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Jennifer F. M. Horne*

THE AVIFAUNA OF AN
UPLAND SEASONAL
WOODLAND IN
CENTRAL KENYA:
ECOLOGY, BEHAVIOR,
BREEDING

BONNER ZOOLOGISCHE MONOGRAPHIEN

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Lester L. Short & Jennifer F. M. Horne

THE AVIFAUNA OF AN UPLAND SEASONAL
WOODLAND IN CENTRAL KENYA:
ECOLOGY, BEHAVIOR, BREEDING



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ABSTRACT

We analyzed the occurrence, movements, ecology, behavior, breeding, and specimen information for birds of upland woodland (1500–2200 m) and adjacent habitats on a 37 200 ha ranch just north of the equator and immediately east of the Rift Valley, on the western edge of the Laikipia Plateau. Over 14.3 years between 1984 and 1999 one or both of us were in the study area for eight years. This is the first avifaunal investigation of Kenyan mid-altitude evergreen/deciduous woodland (partly treated in a broader, more diffuse paper by van Someren 1956). Increasing human population, movement of people into lands marginal for agriculture, and persistent clearing for charcoal, firewood, and cultivation by poorly educated, often impoverished humans in still largely rural Kenya is threatening such woodland, as well as other habitats. The study area is relatively unpopulated, and despite some fires, livestock-grazing, firewood-gathering and other problems, is more or less maintained as a conservation area by the Gallmann Memorial Foundation.

Effects of land use, soil, vegetation, temperature, rainfall, evaporation, and other climatic factors are discussed as background for the studies, which were centered upon 16 major sites; concurrent investigation of honeyguide biology and movements to the widely scattered sites allowed observations of birds in all habitats. Altogether 472 species of birds were seen in the study area, including four threatened globally, and 18 threatened regionally (Bennun & Njoroge 1999, Stattersfield & Capper 2000). New information about their ecology, behavior, and breeding especially are documented. Aerial displays of Tawny Eagles *Aquila rapax* and Gabar Goshawks *Micronisus gabar*, sexually specific songs of Red-faced Sylvieta *Sylvietta whytii*, out-of-range occurrences (e.g., Crested Guineafowl *Guttera pucherani*, Barred Long-tailed Guckoo *Cercococcyx montanus*, African Pygmy Kingfisher *Ceyx pictus*, and others), several records of a large gray shrike *Lanius* spp., upslope (from Lake Baringo area) and downslope (from highlands to the south) movements of sunbirds, finches and others, and sympatric relations of species of francolins, thrushes, babblers, starlings, polymorphism in paradise monarchs, brood parasite-host relations, and others are among the new data presented. Major bird associations and various interspecific flocks occur, and their composition detailed, and 59 well-documented mobbings of predators, mostly aerial, are described with their diverse besiegers listed. Only 43% (c. 200) of species observed were resident at least somewhere on the study area.

Shifts in abundance and location, unexpected movements upslope from drier areas to the west and changes in habitat during the study reflect pressures on woodland and indeed other habitats. Human-induced deterioration seems inexorable in the region. Our studies will be well served if awareness and improving understanding of viable conservation measures result in the retention of the avifauna of at least this western section of the Laikipia Plateau.

Key words: Afrotropical birds, dry evergreen upland woodland/forest birds, central Kenyan highlands, Laikipia Plateau, eastern Rift Valley, deforestation, ecology, behavior, breeding, seasonality, Paleotropical migrants, intra-tropical migrants, rainfall regimes, conservation, threatened birds, waterbirds, bushland birds, *Olea-Croton* woodland birds, acacia woodland birds, Mukutan River birds, overgrazing, riverine woodland birds, *Combretum* woodland birds, mixed-species foraging flocks, mobbing associations.

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ABBREVIATIONS AND SPECIAL WORDS DEFINED

banda	hut or plank walled building, floor often of concrete		as NNE (north-northeast), WSW (west-southwest), etc.
boma	area for livestock at night, walled with thorny branches, often with huts or bandas in the bare enclosure	E, FF	female, females
<i>c.</i>	about	g	gram/s
center	focus of human activity with a house, storage buildings, shops, etc.	h	hour/s
cm	centimeter/s	km	kilometer/s
compass directions	east or eastern (E), north or northern (N), south or southern (S), W or western (W), and combinations of these,	lugga	usually (seasonally) dry streambed
		m	meter/s
		mm	millimeter/s
		M, MM	male, males
		min	minute/s
		pers. obs.	personal observation of the authors (observations of others are credited)

1. INTRODUCTION

Dry tropical woodlands are under severe threat world-wide (Janzen 1988). Where woodlands are dense with closed canopy they are often subsumed in forests, even rain forests (Stotz *et al.* 1996 bypassed the problem by using “forests” exclusively in listing Neotropical

habitats). In East Africa the problem is acute because remaining “forests” are in reserves, parks, and other nominally protected areas, and they include some woodlands, exotic tree plantations and even treeless lands invaded by squatters (Bennun & Njoroge 1999,



FIG. 1. Map of Kenya showing location of the study area (star) east of Lake Baringo. The arrow points to the study area. Latitudes from 4°N to 4°S, and longitudes from 36° to 40° E are indicated at margins of Kenyan borders.

Short & Horne 2001). Only 1–2% of Kenya's indigenous forests remain (Chapman & Chapman 1996, Bennun & Njoroge 1999), and the former authors gave 1.7% annual deforestation in Kenya. Kenya's human population, once increasing at the highest rate

in the world, is still rising considerably despite the widespread effects of AIDS. Increased cultivation of land marginal for agriculture, the illegal occupation and clearing of forest and woodland reserves by settlers, the gifting of supposedly reserved forest and wood-

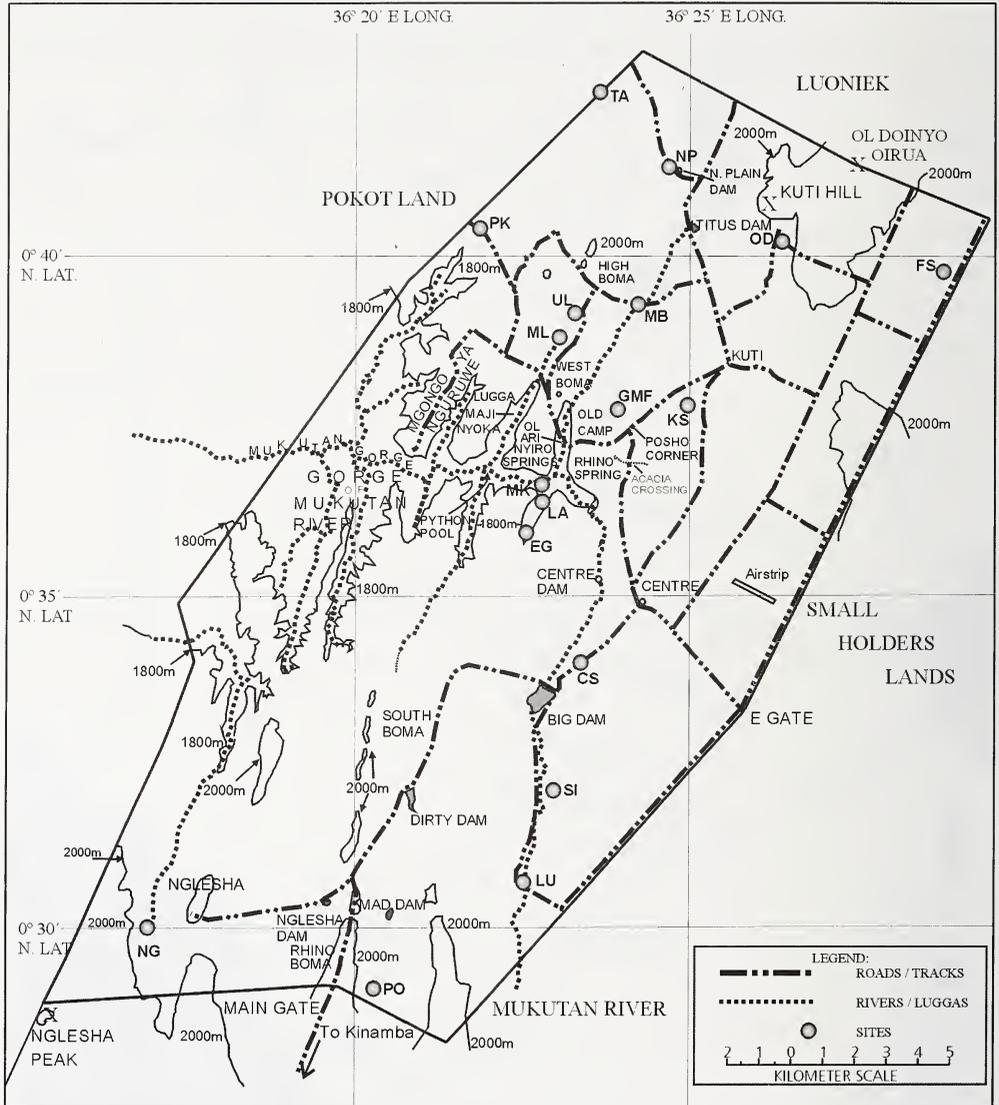


FIG. 2. Map of Olari Nyiro Ranch, the study area, showing various landmarks, and the study sites. See Table 1 for the symbols used here and in the text for the study sites. Elevations at 1800 m and 2000 m are indicated. Latitudes are shown at left margin and longitudes at the top margin. The E one-quarter of the study area may be considered as the start of the Laikipia Plateau that ranges to the E.

TABLE 1. Symbols, elevations, locations and habitats of Ol'ari Nyiro study sites.

Site symbol	Site name	Elevation in meters	Location	Habitats
MK	Mukutan	1737	Central	Riverine Fever Trees; rugged <i>Olea - Euclea</i> slopes
LA	"Lovely Acacia Tree"	1750	Central	250–500 m S of MK, similar, crotons
EG	Elephant Grove	1790	Central	Riverine, springs; <i>Olea - Euclea - Leleshwa</i>
MB	Ol Pongoni	1850	Central	Often dry <i>Croton</i> riverine, with <i>Olea - Euclea</i>
—	Old Camp	1823	Central	Early camp, <i>Croton - Acacia</i> grove in bushland
GMF	Gallman Memorial Foundation Camp, including Honeyguide camp	1890	Central	Leleshwa - <i>Olea - Euclea - Carissa</i> bushland
LU	Lugwagippi	1915	SE	<i>Acacia abyssinica - Croton</i> riverine; bushland
NP	Northern Plain	1853	N	Degraded <i>Acacia gerrardii, Euclea, Rhus</i> bushland
NG	Nglesha	2000	SW	Riverine <i>Acacia abyssinica - Croton</i> with thickets
SI	Sipili	1905	S-central	<i>Acacia abyssinica - Croton</i> riverine; bushland
PK	Pokoti	1840	NW	Often dry <i>Croton - Olea - riverine; Combretum</i> grassland
OD	Ol Doinyo Oirua	1970	E-central	Often dry <i>Croton - Olea - Euclea</i> riverine; slopes
PO	Poromoko	1980	Central-S	<i>Olea - Croton - Euclea - Rhus</i> dense woodland
UL	Upper Maji Nyoka	1865	N-central	Dry stream, slope base <i>Croton - Olea - Euclea</i>
ML	Middle Maji Nyoka	1850	N-central	As last, 900 m S, more degraded
—	Lower Maji Nyoka	c. 1700	Central	Mukutan River, Python Pool; rocky, rugged <i>Olea - Euclea</i> lower end of Maji Nyoka stream
TA	Tabarokwa	1850	N	<i>Acacia - Olea - Euclea</i> woodland, bushland
FS	Francis's Site	1955	NE	Degraded <i>Olea - Croton</i> thickets
CS	Center South	1875	S-central	Dry riverine <i>Croton - Olea - Euphorbia</i> woodland
KS	Kuti Southwest	1855	Central	Dry, drainage, tall <i>Croton - Olea</i> woodland

Note: The sites are shown by their symbols on map Fig. 2. Other elevations are: Main Gate 2010, E Gate 1975, High Boma 1935, Big Dam 1875, Center 1862, Kuti 1880, Nglesha Center 2005, Center Dam 1852, Nglesha Dam 1970, and Python Pool ("Maji Nyoka") 1710.

land to selected people by politicians, and increased clearing of trees of all habitats for firewood and charcoal needed for cooking and heating, have had drastic effects on those habitats (Young & Lindsay 1988, Bennun & Njoroge 1999, Short & Horne 2001).

Our personal experience over 50 years clearly indicates that woodlands outside gazetted forests are disappearing even faster. Within a decade extensive woodland patches between Nanyuki and Nairobi have been eliminated for agriculture and firewood (especially charcoal-making) leaving unviable fragments that are disappearing. In the Laikipia region of highland central Kenya settlement since independence (1963) has removed woodlands in large areas, including the entire Laikipia West area which borders Ol

ari Nyiro Ranch, our study area, on the east side. Overburning for grazing, overgrazing at times, and firewood-gathering have lowered average height of trees, degraded many woodland areas, and caused widespread erosion on that ranch. Nevertheless, the study area "is a valuable remnant of the diverse flora and fauna that once covered vast areas of the Laikipia Plateau and eastern Rift Valley escarpment" (Muasya *et al.* 1994:143, for background see Greenway 1973, White 1983, Taiti 1993).

The initial objective of the project, conducted over 14.3 years (1984–1997), was investigation of the biology of honeyguides (Indicatoridae) of the study area. The work benefited from JH's knowledge of the ranch, owned some years ago by her family's com-

pany; she lived on the ranch for three years during the 1960s. In the 1970s we had access through the kindness of its owner the late Paolo Gallmann. After his death, Mrs. P. Gallmann welcomed our research there and thus we began the studies at a site known as MK along the Mukutan River. We soon realized that we could capture and re-capture not only honeyguides, but many other birds as well. Gradually we expanded the project to include 16 wooded sites scattered about the ranch. Driving to these sites enabled us to visit virtually all major habitats (Figs. 1, 2; Table 1). In addition to capturing birds, observational data were gathered from blinds or other cover, and during drives to and from the various sites. Thus,

the entire ranch became our “study area”, and these two terms are used interchangeably throughout this work.

The study area is significant because of its extensive upland woodlands, low human population, and the occurrence of four Globally-threatened birds, two Near-threatened, and two Vulnerable, all migrants (Bennun & Njoroge 1999, Startersfield & Capper 2000) and 18 Regionally-threatened (six resident) birds, three of which are Endangered, one is Critically endangered, and 14 are Vulnerable, according to Bennun & Njoroge (1999). The area is a conservation center for substantial numbers of large mammals (see Methods and Materials).

2. METHODS AND MATERIALS

During the 14.3 years of the project, with a total of eight years in which one or both of us were in residence, we readily amassed information, much of it unreported, on woodland, riverine woodland, and bushland birds, as well as on large, conspicuous, readily seen birds of prey, waterfowl, bustards, gallinaceous birds, storks, and herons. We also noted observations of conspicuous roadside birds, migrants, and other birds as we traveled to and from our sites. Our data are less complete for secretive, smaller, inconspicuous species of grasslands, and eroded habitats, and those of lower elevations (down to 1330 m) in the Mukutan River Gorge.

We were able to document changes in habitats, both natural and those ascribed to human activities, and their effects on wildlife. Struck by the variation in rainfall within and between years, and associated variation in breeding activities of the avifauna, we compiled appropriate records of these. For most birds our data accumulated gradually during the years of the project. Hence information for each species became more complete with time, and, as our efficiency increased, we have more data for the latter than for the former half of our project. We also traveled much more widely in the area later in the study. This bias means that species observed more frequently earlier than later in the project are likely to have diminished in numbers, whereas those more often seen later on may reflect our greater mobility. A few exceptions occur for local, site-specific birds of early sites visited more often during the first years of the study, e.g., the Stone Partridge. Access to some parts of the study area was difficult at times because of the presence of African elephant *Loxodonta africana*, lion *Panthera leo*, black rhinoceros *Diceros bicornis*, and especially African buffalo *Syncerus caffer*. The presence of these and other mammals impacts upon birdlife, reduces human contact with many locations, and restricted us generally to areas near roads and tracks, i.e., the vicinity of the safety of the vehicle. The general paucity of information available about these birds, and the many, apparently unreported matters of ecology, distribution, behavior, and breeding hopefully justify this report.

In the study area we lived in a camp we constructed, first at the Old Camp east of the Mukutan River, then from late 1986, in the Gallmann Me-

morial Foundation's camp (Fig. 2). At first camp was comprised of tents, but later we built cement-based, thin plank and thatch buildings (bandas). Water was provided, except when very dry, from hilltop tanks, supplemented by drinking water carried into the area by our land-rover vehicle. There was no electricity (items could be charged by power provided at the three centers by generators); we used automobile batteries for lights to write and read, and, mainly kerosene lamps at night. We carried in petrol in five-gallon cans; sometimes we could purchase petrol at the main Ranch Center, but usually petrol and other supplies had to be obtained in the nearest town, Kinamba, 40 km from camp. Urgent auto repairs to our vehicle could be made at the Center if a mechanic was available, and at cost, although parts had to be carried in by us. The nearest doctor was in Kinamba. For dire medical emergencies we relied upon hiring personal airplanes of the Ranch Manager to fly us to hospitals in Nanyuki, or Nairobi. Binoculars, radios, field equipment, field clothing, etc. were provided by us for ourselves and our various assistants. Our experience (JH a lifetime in Kenya, much of it in the field, and LS field work in Kenya yearly since 1976) enabled us to cope with problems caused by humans, animals, machines, disease, and weather.

The English and scientific names used for mammals follow Kingdon (1997), those for reptiles follow Spawls *et al.* (2002), and those for plants follow Beentje (1994); note that English names of plants are not standardized, and Beentje (1994) provides relatively few of such (some in use are those of the lumbering trade).

In Kenya as noted in the Introduction, woodlands as well as forests certainly are disappearing at a great rate. This impression is based upon our long and intimate involvement in research all over Kenya. Indeed, forests have decreased to only 1–2% of their former occurrence in Kenya, and are now at c. 1 000 000 ha, with a loss of at least 1% per year (Bennun & Njoroge 1999). Degradation of habitats and desertification are affecting all parts of Kenya. Our study area is significant, particularly because the woodlands it contains are still extensive, its human population is small, and the area holds substantial numbers of large mammals.

3. THE STUDY AREA

Olari Nyiro Ranch. This is 37 200 ha of land located on the W edge of the Laikipia Plateau. Shaped in the form of a rectangle of 27x14 km, its long axis is SW-NE; it lies between longitudes 36°16' and 36°29' E, and latitudes 0°28' to 0°43' N (see maps, Figs. 1, 2). A slight ridge runs N-S along the central-E border; it rises into a hilly mass in the NE, with a peak of 2140 m (Ol Doinyo Oirua). Otherwise the land slopes downward from the S and E to the N and W. Its highest point is at c. 2200 m on the N slope of Nglesha Hill, the peak of which is S of the study area at 2247 m. The escarpment of the E Rift Valley descends from Nglesha northward, then rises to Kurmakine Hill (2049 m), drops into the Mukutan Gorge, rises sharply to the Mgongo ya Nguruwe, is then undulating to the N and E, with a high point above High Boma at 2027 m, and finally slopes gradually downward to the N and W. The lowest elevation of the study area lies at c. 1330 m, along the W boundary in the Mukutan Gorge. The Mukutan River flows from hills to the SE, enters the study area, passes into the center of the study area, then swings W down into the Gorge, the walls of which are often sheer, especially in the N, where rock faces may be as great as 450 m. In addition to the Mukutan's tributaries that flow in wetter periods, there are various springs, including Ol ari Nyiro Springs, that maintain a year-round flow of that river from Center Dam to the N and W. The drainage of the Mukutan River, the downward slope of the Laikipia Plateau from E to W, and the Rift Valley's E escarpment (Laikipia Escarpment) along the W edge of the area, fashion the land forms and habitats of the study area. Virtually the entire ranch, except for a tiny segment in the NE (where streams flow E and N into the Northern Ewaso Nyiro or Uaso Nyiro River, and then into the Tana River), drains directly or indirectly (far NW) into the Mukutan River. This river and its various tributaries have c. 35 dams that are constantly under repair, or replacement. The dams, springs, and river are important to the distribution of diverse animals and plants.

Roads and tracks (Fig. 2) connect the various centers, the N border gate, a gate along the E border and the Main Gate along the S border, as well as passing to the dams, temporary and permanent livestock bomas, airstrips, lodges, a few scenic sites and security camps. All of these are subject to flooding and erosion. Even main roads are impassable during and after heavy rains; many tracks are passable only with 4-wheel-drive vehicles when not flooded.

Land use, topography, geology, soils, and vegetation. The area has been used by agriculturists and pastoralists for centuries, most recently by the Maasai, who grazed cattle and other livestock, likely burning some sections to afford more grazing land. As the result of an intra-tribal battle, apparently between 1870 and 1890, the area was depopulated (ole Sankan 1971, Mol 1996). This allowed European colonists to move in readily and establish large ranches during 1905–1930. More burning, and clearing, and dam-building took place. After Kenyan independence in 1963, the government claimed some of the ranches and split them into small-holding farms; the areas involved were more extensively cleared and burned, and more dams were constructed to provide water for households, livestock and cultivation. Dams on the large-holding ranches today mainly provide water for livestock, and game, and are limited in use for cultivation of gardens and crops. Farming in the Laikipia region is essentially rain-dependent, as most of the Plateau receives insufficient rainfall too irregular to sustain cultivation of crops; the frequency of low-rainfall years with less than c. 750 mm per annum is too great (Berger 1989).

There has been continued movement of settlers onto the Laikipia Plateau, particularly along its S edge, as more fertile parts of Kenya have become heavily populated. Cultivation of marginal land, with the needs of the increasing population for water and firewood has hastened erosion there.

Currently W of the study area is a Pokot tribal district used predominantly for livestock, with scattered small communities and shambas (gardens). To the E and S of the study area are small-to medium-sized farms with only traces of natural woodland and bushland. Luoniek, the property to the N, a former ranch with considerable ecological diversity and some more or less natural habitat, has an uncertain future. There is considerable pressure on wildlife and their habitats just E and S of the study area, if there are no immediate threats to the W and N.

Through the 1960s and into the 1970s more extensive woodlands have been degraded, with larger trees fewer, becoming bushland. Fires set by ranch personnel in the late 1980s degraded some woodland including riverine woods, opening them up, and adversely affecting the surrounding bushland. An increase in grazing livestock and their concentration, with large game mammals near water, have contributed to the local degradation of habitats, as have the regular removal of dead, standing and recently fallen



FIG. 3. The acacia crossing in flood 10 May 1985. Horne is at left, on the road that connects GMF with Center. Note the muddy water; woodland is of *Acacia gerrardii*, with *Euclea* spp. This is the site of long-lasting but temporary pond after heavy rains. Photo to NE from S of crossing.

trees (thus depriving the soil of their nutrients), sporadic charcoal-making activities, and the clearing of some places dominated by *Tarchonanthus camphoratus* for production of leleshwa oil. Leleshwa bushes and trees, when cut to the ground, regrow slowly; the humus around them washes away, surrounding bushland habitat is disrupted and most wildlife is adversely affected. Coppicing leleshwa for firewood has been attempted (Kennedy 1998). Bushland adjacent to cutover areas is opened up, and its edges are degraded, with negative effects upon it and its wildlife. Overstocking, burning and selective removal of trees, with various constructions of hides, boats, and private and tourist lodges, have caused deterioration of the Mukutan's riverine woods; remaining trees have attracted the attention of elephants that push them over to eat leaves and bark, and of honeyhunters, who carve out bee-hives, weakening the trees. Areas once heavily covered with bushland woodland, particularly about Kuti, have been degraded, exposing extensive bare soil. Heavy rains now cause widespread flash

floods with sheet erosion of topsoil that washes away (Fig. 3), and silts up the dams (see accounts of White-backed Duck and Red-knobbed Coot).

Geology, soils. Describing the vegetation of the ranch, Muasya *et al.* (1994) treated its geology and soils. Miocene to Recent deposition, uplift and volcanic activity have occurred. Many N-S fault lines are sites of seeps and springs. The soils have resulted from active erosion and volcanic activity associated with the evolution of the Rift Valley and emergent Nyandarua Mountains and Mt. Kenya over the past 25–30 million years (Taiti 1992, Schulz & Powys 1998).

Vegetation. In their analysis of the vegetation of Ol'ari Nyiro and the Mukutan Gorge, Muasya *et al.* (1994) estimated the occurrence of 800 species of plants. This indicates an unusual floral diversity for a non-forest area of Kenya. They described 16 plant associations of the study area, and discussed 10 key plants, as well as providing a check-list of the vegetation. For ornithology

thologists their plant associations are somewhat too finely split to be useful. Taiti (1992) treated six communities of vegetation of the Laikipia area: upland/riverine forest; *Themeda-Pennisetum* grassland; *Carrisa-Rhus-Euclea* leafy bushland; *Tarchoanthus-Rhus* leafy bushland; bare rocky areas with sparse vegetation, and cropland.

For avifaunal purposes we classify habitats of the study area as follows (see also Table 1). Open habitats include: the bare rocky areas, water and water edges, cropland, including stages of cultivation, ploughed fields, and post-harvest cultivation; gardens and lawns, as the "oases" at Kuti, Center and Nglesha, and bare ground, usually associated with habitation, cattle dips, bomas, heavily used areas about tanks and dams where livestock and large wild mammals congregate, and very degraded land (worn-out pastures, some roads, portions of airstrips). There are grassland and pasture habitats such as the short grass of the three airstrips, the pasture maintained N of the Main Gate, smaller pastures near the centers (Fig. 4) and a few fire-en-

forced grasslands. There are also various, semi-open microhabitats such as: urine-sated, recently abandoned bomas; the rubbish tip or dump that often contains carcasses; sporadically wet rock pools and roadside drainage areas, and salt or mineral sources where some mammals and birds obtain apparently needed nutrients.

Among bushland/scrubland habitats are various *Acacia brevispica* (called "wait-a-bit") and *Croton dichogamus* areas; these are usually either degraded bushland remnants on relatively flat ground, or steep-slope scrub that seems in part fire-dependent, and affected by loss of topsoil and compaction. Much of the bushland may once have been upland olive *Olea europaea* woodland degraded through repeated burning (one frequently finds remnant olive stubs and roots amid bushland). The bushland S of the Mukutan River is dominated by leleshwa *Tarchoanthus camphoratus* (Fig. 5), which occurs N of the river only as far as UL and MB. This sometimes is in almost monotypic stands away from streams. Leleshwa wood is used for



FIG. 4. Pastures and sometimes cultivated fields just W of Nglesha Center in rain 17 July 1994. View to N, note isolated large *Combretum molle*, marking former *Combretum* wooded grasslands. Track across center of photo leads left to Nglesha crossing and the NG site.



FIG. 5. Leleshwa-*Euclea-Acacia gerrardi-Rhus* bushland, degraded in part, at right, meeting *Acacia abyssinica-Croton* riverine woodland (left) near Sipili (SI) 29 December 1991. Here one meets a rich mixture of bushland and woodland birds and mammals. View to NW.



FIG. 6. *Combretum* wooded grassland slope with thickets of *Carissa-Euclea-Rhus-Rutya* 2 September 1987, on slope above the Lugga Maji Nyoka site UL. Most *Combretum* trees are *C. molle*, the roots of which are favored by elephants as food. Habitat of various cisticolas, larks, serins, sunbirds, and others.



FIG. 7. Degraded, pastured *Acacia gerrardii* open bushland (once woodland), at NP, with *Euclea* spp., *Rhus* spp., and such plants of disturbed areas as *Lantana camara* and *Datura stramonius*, looking E toward Kuti Hill (center background), 22 September 1986. Note elephant damage to the acacias. Dry woodland birds such as Brubru, Abyssinian Scimitarbill, Yellow-bellied Eremomela, and breeding lapwings, Three-banded Coursers and whydahs occur here.



FIG. 8. View NW toward Tabarokwa Hill (right background), site TA, in degraded *Acacia gerrardii* bushland, 15 July 1993. The lone tall acacia was situated in an abandoned camel boma; a Scaly-throated Honeyguide sang from it. *Acacia brevispica*, *Euclea* spp., *Rhus* spp., and a few *Olea* sp. occur. Go-away-birds, barbets, estrildine finches, scrub-robins, various bush-shrikes, and other birds are common.

firewood and charcoal-making, as well as for cosmetic purposes; its cottony fruit-covering (pappus) is much used by birds as nest-lining material. Species of *Euclea*, *Rhus*, and *Carissa* are common, often variably dominant bushland plants, flowers and fruits of which provide food for many birds; the former two are favored for nesting and roosting.

Combretum wooded bushland/grassland with mixtures of *Euclea*, *Carissa*, and other shrubs and small trees is characteristic of the upper slopes in the W of the area (Fig. 6). *Combretum molle* survives fire well, but unfortunately is knocked over and its roots dug up by elephants that apparently seek nutrients therein (Muasya *et al.* 1994).

Acacia gerrardii-*Euclea* woodland, degraded woodland or bushland (Figs. 7, 8; with such associates as *Carissa edulis*, *Croton dichogamus*, and *Acacia brevi-*

spica) occurs in alluvial soils in the center of the ranch to the N border. Once thick woodland, overgrazing, fires, and firewood-gathering have resulted in degradation, with remaining larger acacias subject to knock-downs by elephants. This resulted in fewer large trees and lowered overall height of the vegetation. Some birds such as the Abyssinian Scimitarbill, Brubru, and Yellow-bellied Eremomela are largely or entirely restricted to these habitats.

Riverine woodland is dominated by *Acacia xanthophloea* at lower elevations (Figs. 9, 10) and *A. abyssinica* (Figs. 11, 12) at higher elevations; *Croton* spp., olive, *Rhus* spp., *Euclea* spp., and *Euphorbia* spp. occur with both. This habitat is restricted but critical to biodiversity; mammals and birds utilize these trees for breeding, foraging, hiding places, and corridors of movement. The deep-gorge woodland relatively in-



FIG. 9. View down upon the MK from top of hill to E, 3 November 1985. The Mukutan River flows beneath the fallen acacia tree in the center of the photo (below the two tall fever trees), around the rocky knoll (behind the same two trees) and on W and S into the background valley; the Mgongo ya Nguruwe (hogsback ridge) in the right background drops into the Gorge in the center background. *Acacia xanthophloea* riverine woodland with much *Rhus natalensis*, and *Euclea divinorum*, bordered on surrounding rocky slopes by leshwa-olive-*Euclea* bushland and bushland. The grassy open area is grazed by livestock, buffaloes and zebras, and a baboon troop is headquartered here. Many woodland and rocky area birds such as Stone Partridge occur here with birds of the river's edge (e.g., Green-backed Heron, Giant Kingfisher, shorebirds).

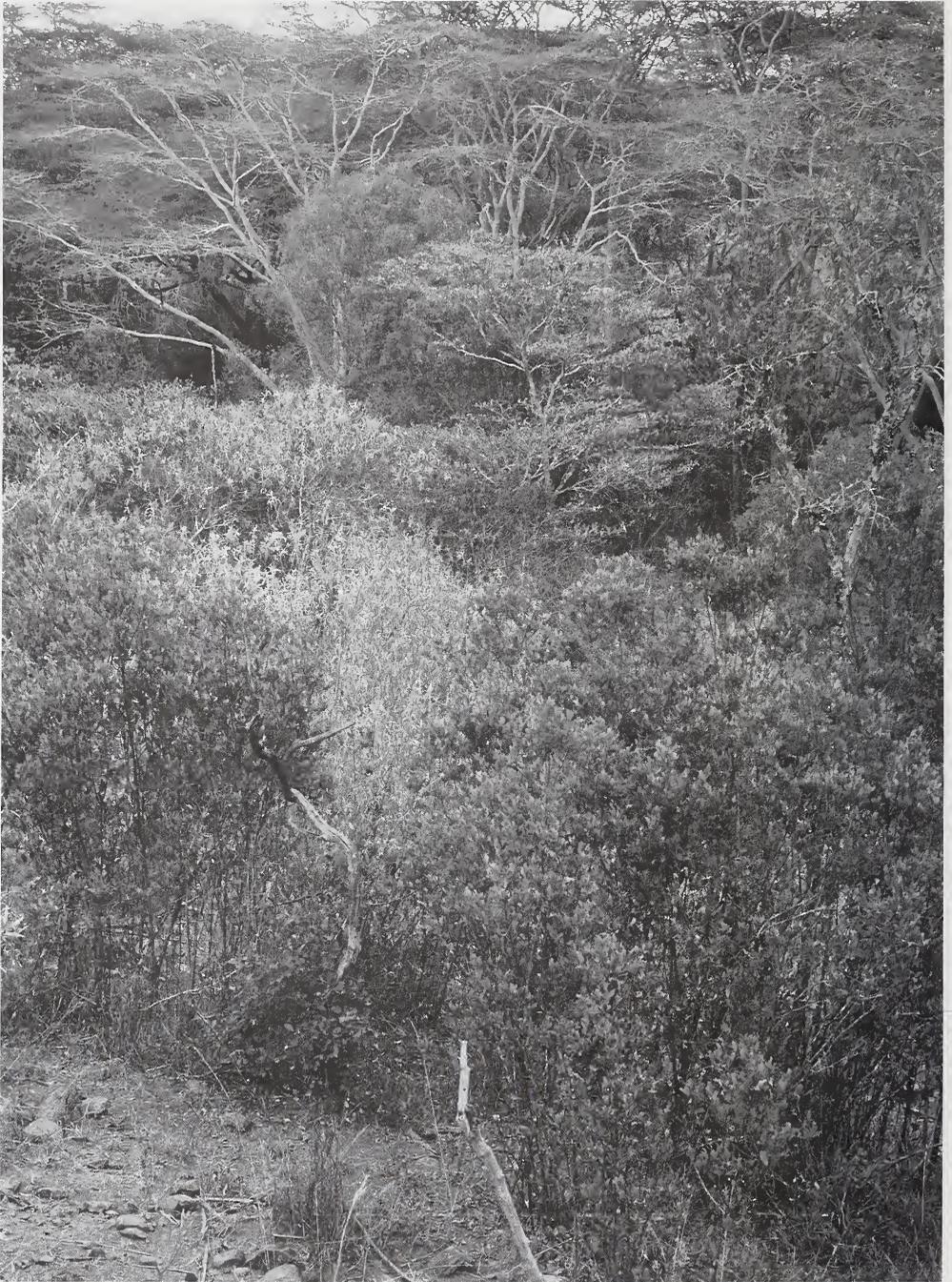


FIG. 10. Looking W into the Elephant Grove (EG) and its riverine *Acacia xanthophloea* woodland, from slope leleshwa-olive-*Euclea-Rhus* bushland, 14 January 1992. A baboon troop roosts here, and elephants, elands, buffaloes, and other mammals commonly occur. Many woodland birds are found here, including both helmetshrikes, *Melaenornis* spp., Gabar Goshawks; and African Little Sparrowhawk and Tawny Eagles nested here regularly.



FIG. 11. Acacia-dominated (*Acacia abyssinica*) riverine woodland with *Croton* spp., *Apodytes* sp., *Rhus* spp., and others, looking NW, at SI, 19 December 1993. Note the elephant-bashed acacias and degradation caused by livestock and large mammals that feed and seek shelter herein. This was a main honeyguide netting area, with many woodpecker holes and thus honeybee hives in trees. This photo, in a dry period, is just N of Fig. 12.



FIG. 12. Sipili site S of area of Fig. 11, in tall *Croton-Acacia abyssinica* riverine woodland, wet season 21 June 1991. The bent-stemmed, huge acacia in the center held a bee-hive very high in the trunk that was occupied off-and-on by honeybees and four species of cavity-nesting birds over 13 years. Brown Parrots, Lilac-breasted Rollers, and Mosque Swallows were some secondary cavity nesters here. It was a favorite site for all large woodland/forest mammals.



FIG. 13. Walls of Mukutan Gorge below the Maji Nyoka (Python Pool, Fig. 2), with palms *Phoenix reclinata*, fever trees, *Croton* spp., *Albizia* sp., *Ficus* spp., *Strychnos* spp., and others among riverine trees, and slope vegetation (*Acacia brevispica*, leleshwa, *Euphorbia* spp., *Cussonia holstii*, *Commiphora habessinica*, *Olea* sp., and others) on rocky areas, 3 June 1992. The view is to the W-SW, Lake Baringo lying beyond the walls at right of the photo. The Pallid Honeyguide, diverse sunbirds, Hemprich's Hornbills, swifts, red-winged starlings, and other birds are found here; movement of birds of lower elevations upriver from the Lake Baringo region and of upland birds, fish-eagles, swallows, and bee-eaters among them, downriver through here.



FIG. 14. *Croton-Euphorbia-Acacia abyssinica* woodland alongside Lugwagippe Dam at LU site, 31 July 1989. Much leleshwa, *Rhus* spp., *Euclea* spp., olive, and other plants are common in the often dense bushland and thickets bordering the riverine woods. Fish-eagles nest here and other birds of prey are often seen, as well as many other birds, e.g., cormorants, darters, pigeons, and woodpeckers.

accessible to us now has a tourist lodge adjacent to it (Fig. 13). The Gorge vegetation is a corridor for up-slope-wandering birds from the Lake Baringo lowlands and for downslope wanderers to that lake area, as well as for local resident birds. *Euphorbia candelabrum* is often subdominant (Fig. 14) along the upper Mukutan. About Nglesha *Acacia abyssinica* occurs on slopes away from stream channels (Fig. 15). In the E and part of the S, the crotons and olives form woodlands along luggas and about the S border (Fig. 16). For various aspects of vegetation of the area see White (1983), Beentje (1994), Muasya *et al.* (1994) and Mutangah & Agnew (1996); for succulent plants see Schulz & Powys (1998).

Climatic background: temperature, rainfall and water.

The study area has a highland tropical climate with a mean annual temperature of 16–20°C, decreasing with increasing altitude, and a variable annual rainfall of 400–750 mm, increasing markedly above 2000 m. The elevation generally ranges between 1600 and 2200 m. For a climatic comparison of this area with other parts of Kenya, see Bennun & Njoroge (1999). Rainfall is determined within our Inter-tropical Convergence Zone (ITCZ) by the NE and SE trade winds, and, in July–August by W winds affecting the middle tropospheric level. In April–May the SE trade winds occur off the Indian Ocean, and usually bring significant rains. During July–August the middle tropospheric W winds bring rainfall out of the Congo region, rains being regular and diminishing in amount from W to E. As the ITCZ moves back S to a point just to our N, the SE trade winds again bring rainfall, usually in lesser amounts, in October–November. Finally, the ITCZ shifts to the S of us, allowing domination by the NE trade winds that move into Kenya from the Horn of Africa, causing dry conditions. The location of the study area at the E edge of the Rift Valley, with steep topography, causes convection currents, and augmented rainfall (Ogallo 1993).

Temperature. As Brown & Britton (1980) suggested, the climatic effects of temperature in equatorial regions (the study area is within 1° latitude of the equator) are closely related to elevation, with an average drop of 1°C in temperature for every increase of 300 m in altitude. Increased rainfall, increased humidity, and decreased evaporation (yielding greater available soil moisture) occur as altitude rises. Freezing is a direct effect of temperature; we recorded no freezing

temperature in more than 14 years of the project, our lowest reading being 3.75°C at MB 21 June 1989 (Olari Nyiro Ranch has not maintained long-term temperature records). Berger (1989) noted that frost might occur in exposed depressions above *c.* 2100 m on the Laikipia Plateau. He reported an absolute minimum temperature of –0.6° at Rumuruti, near the center of the plateau at 1860 m during December–January. Muasya *et al.* (1994) estimated yearly maximum and minimum mean temperatures respectively at 30°C and 14°C for the study area (the latter seems too high to us). The highest temperature we noted was 32.2°C 15 March 1985. Temperatures above 30°C can occur in September and December–March, and rarely in other months (being almost on the equator, the sun feels searingly hot when out during 09:30–17:00 h). These were recorded at our camps (1823–1890 m). Likely temperatures reach higher, probably to 35°C in degraded areas, as between Main Center and Kuti, and Kuti and NP.

Berger (1989) observed that Laikipia temperature variation during the year is low whereas the daily range is great. The daily range in the study area can reach or exceed 20°C during January–March, and we have had daily ranges to 21–22°C in June–July. Such amplitude ranges also are known at the E end of the Laikipia Plateau (Nanyuki, pers. obs., Berger 1989).

Rainfall. A “met” station with rainfall recorded has been maintained at Center since 1953. More recently, rainfall records were kept at Nglesha Center and at Kuti, and while present in the study area during 1984–1999 we noted rainfall, relative humidity and temperatures in our camp. Records other than those from Main Center were, however, incomplete, due to the illness or leave of key staff, resulting in irregular gaps. Our discussion is based mainly upon the long-term records for Main Center, located near the geographical center of the ranch and study area (Fig. 2). Table 2 provides rainfall totals from there over 46 years.

Although potentially there are three rainy seasons characterizing the Laikipia region (Brown & Britton 1980; see this for comparisons with other parts of East Africa), rainfall is irregular and very variable. Two of the three rainy seasons may fail, while wet years can provide rainfall in all months. The wettest year's rainfall may exceed that of the driest year's by up to 388%, with higher values (to 432%; Schulz & Powys 1998) in the drier N of the Plateau, and 400% about Nanyuki in the SE (pers. obs.). Much rain falls in brief thunderstorms; and the wettest months may have



FIG. 15. Nglesha site with dense thickets of *Rhus* spp., *Euclea* spp., *Croton* spp., *Carissa* sp., *Olea* sp., and others, 30 May 1992. Habitat of Crested Guineafowl, Scaly Francolin, Eastern Bronze-naped Pigeon, Barred Long-tailed Cuckoo, White-headed Wood-hoopoe, Spot-flanked Barbet, Tullberg's Woodpecker, Purple-throated Cuckooshrike, Montane White-eye, Grosbeak-serin, and other upland woodland and forest birds. The stream is to the right; the center background tree is *Acacia abyssinica*.



FIG. 16. Main PO site in dense *Croton-Olea* woodland with *Euclea* spp., *Rhus* spp., *Apodytes* sp., and other plants, 4 January 1990. We had to bear arms here, as buffaloes and elephants often approached us and the nets closely. Gray Woodpeckers, wood-hoopoes, starlings, and other hole-nesters were present in numbers, as were Olive Pigeons in some years. A smoky fire to attract honeyguides and deter large mammals is in the center-right background, between two large tree trunks. Stephen Njagi is at left.

TABLE 2. Monthly and yearly rainfall in millimeters over 46 years at Center, Ol'ari Nyiro.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1953	13.2	0.0	0.0	114.6	44.7	105.2	22.9	72.6	26.4	56.6	31.5	0.0	474.5
1954	1.0	0.0	0.0	114.3	152.4	118.4	163.8	105.7	66.0	9.1	14.2	1.5	745.4
1955	3.3	45.2	0.0	157.0	28.9	36.8	78.2	132.8	71.6	49.0	50.5	33.5	683.5
1956	2.9	17.5	54.1	127.5	106.4	55.6	107.7	170.2	69.9	16.3	16.3	3.8	748.2
1957	36.8	1.5	53.3	120.0	163.8	122.2	38.0	111.3	5.6	16.0	60.7	65.3	757.7
1958	54.9	105.9	65.5	62.2	174.8	119.6	245.9	67.8	78.7	20.6	4.6	104.1	1049.7
1959	15.0	30.0	69.1	70.4	171.5	57.2	79.0	54.9	57.4	6.1	66.3	16.8	678.7
1960	14.2	8.9	65.0	61.0	66.0	47.8	169.2	155.7	43.9	9.4	32.5	1.3	660.7
1961	3.8	2.8	2.5	51.3	41.7	57.7	135.4	240.5	72.6	95.0	270.5	114.3	1084.3
1962	23.1	14.0	12.4	78.2	138.4	65.8	80.0	88.1	53.6	20.1	32.3	36.1	619.0
1963	120.7	93.7	126.0	279.7	154.2	8.6	33.0	178.1	7.1	12.4	51.1	258.1	1322.0
1964	1.8	38.9	24.6	120.4	98.8	40.6	112.5	236.5	128.5	9.7	9.4	28.2	848.1
1965	93.2	4.3	0.0	114.6	69.6	25.7	19.8	50.3	41.4	34.0	80.8	20.6	461.1
1966	10.7	73.4	2.0	265.9	15.7	54.6	112.8	232.9	91.9	117.5	28.4	8.4	1003.5
1967	0.0	2.0	34.5	104.4	311.7	83.1	132.8	159.3	3.0	44.5	158.2	5.8	1039.3
1968	0.0	140.5	73.9	234.4	58.4	79.8	120.7	63.8	8.6	31.5	99.3	23.4	934.3
1969	53.6	16.8	105.2	0.0	220.5	52.1	23.6	108.2	137.7	26.4	53.6	0.0	744.1
1970	73.4	11.4	84.6	61.5	148.8	87.6	65.0	88.9	50.0	24.6	7.6	5.1	635.1
1971	9.9	0.0	5.8	40.9	125.2	149.9	114.3	178.8	39.6	117.5	11.2	117.1	900.3
1972	4.3	108.7	6.6	16.5	124.0	108.2	44.2	65.3	44.2	94.5	54.7	22.9	689.8
1973	80.8	27.9	0.0	17.3	47.2	27.7	108.7	165.0	54.9	18.5	18.0	5.1	490.3
1974	0.0	5.6	116.6	114.3	106.7	55.9	115.6	116.8	39.6	32.8	11.2	5.1	720.2
1975	0.0	0.0	6.4	147.3	135.9	168.9	113.8	238.5	163.3	133.9	22.6	12.7	1143.3
1976	1.3	0.0	0.0	33.8	142.7	46.1	176.3	98.8	36.8	0.0	48.8	2.5	585.8
1977	20.8	7.6	5.6	212.9	172.0	88.4	79.2	63.5	35.6	133.6	186.7	17.8	1002.9
1978	57.2	41.1	54.6	11.4	114.0	32.0	60.7	71.6	56.9	40.6	18.3	15.7	516.9
1979	129.3	45.0	90.7	46.5	25.9	24.1	46.0	57.4	71.6	33.0	45.7	9.9	625.0
1980	24.9	0.0	15.5	105.4	190.8	55.6	7.4	7.6	5.6	0.0	43.4	0.0	431.3
1981	0.0	0.0	164.6	358.9	117.9	58.7	122.2	157.5	79.0	0.0	0.0	0.0	1058.8
1982	0.0	0.0	6.4	112.8	312.4	44.5	22.1	68.6	38.0	57.2	116.8	63.5	842.3
1983	0.0	115.3	0.0	53.8	104.6	124.0	70.9	132.3	61.0	69.9	45.7	40.6	818.1
1984	0.0	0.0	0.0	36.1	0.0	0.0	92.5	47.8	44.5	25.4	36.6	58.2	341.1
1985	0.0	22.6	29.0	157.7	205.5	62.5	55.1	30.2	83.8	8.1	31.8	0.0	686.3
1986	0.0	0.0	1.5	224.3	31.0	246.4	75.4	70.5	53.8	7.6	25.4	43.7	779.6
1987	12.4	5.1	12.4	123.4	198.4	108.0	12.2	64.0	0.0	15.2	135.4	0.0	674.1
1988	17.0	0.0	8.6	321.3	62.7	75.7	265.9	191.8	115.3	6.4	16.8	22.6	1087.1
1989	2.0	45.7	176.3	110.5	101.6	37.6	130.0	86.1	50.8	62.2	97.0	31.5	929.3
1990	17.8	81.0	52.8	136.7	42.2	27.2	68.1	97.5	29.7	84.1	0.0	24.1	643.4
1991	10.7	1.0	31.0	23.1	162.3	106.2	69.3	120.1	28.4	49.0	0.0	13.7	604.1
1992	9.9	2.0	35.6	118.1	50.8	48.0	101.3	81.3	43.7	78.7	10.7	28.7	598.9
1993	138.2	30.2	0.0	7.6	141.7	66.0	66.8	29.2	13.5	5.8	13.7	2.4	515.1
1994	0.0	10.0	34.0	196.0	179.0	40.5	98.5	86.5	22.0	80.7	129.0	13.0	889.2
1995	3.5	38.5	40.5	73.0	84.0	85.0	135.0	53.5	50.0	29.5	42.0	16.5	647.5
1996	5.0	62.0	50.5	18.5	129.5	217.5	241.0	102.5	19.0	6.5	62.0	12.0	921.0
1997	6.0	0.0	36.0	256.0	90.5	72.5	209.0	75.5	0.0	68.5	143.5	17.5	969.0
1998	116.0	9.0	4.5	75.0	170.0	98.0	120.5	117.0	7.5	106.0	31.5	0.0	739.0
Mean	25.8	27.5	38.2	114.9	120.3	76.0	99.2	108.5	50.0	42.7	53.6	28.8	759.8

50% to 75% of their days dry (Schulz & Powys 1998). Unusually, as near Nanyuki in October–November 2001, rain can fall daily for as many as 28 consecutive days. The variability of the rains is so great that the amount of rainfall is likely less important than its intensity and sequence. On the plateau rain locally can fall in amounts up to 47 mm in 21 min (16 May 1994 in the study area) and up to 150 mm may fall in one day (Colcheccio Ranch in the N-central Plateau, Schulz & Powys 1998).

Rainfall generally is concentrated in: the big rains of April–May, occasionally March or rarely February to as late as June; the continental July–August rains (occurring sometimes from June to September), and the little rains of October–November, often mainly in November, but unusually from September to December or rarely January (Griffiths 1958). The big rains are also known as the “long” rains although the season is usually no longer than that of the July–August rains, and the little rains are also known as the “short” rains. The big rains plus the July–August rains provide the bulk of the year’s rainfall (see also Map 2, Berger 1989, and Fig. 6, Muasya *et al.* 1994). The big rains are the heavier, but less regular than are the July–August rains, which virtually never fail (July and August are the only two months with rainfall in all of 46 consecutive years), and are known locally as the “dam-filling rains.” In some years the little rains were substantial although at their greatest they rarely approach in amount the rainfall of either of the other two rainy seasons. The significance of the little rains is that they usually provide a wetter break after often drier September, and before the normally long dry season of December–March. Following the little rains often cloudless skies and strong winds occur, persisting until March. When the July–August rains are not substantial, and the little rains are weak, a dry, windy drought may obtain from September to March. Overall, some 90% of the year’s rainfall (66–100%) occurred within the three rainy seasons during the 15 years covering our 1984–1998 field seasons (see Berger 1989, Ogallo 1993).

In 1959–1968 rains were well above average for the study area, at 881 mm. During the 14 full calendar years of our studies the first five years (1985–1989) averaged 838 mm of rain yearly, the last five years (1994–1998) had a mean of 859 mm, but the middle four years (1990–1993) showed only 600 mm per year. Rainfall extremes at Center for 14 full years of the studies were 515 and 1104 mm; 1984 had a mean

of 341 mm, the lowest rainfall for any of the 46 years – the studies began in a drought year. The rainiest month per year was April or May in 31 years, July or August in 12 years and, in the other three years, January, March, and June. The 552 months of 46 years included 74 with less than 5 mm of rainfall (50 of these had no measurable rain); of these essentially rainless 74 months, 60 fell in December–March. Regardless of the seasonality of rains, rainfall was more likely during April–November than December–March.

Discontinuities in rainfall are significant for the vegetation and wildlife, and may account for local movements of birds and mammals. The occurrence of sunny days between the usually irregularly occurring rains of a rainy season is important because of evapotranspiration (see below), which lessens the positive effects of the moisture, lowering humidity as it does.

Rainfall usually is heaviest and more frequent in the SW of the study area, decreasing to the N and E. A given storm may drop 20 mm at Center, a few drops on GME; 45 mm in the Mukutan Gorge, and 70 mm at Nglesha. Proximity to the Rift Valley, an irregular topography, and a highland tongue from Nyahururu N to the Mukutan Gorge are responsible for greater rainfall in the study area than elsewhere on the Laikipia Plateau (Berger 1989); the SW of the study area averages 200 mm or more rainfall annually then locations on the Plateau to the E.

Humidity. Humidity affects the evaporation rate and the presence of dew, a potentially important source of water for small birds. Relative humidity is high at night; it decreases rapidly over the course of a morning, if there is sunshine and it has not rained recently. Frequent rains and cloudiness associated with rains slow or halt the drop in humidity. During, and the morning following a rain the relative humidity may be 90–100%. During sunny days September–March, if there has been no recent rain, the relative humidity may drop to 40, 30 or even 20% by mid- or late afternoon. Clouds lessen the evaporation rate, which is high when sunny, especially given the altitude and latitude. Except during and following rains, humidity tends to be low, usually at 70–85% at night and dropping to 50% or less during the day. Rarely does the humidity remain very high or very low for more than a day or two (Schulz & Powys 1998). The winds in dry periods also lower the humidity and hasten evaporation of dew.

Evaporation and water availability. The rate of evapotranspiration is relatively high due to the high elevation and low latitude of the study area. Below 2200 m, i.e., in essentially all of the study area, evapotranspiration exceeds precipitation in this region (Liniger *et al.* 1998). Cloudiness in the rainy seasons tends to extend water availability. After extensive heavy rains the shallow luggas, small springs and low sumps, retain water (the acacia crossing, Fig. 3, has a flow of water for months after heavy rains). The many dams provide water and locally lower evaporation. Often a low cloud-fog-mist rolls in from the higher plateau to the SE, particularly in April–September and November–January. It sometimes spreads over the entire area to ground level, and may last much of the morning, condensing on rocks and vegetation, increasing humidity, decreasing evaporation, and providing much useful water to the biota. In clear weather the intense radiation of the sun dries up surface water. During extended sunny periods the vegetation and soil become parched; in droughts smaller dams dry up, and in longer droughts water is essentially removed by evaporation from all dams except Big Dam, with flowing water in the Mukutan only upstream to Ol ari Nyiro Springs.

Declination of the sun. Direct sunlight is strong; the sun is exactly overhead only twice a year, at the March and September equinoxes. The significant shift in position of the sun frequently required us to shift our solar panels. Shifts in the earth's tilt towards the sun cause the sun to appear to move N of the equator after the March equinox, to 23.5° latitude N in June, then course back to the S, reaching 23.5° latitude S in December, overall a 47° shift in the direction of sunrise and sunset. The apparent shifts are likely obvious to other animals and can provide (directly and through polarizing of light), visual cues for navigation by migrant equatorial birds (Able 1999, Berthold 2001).

The study sites. Place names in Kiswahili, Maasai (the people of God, Maa, therefore “Maasai,” not “Masai”), and other tribal languages, may be spelled variously. Localities may have two names, such as the town nearest our study area, officially designated, mapped and signposted “Ndindika,” but otherwise known universally as “Kinamba.” Our first study site was on the Mukutan River, called the Mukutan site (MK, see Map, Fig. 1); “Mukutan” derived from “Mkutano,” meaning “confluence” and spelled diversely for various

Kenyan streams. We use “Mukutan.” “Ol ari Nyiro” probably should be spelled “Ol-are Ngiro” (“the brown river,” Mol 1996: 32); “Ngiro” is preferred over “Nyiro,” but we use the latter due to the ranch's official name. Lugwagippe is also spelled “Lugwagibbi,” “Lugwagibi” and “Lukwagibbi.” Nglesha often is rendered “Ngesha,” “Ngelesha” and rarely even “Englesha.” We favor “Ngesha,” the simplest version used on most maps. Our “Ol Pongoni” site takes its name from the Maasai name of *Euphorbia candelabrum*, conspicuous at the site and the name cited for it by Dale & Greenway (1961), although rendered “Ol Bobongo” (Maasai) by Beentje (1994); in Kikuyu it is rendered “Mupung'ungi”; in the former, and “Mububungu” in the latter. Many of these names were written down by European settlers, and differ from authority to authority; they are in any case derived from languages without writing, and hence lack an ultimate authority. For one dam we use the English “Dirty Dam,” the water there varying greatly in color, but never clear; it locally is called “Nyekundu” (or “Nyukundu”) Dam, meaning “Red” or “Brown-red.” We map the sites (Fig. 2), and give designations referring to them, their coordinates, and a brief description of them here. Elevations, designations, and their habitat summaries are in Table 1.

Mukutan (MK, includes LA). At the Mukutan River, 0°36.6'N, 36°23'E, 23.5 km E of Lake Baringo and 43.5 km NNW Rumuruti at 1737 m (Fig. 2). The LAT (“Lovely Acacia Tree”) site, LA, is included here, as it is only 250 m S of MK in a lugga leading toward Elephant Grove (EG, see below); LA is at c. 1750 m. MK was our most important, and initial site, used for ringing from 1984 to February 1994. Here we ringed many hundreds of honeyguides, and numerous other birds. Originally MK was a very bushy riverine site with many trees, mainly *Acacia xanthophloea*, having a fallen old acacia with a cut-out beehive, which we employed as a wax-feeding station (Fig. 9). Surrounded by wooded and bushed hills to the E, NW and SW, it is at the entrance to the Mukutan Gorge, thus has rather steep, rocky slopes. It was heavily utilized by black rhino, elephant, African buffalo, eland *Taurotragus oryx*, yellow baboon *Papio cyncephalus*, other ungulates, small and other larger mammals, including predators. An improved road through the site, a lodge under construction downstream, livestock watering, and increasingly heavy browsing and grazing, gradually rendered the site unusable; we shifted to LA in 1994. Every visit to MK

open site below the dam wall but in similar wooded habitat. Near the dam, disturbances by road and dam maintenance personnel, livestock being watered, and construction of a hide for the night-viewing of leopards *Panthera pardus* (placed precisely in our netting site) caused some shifting in our use of the site. We had seven permanent net lanes at each site. Flooding sometimes prevented us from reaching LU. A settlement exists along the river SE of the dam, outside the ranch.

Northern Plain (NP). A site at 1853 m, 0°41'N, 36°26'E, 36 km ENE of Lake Baringo (Fig. 2), for a singing M Lesser Honeyguide. In open, degraded (by livestock overgrazing and heavy use by ungulates and elephants) *Acacia gerrardii* bushland (woodland in the 1960s) with primarily young, elephant-damaged acacias, *Euclea divinorum*, and occasional olives and *Rhus* spp., the site (Fig. 7) had three, then two, and finally one large *Acacia gerrardii* used as singing trees by the honeyguide. Abyssinian Scimitarbill, Brubrus, and other birds were attracted to this habitat and site. Northern Plain Dam is 400 m E of the site. In rainy periods mixed grass and bushes between the site and dam were whydah *Vidua* spp. singing areas. Thickets dense with *Carissa edulis* and *Euclea divinorum* SE of the dam attract nectar and fruit-eating birds when flowering and fruiting. Nets here were placed beside and between bushes, as it was too open to prepare net lanes. We visited here irregularly in 1986–1999.

Nglesha (NG). Farthest from our camps, this site at 2000 m, 0°30.5'N, 36°16.5'E, 17.5 km SE of Lake Baringo and 35 km NW of Rumuruti, was visited during 1984–1986, and then as a site (Fig. 2) throughout the study. It was sometimes impossible to reach NG due to flooding and bad road conditions, and the site was closed to us sporadically thanks to misbehaving elephants. Features were dense *Acacia abyssinica* woodland along two luggas, an area of often wet swampy forest of the two large *Croton* spp., dense thickets of *Euclea*, *Olea*, *Apodytes*, and others, sometimes clustered about an *Acacia abyssinica* on the slopes (Fig. 15), and adjacent thick herbaceous growth. There are a few scattered remnant *Juniperus procera* trees (there is one as far N as High Boma, marking former upland olive-cedar woodland/forest). We passed through Nglesha Center (an old farm), paddocks, cultivated fields and rolling slopes, much disturbed, with scattered large *Combretum* spp. on the hills (Fig. 4) and

Acacia abyssinica on the slopes, and a stream-crossing with a small marsh just upstream from it. Numbers of birds were found in the study area only in woodlands at this site. Nglesha, from Maasai (Mol 1996), means “with horns pointing in different directions.”

Sipili (SI). A key site (Fig. 2) at 1905 m, 0°32'N, 36°23'E, 29 km ESE of Lake Baringo and 39 km NNW of Rumuruti, visited in 1987–1999, lies along the Mukutan River, but the channel here is usually dry due to smaller dams to the E and Lugwagippe Dam upstream from it. It supports tall riverine *Acacia abyssinica*-*Croton* woodland (Figs. 11,12) in which large mammals seek shade and food. Its large acacias are gradually dying with little replacement. *Apodytes*, *Euclea*, *Rhus* spp., and other shrubs and trees occur in the woods, which gives way on apron-like surrounding slopes to bushland (Fig. 5) dominated by leleshwa, with some *Euclea*, *Olea*, and *Carissa*. A deep ditch had to be crossed by our vehicle (for security's sake), and in heavy rains the site was inaccessible. Studies were disrupted in the early 1990s when large olive trees were cut and placed around a tall *Acacia abyssinica* for construction of a lodge (exactly on our netting site); a labor dispute ended this attempt, and the acacia promptly died. Up to 15 active bee-hives occurred at times within view of the center of the site, making it difficult to net birds. Its many birds and mammals made this an interesting site. Sipili means “spear points” in Maasai (Mol 1996).

Pokoti (PK). An early site (1987–1999) at 1840 m, 0°40'N, 36°22'E, 28 km ENE of Lake Baringo and 50 km NNW of Rumuruti (Fig. 2), beside a usually dry lugga draining SW and entering a narrow, rocky ravine at the W of the site. The netting was conducted in a small alluvial area with 12–15 croton trees, *Acacia gerrardii* and *Euclea* spp. On the sloping hill to the S was degraded *Combretum* grassland that had been burnt several times. To the N and NW was thicker bushed grassland with *Acacia brevispica*, some *Rhus* sp., *Euclea* spp., and *Carissa edulis*. Faunal highlights (Fig. 17) included the only “colony” of Boran Cisticolas, and much mammal activity, including kongoni *Alcephalus buselaphus* and occasionally giraffe. A ranch security camp constructed precisely on our netting site in the early 1990s forced us to shift net lanes and to net there only after the personnel had left on patrol (at 07:30–08:00 h). Often the site was difficult of access, as the main route to it passes N through a dense



FIG. 17. The lower lugga (ravine) at PK site, with *Euphorbia candelabrum*, *Acacia gerrardii*, *A. brevispica*, small *Olea europaea*, *Euclea* spp., *Rhus* spp., and other plants, 26 December 1993. Bordering the lugga are *Carissa-Acacia* bushed grassland, in the NW and degraded *Combretum-Euclea* bushed grassland in the SE with various cisticolas, larks, Black-crowned Tchagra, and Buff-crested Bustards. Fires set by the Pokot and by the ranch staff in the 1990s burned all these habitats with some regularity. The main netting site was in more wooded habitat upstream to the E (right).

forest-like thicket in deep “black cotton” soil, which caused us to be mired, or to turn back.

Oi Doinyo Oirua (OD). A heavily wooded site along a lugga flowing SW from the peak of Oi Doinyo Oirua (really Oi Doinyo Oirirua, meaning “the Devil’s Mountain,” Mol 1996), and situated just below the W edge of the Laikipia Plateau (Fig. 2) at 1970 m, 0°40.25’N, 36°26.5’E, 37 km ENE of Lake Baringo and 44.5 km NNW of Rumuruti. Thick woods here held many olives, *Croton* spp., *Euclea* spp., *Rhus* sp., Poison-arrow Tree *Acokanthera schimperi*, and others. Great care was needed here due to the prevalence of buffalo, elephant and lion that could come upon us suddenly in the relatively dense woods. The many moderate- to large-sized olives provided many cavities for hole-nesting and other woodland birds. Visited regularly from 1987 to 1999, and often chosen

when wet because the rocky road readily allowed access. From it one can drive (Fig. 2) up onto the Plateau, to the E Ranch border, and W into an old boma on the slope of Kuti Hill.

Poromoko (PO). A far S site just under 1 km from the Main Gate, 420 m N of the S border, at 1980 m, 0°28.5’N, 36°20’E, and 6 km NNE of Kinamba (Fig. 2). Dense *Olea-Croton* woodland (Fig. 16) fringes a very degraded lugga with steep earthen sides, grass with bare ground and bushy thickets beside the woods. We briefly used a site to the N by 900 m, near Mad Dam at 1950 m in 1990, but moved to the S site within months. Featured at the main site were several singing honeyguides. We maintained six net lanes here from 1991 onward, and often employed a high net placed in the trees. Elephants frequently plagued us; we sometimes had to vacate the site, or employ a shotgun fired

in the air to hold them at bay (Fig. 16) when our noises and inevitable small campfires on which we placed green leaves to spread smoky “word” of our presence failed to make them leave. Woodland birds of various species were common.

Lugga Maji Nyoka (ML, UL). Two sites along this lugga (Fig. 2), the earlier Middle Lugga (ML) site at 1850 m, 0°39'N, 36°23'E (30 km E of Lake Baringo and 45.5 km NNW of Rumuruti), and the Upper Lugga (UL) site, less than 1 km N, at 1865 m. The first site commenced in 1987, when we radio-tracked the M Scaly-throated Honeyguide singing there, and we essentially moved to the UL site in 1990. The usually dry lugga flows more or less S 6 km to join the Mukutan River at “Maji Nyoka” (Python, more literally “Snake” Pool). Large mammals were common in the open to dense bushland and patchy woods, and formerly burned, bushy grassland areas to the W and S. Abandoned Saddle Boma lies below (SE) ML. Lugga Maji Nyoka is variously wooded with olives and crotons, especially against hill bases abutting the lugga, or open bushland or woodland, or steep-sloped ravines, with *Acacia brevispica*, *Olea europaea*, *Euclea divinorum*, and leleshwa, often densely into the lugga itself. We had to park on a nearby hill in *Combretum*-bushes grassland (Fig. 6), and at UL, near an abandoned small boma where lapwings were an occasional feature.

Tabarokwa (TA). At 1850 m, 0°42.5'N, 36°24'E this site is on the NW boundary (Fig. 2) abutting Pokot tribal land, near which clearing of bushed woodland and establishment of a small community took place in the 1990s. We studied on the Pokot side of the fence in *Acacia gerrardii*, *A. brevispica*, *Euclea* spp., some *Olea europaea*, and other plants and, on the ranch where the habitat was more degraded (Fig. 8). We worked on both sides of the fence, with local Pokot permission. Dry bushed hills surrounded the area.

Drainage here is downslope to the N and W, eventually to Lake Baringo.

Francis's Site (FS). Our far-NE site (Fig. 2) on the edge of the Laikipia Plateau at 1955 m, 0°40'N, 36°29'E. On black-cotton soil and difficult to reach when wet, was the location of an abandoned boma with bare, open land, thickets of bushes in grassland, and degraded *Olea-Croton* woodland patches. Often livestock and people were near this site. Like TA, this site dated only from June 1992 onward. We worked only four net lanes.

Center South (CS). From July 1992 to 1999 we studied at this site (Fig. 2), 1875 m, 0°34'N, 36°23'E located beside the main road from Center to the Big Dam, which is 500 m to the S. Here a normally dry lugga passes in from mainly leleshwa bushland W to the Mukutan River below Big Dam. The lugga was bordered by crotons, olives, *Euclea* spp., and some large *Euphorbia candelabrum*. We placed three net lanes in the woods on each side of the main road, sometimes employing high, tree nets as well.

Kuti South (or *Southwest*) (KS). Just over 1 km SW Kuti at c. 1855 m, this was dense *Croton-Olea* woodland, much of it lacking an understory, in the drainage area between Kuti and the acacia crossing, to the W (Fig. 2). Bushland on the gentle slope to the E led SE toward the Laikipia Plateau. The 2.5 km drive into the site from Posho Corner was in a zig-zag across alluvial and black-cotton soil (not negotiable when very wet), through alternating bands of bushed woodland and larger, overgrazed, mostly bare, bushed grassland, usually with little grass and scattered *Acacia gerrardii*, *Croton dichogamus*, and *Olea europaea* (trees of any size had sustained damage by elephants and browsing mammals). With FS, TA and PO, one of our sites away from a lugga and excellent for woodland birds and large mammals.

4. SOME ASPECTS OF THE AVIFAUNA

The birds of this W edge of the Laikipia Plateau and adjacent E edge of the Rift Valley escarpment include the following: highland plateau birds; intra-African migrant breeding and non-breeding visitors; upslope wanderers from lower, drier areas to the W and N; wandering highland forest birds from the S, and Palearctic visitors and migrants. Past-to-present burning, degradation and other human activities have put constraints on some habitats and expanded others. Populations of birds locally are influenced by: prolonged droughts; heavy and expanded rains; the various populations of grazing and browsing mammals, wild and domestic and their locations of activity; presence of numerous dams; burning, and other diverse human activities. The available habitats and the unique, three-seasonal rainfall are likely the main determinants of the current avifauna.

Favorable for migrants is the E escarpment of the Rift Valley at the W edge of the study area. Use of the escarpment for its updrafts ensures the sprinkling of migrants over the study area. Also, the presence of the Mukutan River (Fig. 2) as a wooded avenue between the edge of the Laikipia Plateau and Lake Baringo encourages upslope wandering (and downslope movements as well, see, e.g., African Fish-eagle and Barn Swallow) of birds of drier lower elevations with a different rainfall regime (Brown & Britton 1980, Lewis & Pomeroy 1989). These various factors make for a great diversity of the area's avifauna, with seasonal shifts that are significant, and extreme year-to-year variation in occurrence and numbers of birds, chiefly depending upon the amount and seasonality of the rains. We have recorded a total of 472 bird species in the study area, and have no doubt that others will be found to occur. Because of the duration of our studies, we are able to show shifts in the occurrence and abundance of various species.

To aid in our investigations we carried a large trunk full of books with us in the field, and held in camp bookcases with relevant field guides and handbooks from their dates of publication through 1998, as follows: Baker (1997), Barlow *et al.* (1997), Beaman & Madge (1998), Benson *et al.* (1971), Bruun (1970), Cave & Macdonald (1955), Chantler & Driessens (1995), Clement *et al.* (1993), Colston & Burton (1988), Cramp (1977, 1980, 1983, 1985, 1988, 1992), Cramp & Perrins (1993, 1994a, 1994b), Etchécopar & Hùe (1967), Fry (1984), Fry *et al.* (1992), all of the available Birds of Africa volumes, Gibbon (1991), Grant (1986), Guggisberg

(1985, 1986), Harrap & Quinn (1996), Harris & Arnott (1988), Harris *et al.* (1989, 1996), Hayman *et al.* (1986), Heinzel *et al.* (1972), Hollom *et al.* (1988), del Hoyo *et al.* (1992–1997), Jackson & Sclater (1938), Johnsgard (1988), Jonsson (1992), Keith & Gooders (1980), Langrand (1990), Lefranc & Norfolk (1997), Lynes (1930, 1937), Mackworth-Praed & Grant (1960, 1962, 1963, 1970, 1973), Maclean (1985, 1993) Madge & Burn (1988), Moore (1983), Mundy *et al.* (1992), Parmenter & Byers (1991), van Perlo (1995), Perrins (1987), Peterson *et al.* (1983, 1993), Porter *et al.* (1981, 1996), Restall (1996), Serle *et al.* (1977), Short (1982), Stjernstedt (1986–90), Stuart Irwin (1981), Svensson (1984, 1992), Turner & Rose (1989), Williams (1981), Williams & Arnott (1980), Williamson (1962, 1968a, 1968b), and Zimmerman *et al.* (1996). Also to hand especially were Britton (1980), Brown & Britton (1980), a full set of Chapin's Birds of the Belgian Congo, Lewis & Pomeroy (1989), van Someren (1956), and our set of *Scopus* as Kenyan references. Our other journals and references too old or fragile to carry in the field were available at our homes in Karen (through 1996) and Nanyuki from 1996 onward. We carried with us a comprehensive set of diverse botanical books, reports, and keys to diverse plants.

English names of birds and the classification herein employed follows those of Short *et al.* (1990), and of our preliminary list for the study area (Horne & Short 1993), with a few changes suggested by recent taxonomic studies (e.g., Baptista *et al.* 1999 for some estrildine finches).

Interspecific associations and flocks

Mixed-species foraging flocks and other interspecific associations have long interested us (Short 1961) and we attempted to monitor such associations as time permitted. Recent works (Hutto 1994, King & Rappole 2001, Latta & Wunderle 1996; see also Diamond 1981) discussed flock structure, dynamics, and benefits. We categorize here some associations that we encountered in the study area.

Associations reflecting concentration of resources. Loose associations form at sites where water and foods are concentrated. At particular areas about dams, as along the walls where vegetation affords protection close at hand, various doves, finches, starlings and other birds tend to concentrate. There is a suggestion that the

presence of larger species (e.g., doves *Streptopelia* spp., francolins *Francolinus* spp.) at watering sites attracts smaller finches and other birds to drink in proximity to these larger birds. Emergences of termites are often quite local and attract a range of insectivorous birds and others. More localized are associations about carcasses of animals killed by carnivores, or hung in the meat shed at Center. Vultures attend the former, whereas only Fan-tailed Ravens among larger birds partake of bits of meat at the latter. Starlings are important secondary species at carcasses killed by predators, but flycatchers, helmetshrikes and others are sometimes present, especially when the number of vultures drops. Weavers, starlings, sparrows, babblers, thrushes, and wagtails are among the species taking meat or fat from carcasses at the meat shed. There is an obviously protective association of up to five species of starling that roost in branches below roosting Tawny Eagles and Lanner Falcons. Nesting associations occurred of weavers (e.g., Red-headed, Speke's, Baglafaecht) at acacia crossing, and Speke's Weavers and Chestnut Sparrows in large trees at Center; a few starlings *Spreo* spp. sometimes nested among these finches. One curious association is that of Rufous Chatterers with larger Brown Babblers; the chatterers often followed the babblers at a distance of five to 30 m.

Foraging associations and flocks. Some foraging flocks are almost or entirely of one species, such as the flocks of *Zosterops* spp., April flocks of *Phylloscopus trochilus* and many starling flocks. Others of one may have a minority of other species. Examples are some starling and swift foraging flocks, finch flocks dominated by Yellow-rumped Serins or Red-cheeked Cordon-bleus, and small foraging flocks of social species that have one or several individuals of another, or other species.

Among the mixed-species flocks are the hawkling birds, mainly swallows and swifts, sometimes with Western House-martins and Eurasian Bee-eaters at considerable heights. These include the swifts that forage ahead of and around storm clouds, and also the swift watering flocks that drink aerially at dams. Foraging in front of storm clouds at great height may be five species of swifts as well as martins, swallows and bee-eaters.

Frugivorous birds associate at fruiting sources that may be dispersed (as *Carissa edulis*, and *Euclea divinorum*) or concentrated, as at a *Ficus* sp. At the former, starlings of virtually all species predominate, joined by other birds such as bulbuls, thrushes, orioles, and

others. Diverse species feed in fig trees, and under them forage flycatchers, drongos, and others taking insects disturbed by the fruit-eaters or attracted to fallen fruits. A January-fruiting *Ficus natalensis* attracted: orioles, bulbuls, thrushes, starlings and serins, with flycatchers, and drongos below the tree. A week later at the same *Ficus* were: bulbuls, hornbills, thrushes, starlings, orioles, and 17 serins. Starling flocks are diverse and forage on the ground, or in fruit-eating flocks. Large flocks of incoming Greater Blue-eared Glossy Starlings usually have smaller number of other starlings intermixed, and sometimes Chestnut Weavers join them in numbers. Most of these flocks have associated species only loosely foraging about the starlings.

Ground-foraging and bush-foraging mixed-species flocks dominated by finches have more associated species than do starling flocks. The chief flocking species are Yellow-rumped Serins, Red-cheeked Cordon-bleus, and Chestnut Weavers. Indeed, Yellow-rumped Serins and Red-cheeked Cordon-bleus commonly flock together in numbers of 25 to 100 or more, the serin usually being more numerous. At least 25 species at times join with these "yellow-rump/blue-rump" flocks. Their most frequent associates are other serins, estrildine finches, flycatchers, drongos, and, in April, Willow Warblers. Red-cheeked Cordon-bleu flocks, without serins, are usually in more bushy areas. Extraneous participants include Crowned Lapwings, doves, other flycatchers, white-eyes, warblers, other estrildines, thrushes, petronias, bush-shrikes, cuckoo-shrikes and *Eurocephalus* sp. Chestnut Weaver flocks included small numbers of other species feeding among them, and rarely many queleas.

Mixed-species foraging flocks in woodland and bushed woodland often involved flocks with two or more of these species: helmetshrikes, wood-hoopoes, hornbills, and babblers. Other species frequently joining these insectivores were flycatchers, especially drongos and Pallid Flycatchers, Crested Francolins, warblers, tits, white-eyes, puffbacks, orioles, weavers spp., and Long-tailed and Violet-backed Starlings. Bush squirrels *Panaxerus ochraceus* and dwarf mongooses *Helogale parvulus* associated with these foraging flocks.

The more generalized mixed foraging flocks, primarily of insectivorous birds, often include one or several starlings, finches, babblers, wood-hoopoes, and helmetshrikes of the above groups, and include diverse francolins, doves, honeyguides, woodpeckers, bulbuls, cuckoo-shrikes, bush-shrikes, thrushes, warblers, fly-

catchers, batises, monarchs, tits, sunbirds, white-eyes, orioles, and drongos. These may number eight to 25 or more species, and those without social flocks (of starlings or finches) may number 30 to 90 or more individuals. Of these generalized insectivorous mixed-species foraging flocks, we thought we had noted all species for at least 101. Out of 101 flocks, 58% were in December–February, 13% in March–June, 24% in July–September and but 5% in October–November. It is clear that these flocks are most common in dry December–February or -March when Palearctic warblers, thrushes, and flycatchers may join such flocks.

Mobbing of predators

We frequently heard sounds suggesting the mobbing of a predator, most often by bulbuls. However, we infrequently found time to investigate such incidents. Time for completely ascertaining the species and numbers of mobbing birds usually was lacking. Most mobbings in low cover, chiefly involving Common Bulbuls and Brown Babbblers, tended to be disregarded. The bulk of satisfactorily observed mobbings were watched as we sat in blinds, or were recording voices on tape, or were observing honeyguides as the mobbing progressed before our eyes. We document 59 of these, well and, we believe fully, seen.

Thus, our observations were biased against terrestrial predators; indeed, 47 of 59 (80%) of the cases involved avian predators. The other 12 situations involved a toad (curiously, mobbed by Red-cheeked Cordon-bleus), a mongoose, and 10 instances involving snakes; half of the instances of snakes were on the ground, half in trees or bushes. Of the avian predators mobbed, 33 were raptors, and of these over half were small raptors, Pearl-spotted Owlet (10), Gabar Goshawk (six), and the African Little Sparrowhawk (three). The other larger raptors included harrierhawk, Eastern Chanting Goshawk, African Hawk-eagle, an eagle-owl, and one each of Dark Chanting Goshawk, Wahlberg's Eagle, and Common Kestrel. The other birds mobbed were several cuckoos, a bush-shrike, a hornbill, a starling, and a raven. Two mobbings were of raptors against other raptors, namely a

Crowned Eagle persistently harrying and chasing an African White-backed Vulture and a perched Lanner Falcon attacked and caused to fly by a badgering F Pallid Harrier.

The mobbed snakes included only five that we identified: two boomslangs *Dispholidus typus* in bushes mobbed by francolins, bulbuls, three warbler species, and a bush-shrike; a black mamba *Dendroaspis polylepis* in a tree, mobbed by bulbuls, warblers, and a sunbird; a freshly killed puff adder *Bitis arietans* mobbed by c. 145 starlings of six species; and a live puff adder 1.2 m long mobbed by a honeyguide, six bulbuls, two warblers, six *Zosterops* sp., and a pair of paradise monarchs.

The 17 species that were mobbed included 10 raptors, three brood parasites (all large, hawk-like cuckoos), the sometimes predatory Crowned Hornbill, and three passerines, a bush-shrike, a starling, and a raven, all known as predatory at times.

The mobbing species included nine species of seven non-passerine families and 31 species of 21 passerine families. All three local babblers, virtually all local starlings, bulbuls, cuckooshrikes, various warblers, some flycatchers, some bush-shrikes, tits, the local helmetshrikes, a batis, white-eyes, two sunbirds, two orioles, the drongo, and five finches made up the passerine group. Prominent among these were the drongo, a babbler, a bulbul, and a flycatcher. Smaller species more usually mobbed smaller predators (to the size of the owlet and little sparrowhawk), and larger species mobbed larger (avian) predators. Smaller birds were also frequent at mobbing parties after snakes, regardless of the size of the snake. Fewer species mobbed the larger predators, except for the eagle-owl. The mean number of species mobbing group for Pearl-spotted Owlet was 5.6, the same mean as for mobbing snakes (10 species mobbed glossy starlings attacking one young Hildebrandt's Starling). The maximum number of mobbing species was 12 (for a snake), with 10 each for the starlings, and once, of mobbing the owlet. The African Drongo is exceptional in that it mobs almost any avian predator, regardless of size. Social species especially are successful, alone or with other birds, in mobbing perched avian predators and snakes.

5. SYSTEMATIC LIST

Species accounts

In the accounts that follow we indicate the *Months* of occurrence, in abbreviated style, for each species, followed either by Notes if the observations are brief, or by sections on *Ecology*, *Movements*, *Behavior*, *Voice*, *Breeding*, and *Specimen data*, as appropriate (they may be combined, or sections omitted). *Ecology* contains information on abundance, distribution, habitat, foraging, roosting and flocking and other habits. *Movements* are included, where occurring; if brief, they are noted under *Ecology*. *Behavior* includes displays in particular, and also interspecific behavior and aspects of breeding behavior. *Voice* covers both vocal and other acoustical displays, particularly song, and the seasonality of song; all recordings that we made are in the collection of the Library of Natural Sounds, Laboratory of Ornithology, Cornell University, Ithaca, New York, USA. *Breeding* treats seasonality of breeding and new information concerning nesting, eggs, nestlings, and such. *Specimen data* includes information about netted birds, specimens picked up from roads, a few collected individuals, and also observations on plumages of birds observed as well as of those netted. Molt data and soft-part colors are treated here, as well as subspecies represented. Taxonomic problems may be included; if several morphologically similar species occur in the study area we may place notes on identification here.

Generally we use four terms for abundance. Common indicates that a species occurs on every visit to sites in its habitat at the appropriate season. Uncommon infers that a species is seen on half the visits to appropriate sites in season, but is not always located there. Rare species are seen only occasionally and are absent from apparently suitable sites in season, or are restricted to one or two sites where they are not common. Casual is used for species not seen yearly in appropriate habitats and seasons.

STRUTHIONIDAE Ostrich

Ostrich *Struthio camelus*

Months. Resident in small numbers.

Ecology. Most often seen in open acacia woodland, degraded bushland and *Combretum* grassland in the NW quarter of the study area. Usually seen singly, in pairs or in small groups (to four-five). Eggs were taken by herders and young at times were taken by ranch security teams for (unsuccessful) "domestication." The

checking of nests led to mortality by baboon and hyena predation.

Behavior. One M with three FF left them and ran before us at 50 kph for c. 90s. A M attacked and kicked a large M warthog *Phacochoerus africanus* and pushed it, using its breast it rolled the warthog over three times, then chasing it away. Dust-bathes in road at times.

Breeding. Nests and eggs mainly found December–February, occasionally to April, thus during and following the little rains, at the driest time of the year. M calling or booming has been heard December–March, and courtship activities occur October–February; the latter behavior includes MF strutting display. Breeding is thus later than the August–October peak given by Brown & Britton (1980), perhaps because of the local occurrence of a third, often heavy July–August rains. Many eggs are lost, other than to humans; baboons have been seen breaking eggs with rocks (but the M Ostrich may have been frightened away by human observers). Mortality of young is high: one M had 10 small young with it 7 February 1988, six young by 15 February, and only three by 18 February.

Specimen data. Ostriches are of the pink to red-necked race *S. c. massaicus* (Brown *et al.* 1982, del Hoyo *et al.* 1992).

PODICIPEDIDAE Grebes

Little Grebe *Tachybaptus ruficollis*

Months. Resident in fluctuating numbers.

Ecology. Seen occasionally at all dams; breeding seems dependent upon sufficient rainfall but not such as to cause flooding, which can silt up the dams. Most often seen at Big, Nglesha, and Lugwagippe dams, where it also breeds; numbers of more than 20 have been noted only at these dams, in March, April, July, November, and December. These dams have some margins with vegetation, attractive to this grebe. Several times we have seen a Eurasian Marsh Harrier hunt this grebe, attempting, without success, to catch it between dives.

Movement. Moves from larger to small dams when rains occur, but in years with extensive flooding, or of drought, less numerous.

Behavior, Voice. Well described, e.g., by Brown *et al.* (1982), del Hoyo *et al.* (1992), and Fjeldså (2004).

Breeding. Partly grown young, calling, displays and territoriality indicate breeding April–January (later in years with more rain in July–August and little rains, than in earlier big rains). Most indications are from Big, Nglesha, and Lugwagippe dams, and occasionally Northern Plain Dam. The number of young noted was two-six. Breeding pairs and non-breeding-plumaged adults often occur on the dams, the former apart from the others. Adults in breeding plumage have been observed in all months, which is in accord with Brown & Britton's (1980) finding of some breeding in all months within this region.

Great Crested Grebe *Podiceps cristata*

Months. One December record, casual to rare visitor.

Notes. Horne saw it twice in the 1960s within the study area and S. Sassoon has also observed it (undated record, pers. comm.); our only record was of one at Big Dam 25 December 1984. The Black-necked Grebe *Podiceps nigricollis* also could occur rarely, as it is found on Lake Bogoria to the W (Hartley 1986) and occurs S of the study area (Lewis & Pomeroy 1989). Considered regionally-threatened by some (Bennun & Njoroge 1999).

PHALACROCORACIDAE Cormorants

Great Cormorant *Phalacrocorax carbo*

Months. All, effectively resident.

Ecology. Regular visitor at all larger dams in numbers of one-20. It moves about regularly, even when breeding, so is often seen overflying sites between dams. They fish and take crayfish at times. Perched cormorants pay no attention to Harrier-hawks overflying them closely. A Lanner Falcon passing nests of this cormorant caused no dismay, but a pass by a young African Hawk-eagle was met with stabbing of bills upward by young and adult cormorants (and darters). The cormorants are much more alarmed, calling, stabbing and beating wings when African Fish-eagles pass over, and likely this eagle preys on its young.

Movements. Young disperse and adults do so in time of drought, but usually at least a few remain. We have seen them overfly the Mukutan River to the W and E, so likely some "commute" to lakes Baringo or Bogoria to feed or visit (large numbers breed about Lake Baringo, Stevenson 1980).

Behavior. Courtship, with fanning of the tail, waving of wings and bowing, is well described by Brown *et al.* (1982). We note that a cormorant flying in to others often produces a "wiffling" sound with its wings as it

beats them strongly, then "power glides" to a perch. Is dominant over and supplants African Darters.

Voice. "Gaaaaa" calls while gular-fluttering; "ki-ki" call by incoming adult to adult (F?) at nest, differing somewhat from that noted by Brown *et al.* (1982).

Breeding. Breeds casually, breeding known before our project, but undated. We noted breeding from 1992 onward, mainly at Lugwagippe Dam, but at Nglesha Dam in 1998; breeding usually started about June, but starting May in 1992, March in 1995, July in 1997, and in November in 1996. Nests are of thicker, heavier sticks than those of darters, and when both nest together the cormorant nests higher in the tree. Nests numbered two-nine at Lugwagippe Dam, and seven at Nglesha Dam. We could not determine how many young were fledged. Post-breeding roosting of adults and subadults at Nglesha Dam suggests some success in breeding. The occurrence of trees in the dams is critical for nesting of cormorants.

Long-tailed/Reed Cormorant *Phalacrocorax africanus*

Months. All but May, October, and December; casual, probably yearly visitor.

Notes. May visit while overflying the area, especially as most records are from cormorants resting on islets in open water of Big Dam. Three remained at Lugwagippe Dam 8–29 January 1992, near Great Cormorants, but that dam has backwaters and entering streams with some reeds. Most were alone or in groups of two-four, with eight being observed once at Rhino Dam. Three were chased in Big Dam by darters 9 July 1993.

ANHINGIDAE Darters, anhingas

African Darter *Anhinga rufa*

Months. All; effectively resident, irregular breeder.

Ecology. As many as 11 have been seen, often swimming or on distant perches in larger dams, especially those with tree stubs projecting from the water (Center, Lugwagippe, Nglesha dams), or, as Big Dam, with islets well-isolated from the shore; usually only one, or two-four are noted. Also observed moving between dams, often up or down the Mukutan River. Almost all records are from the four dams just noted. Numbers may fluctuate because of silting in very wet rainy periods.

Behavior. Nesting darters stabbed upward and waved wings, much as Great Cormorants did, against an attacking immature hawk-eagle. Isolated trees in which they may nest often attract egrets, storks, Hamerkops, geese and sometimes birds of prey; disturbance by

such birds may have caused the failure of nests at Center Dam in 1987.

Breeding. Only three breeding endeavors noted, all in July–September (during and following annual July–August rains), during 1987 at Center Dam, and 1993 and 1997 at Lugwagippe Dam. The latter two nestings, of three nests each in a dead tree with Great Cormorants nesting above them, succeeded, whereas the six-nest attempt in a smaller tree in Center Dam eventually failed. In the last case, six nests were active with 11 adults about them 17 July; by 1 August only four adults were present and one bird incubated; on 4 August there were three darters, one sitting on a nest; on 6 August one bird still sat on its nest, alone. Thereafter the nests were used for roosting of 13 adults; and later darters and Great Cormorants roosted on the disused nests. One or two young likely fledged from each of the three darter nests at Lugwagippe in 1993 and 1997. Nests of the darter are smaller, constructed with finer twigs and sticks, and are situated lower in the tree than are nests of the dominant Great Cormorant when nesting in the same tree.

PELECANIDAE Pelicans

Great White Pelican *Pelecanus onocrotalus*

Months. January, May–July, December, in five years; casual visitor.

Notes. One record of two, another of 10, the rest records of single pelicans at Big, Center, Dirty, Lugwagippe and Titus dams, in the air over these and, of the 10, over MB (four broke from these and flew E, the other six headed W, toward Lake Baringo, where it occurs in all months, Stevenson 1980). The records of some individuals are difficult to total; for example, possibly the same individual at Big Dam May 1991, to 3 June, may have been that seen 5 June at Center Dam, and one of two on 23 June at Titus Dam, or, several birds may have been involved. Other records are in January, July and December (two). This pelican is known to fly considerable distances from its Rift Valley center of distribution (Lewis & Pomeroy 1989).

Pink-backed Pelican *Pelecanus rufescens*

Months. All, but not necessarily yearly; irregular visitor.

Ecology. Most records are of one pelican staying at a dam for one-two days, with a preponderance of records April–October and January. Groups of five or more are uncommon, and larger groups (five–25) were more common in the 1980s than recently (three groups of only five, seven, and eight in 1990–1998).

It is probably difficult for pelicans to obtain enough food to sustain them on the dams. On 4 September 1992 we found a dead adult in molt (partial carcass). Eight were apparently roosting, facing outward in a tight circle on the shore of Big Dam 9 July 1998. These pelicans roost on the shoreline, on spits that jut into the water, on islands and on trees growing in the dams.

Breeding. The few obvious immatures, and Pink-backs seen sufficiently close to note the blackish, shaggy crest of breeding adults, date from early May–October (to August for breeding-plumaged adults).

ARDEIDAE Herons, egrets

Black-crowned Night-heron *Nycticorax nycticorax*

Months. May–July, September; uncommon visitor.

Notes. Likely missed because we were usually away from its habitat at dawn and dusk. Seven records at acacia crossing (Fig. 3), Big and Center dams, at Ol ari Nyiro Springs, and one called over GMF at 05.15 on 1 June 1995. All were adults except for an immature at Ol ari Nyiro Springs. It has minimal habitat in the study area, but occurs close by (Hartley 1986, Lewis & Pomeroy 1989) and could readily wander into it.

Squacco Heron *Ardeola ralloides*

Months. January, September, two records, casual visitor.

Notes. Suitable reeds and other habitats used by this heron are very restricted in the area, so that it is not expected, despite its occurrence generally in the region (Lewis & Pomeroy 1989). Seen near Big Dam 1 September 1968 by Sassoon, Start, Start and Horne, and at the S end of Big Dam 30 January 1995. The latter was buffy, and streaked in part but had plumes visible on the crown. Also reported at Big Dam 15 October 1997 by S. Njagi.

Madagascar Squacco/Malagasy Pond Heron *Ardeola idae*

Months. One October record, casual.

Notes. Flushed from the edge of a buffalo wallow in EG 4 October 1986; it flew to a tree over the wallow and we were able to view it for a c. 20 min. Its dark, nearly black streaking was notable on the fore-breast; brown with some pale streaks above, and almost no trace of buff evident. It finally flew down the Mukutan River. This is one of the most N records in Kenya (see Hartley 1986, Lake Baringo; and Lewis & Pomeroy 1989). Breeds October–May in Madagascar

(Langrand 1990); although in non-breeding plumage the heron we saw presumably was in movement toward Madagascar. Classed as Vulnerable by Stattersfield & Capper (2000), and still declining (Kushlan & Hancock (2005).

Cattle Egret *Bubulcus ibis*

Months. All but February–March, uncommon but regular visitor.

Notes. Much of the study area probably has too much ground cover for this egret, which is apt to be seen about dwellings and domestic mammals rather than wild mammals. Seen mainly April–July (its breeding season in the region, Brown & Britton 1980), also November–January, with a few September–October records. Feeds at dams, roosting near dams or in trees in them. Numbers rarely reach 20 or 25. Uncommonly seen with warthogs and impalas *Aepyceros melampus* (once). Fully breeding-plumaged individuals were observed April–May and July–September, usually with one or several in non-breeding plumage. Some December–January adults were in partial breeding plumage. Often seen in flight.

Green-backed/Striated Heron *Butorides striata*

Months. All but March, October; uncommon resident.

Notes. In small numbers, mainly along the Mukutan River and its dams and at the acacia crossing. Regular about the MK site in the 1980s, but not seen there recently, and records sparse in the 1990s. Seen almost daily along the Mukutan August–September 1986. One foraged there in a pool among buffaloes 6 December 1985. Immatures were seen August–September; and an immature netted at Lugwagippe Dam 16 July 1990. The latter weighed 149 g, and had a yellow iris, yellow orbital-facial skin (no hint of green, see Kushlan & Hancock 2005), and a yellow gape with pink at the rear. This heron clasped its feet tightly around its bill for the entire time we held it. The records of immatures suggest June–July breeding, in accord with the sparse data of Brown & Britton (1980).

Little Egret *Egretta garzetta*

Months. January, February, June, October, November; casual visitor, five records.

Notes. Single, apparent adults, noted sporadically, has also been seen by S. Sassoon (undated record). Records in five separate years, all since 1989, and all but one at Big Dam. A fully breeding-plumaged bird, with plumes, was at Center Dam 16 June 1989, within its breeding season in Kenya (Brown & Britton 1980).

Occurs year-round on lakes to the W of the area (Stevenson 1980, Hartley 1986).

Yellow-billed/Intermediate Egret *Egretta intermedia*
Months. February, May–September, November–December; casual but likely regular visitor.

Notes. Observed c. 20 times, occasionally for several days. Three at Big Dam 22 June 1995 were in partial breeding plumage; other groups of two, 10, and 28, were observed at Big Dam in June and November. The other records were of single egrets at Big and Center dams, including one perched in a tree near a Great White Egret. Has also been seen in the area by S. Sassoon (undated record). Occurs all about the region (Lewis & Pomeroy 1989). Considered threatened regionally by Bennun & Njoroge (1999).

Great White Egret *Casmerodius albus*

Months. April–September, November–December; casual, regular but not yearly visitor.

Notes. Most records April–June, rest scattered in other months. Also seen in the area by Sassoon (undated records, and with the Starts and Horne). A few were noted on consecutive visits, e.g., four times at Big Dam 18–27 April 1996, and two at Big Dam all of December 1986. Other records are of one-two individuals, except for 20 about Big Dam 9 November 1992. Those seen closely appeared to be in non-breeding plumage. Habitat (reedy or wet grassy shores) is very limited for this species and the last egret in the study area. More regular at Lake Baringo (Stevenson 1980, Lewis & Pomeroy 1989).

Gray Heron *Ardea cinerea*

Months. Resident in small numbers.

Ecology. Low but variable numbers, normally one-three can be seen at any dam. Two-three pairs (breeding in the study area or just off it) can account for the Gray Herons we saw. Apt to be seen somewhere any day of the year. Occasionally feeds at Mukutan River edges and at temporary streams (acacia crossing). Most often seen (perhaps half of all records) at Big Dam, but Center and Dirty dams frequently have a heron about (note that these dams afford good visibility of much of their shoreline).

Movements. Regularly flies between dams; affected by aggression, but we have no information on particular adults, pairs, or “territories” (rarely are two seen near one another, e.g., on Big Dam, may be one at each end, nearly 1 km apart). Influxes not noted, but seen flying out of the area, and back in again at times.

Voice. Well described.

Breeding. No definite indications of breeding in the area; may well do so. Breeding for the region is in May–July and December (Brown & Britton 1980); we have seen immatures July–September and December. Two immatures foraged near one adult at Center Dam 22 September 1997, one immature was with two adults 12 September 1996 at Nglesha Dam and another was with an adult at Big Dam 26 September 1996 (suggesting two breeding pairs in 1996). One subadult was at Dirty Dam 5 February 1999. Some subadults may come from Lake Baringo (Stevenson 1980), or from the SW of the study area, where it breeds (Lewis & Pomeroy 1989).

Black-headed Heron *Ardea melanocephala*

Months. All but March–April; visitor, but not yearly.

Notes. We have *c.* 50 records, the most in July, otherwise a scattering in months indicated above. One-third are from dams, but most records are of foraging individuals in open well-grazed pastures, ditches, and swampy vegetation, and at temporary streams. Most Black-headed Herons are lone birds, with few records of two, and three roosted and foraged about Center Dam June–August 1991. Gray-necked immatures were observed in August 1987 and December 1995, and subadults noted in August–September. We know of no breeding colony nearby. Although often resident (Zimmerman *et al.* 1996), Lewis & Pomeroy (1989) mentioned influxes and movements of this heron.

Goliath Heron *Ardea goliath*

Months. All but March, November; scarce visitor.

Notes. We have *c.* 15 records June–August, and likely one record per month in other months indicated above. Except for two at Big Dam, records are all from Center Dam. There were no records for six of 14 years, including 1996–98. It is common and breeds at Lake Baringo (Stevenson 1980), the likely source of visitors to our area.

SCOPIDAE Hamerkop

Hamerkop *Scopus umbretta*

Months. Resident.

Ecology. Regularly seen, perhaps a dozen pairs present, mainly along Mukutan River, dams along it and adjacent woods. Forages at edges of these waters, and often about temporary pools, and springs. We observed Hamerkops leaping, flipping wings (flashing cinnamon in the tail and wings very reminiscent of the Sunbittern *Eurypyga helias*), cocking the tail and

catching winged termites as they fell downward after an emergence. Also skims surface of water like avocets *Recurvirostra* spp., catching insects; shuffles and paddles feet to cause movement of small bottom-dwelling animals.

Behavior. Severe competition occurs with Egyptian Geese for nests, and thus these interact frequently, even in flight when not nesting. One odd interaction resulted when four adult Hamerkops used a tree employed by a pair of geese to guard their nearby nest. Two of the Hamerkops mounted one another, each in turn jumping on the other's back, stomping the feet and beating wings, without cloacal contact; the other two Hamerkops called, and both geese then attacked and drove the Hamerkops away. Soaring display flights by one or two Hamerkops occurred between April–November, sometimes involving the pair, and other times one bird in circles over the other (see Brown *et al.* 1982).

Voice. Well described, e.g., in Brown *et al.* (1982).

Breeding. Active nests were mainly along the Mukutan River May–September, with young out of the nest from July onward; thus breeds after the start of the big rains (Brown & Britton 1980 gave the season as April–October for the region). This period also marks the occurrence of soaring and other displays, although we have seen these in January, as well. During 1992 there may have been two nestings at Lugwagippe Dam in May–June; copulations were also seen near one nest in June, and six birds were about it on 7 July. On 18 August copulations were seen, buffalo dung was carried to the nest, and a new cycle seemed to start. After noting them at that nest 4 September 1992, we then found them building a new nest nearby; geese took their new mud and dung platform from them before 13 November. Nesting probably is influenced by wetland habitat available to it, and could be confined to dams along the river. Nesting occurs occasionally at Northern Plain Dam, with no permanent stream and limited shoreline around it.

CICONIIDAE Storks

Yellow-billed Stork *Mycteria ibis*

Months. All; regular visitor.

Ecology. Visits yearly, except in time of drought (1984), but numbers vary year to year. Most records are from April–September and December–January. Usually occurs singly or in groups of up to three, occasionally to seven, and, rarely, 16. Interacts with African Spoonbills, may pirate food items from in front of feeding

spoonbill. Foraging modes include wing shading, shuffling feet to stir water, and jabbing with open bill (Brown *et al.* 1982). Also seen flexing one foot, then another, causing movement of the water. Occasionally stays one-two weeks about a site. Mainly seen at large dams, but occasionally at very small dams (especially with low water) and also temporary pools, and ephemeral flowing streams.

Movements. There are no nearby breeding colonies, and this stork is well known for its wanderings. Distinctively plumaged first-year and subadult birds are not present for more than a few days.

Behavior. One attacked a spoonbill, chased it in a circle around Center Dam, and came back to its original position. Flight heavy, more labored than that of African Spoonbill.

Breeding. Does not breed. First-year storks seen April–August, and two seen with three adults 28 December 1993 at Titus Dam. Subadults were noted in most months. Adults in breeding plumage were observed May–September and January. Breeding records from the region are May–August (Brown & Britton 1980); most Yellow-billed Storks seen in those months in our area are non-breeding adults.

African Open-billed Stork/Openbill *Anastomus lamelligerus*

Months. A single June record.

Notes. An adult observed closely at Center Dam, perched (roosted?) in a submerged tree with a Gray Heron and a Yellow-billed Stork, 1 June 1995, at 06:30 h. It has occurred throughout the year at Lake Baringo (Stevenson 1980, Lewis & Pomeroy 1989), and is known from Lake Bogoria (Hartley 1986). Zimmerman *et al.* (1996) noted its occurrence mainly below 1500 m; a flock of *c.* 90 circled over us, moving NE, at Nanyuki, 1950 m, 29 July 2001, at the E end of the Plateau.

Black Stork *Ciconia nigra*

Months. October–April; scarce Palearctic visitor.

Notes. One to several records yearly (except 1996), mostly along the Mukutan River including Olari Nyiro Springs; a few records at dams, as Center Dam and Titus Dam. There was one record at a temporary stream (29 January 1997). All the *c.* 23 records were of one–two birds, except for three, one of them immature-plumaged, at EG 24 February 1997. There are no records for March and only one for April (15 April 1997). One seen four times during January 1987 showed wing molt symmetrically at primary 8.

Abdim's Stork *Ciconia abdimii*

Months. Nine records in January, February, June, July, November, December; casual visitor.

Notes. Visitors observed on six occasions December–February, with one record in each of the other three months. Probably under-reported, as we usually were in under tree cover. Groups of three–four were noted in flight to the SSW 11 December 1983 and 27 January 1985; a flock of *c.* 200 circled SW over the Mukutan River 11 November 1984. The other records are from MK, Big Dam, Dirty Dam, Center Dam, and in an open pasture N of Center; none was apparently immature.

Woolly-necked Stork *Ciconia episcopus*

Months. All but March; uncommon but regular visitor.

Notes. Seen in most but not all years, more often seen prior to 1990. Occurs in wet situations, particularly along the Mukutan River and tributaries, and at Olari Nyiro Springs, but also in temporary woodland pools and at Center, Dirty, Titus and Big dams. Usually in ones and twos, occasionally three–five, and exceptionally nine were observed. May associate with Marabous and Yellow-billed Storks, and one fed with ravens on a buffalo carcass near the Mukutan River 23 July 1993. The only immature noted was with one adult 29 April 1990; a subadult was at MK 20 June 1991. Breeds W and S of Kenya, in November–March (Brown & Britton 1980).

White Stork *Ciconia ciconia*

Months. January–April, August, October, December; an occasional visitor.

Notes. Some dozen records in nine years, half of over-flying storks, half of storks on the ground. Flocks flying S were of 30 over Mukutan River 20 August 1986; of *c.* 30 in two wedges flying over Mukutan River 26 August 1986; and 48 flying over GMF 17 December 1996. Six in flight 19 December 1996 likely were those seen the day before along the road N of Center. In the open S of Center South Dam 4 February 1998 were four adults and one subadult. The record of 30 April 1997 was of one adult with 16 Yellow-billed Storks in the spillway of Center Dam. While the 30 April bird may have been ill, left behind in the migration N, or could represent a boreal summering stork, the two August flocks moving S could have been early Palearctic migrants. Cramp *et al.* (1977) reported it crossing the Bosphorus on migration S as early as 5 August, Schulz (1998) had SE European migration in July, and migration N in Israel as late

as June, and Brown *et al.* (1982) put some in Africa by August; they move rapidly, coming into sight to the N, and disappearing to the S along the Nile in S Egypt within five min (pers. obs.).

Saddle-billed Stork *Ephippiorhynchus senegalensis*

Months. One November record, formerly more frequent.

Notes. S. Sassoon and C. Francombe inform us (pers. comm.) that a pair was present about Nglesha Dam in the 1970s until 1976, when one disappeared; the remaining bird was seen thereafter to 1978. Whether or not they bred is uncertain. Horne remembers it there in the 1960s. A single adult in the Mukutan Valley near Ol ari Nyiro Springs 25 November 1985 is the only Saddle-bill we have seen there. Bennun & Njoroge (1999) considered it threatened regionally.

Marabou (Stork) *Leptoptilos crumeniferus*

Months. January–February, April–August, October–December; irregular visitor.

Notes. About two dozen records, not including very high overflying individuals (we would have missed most of these, working in woods). A scavenger at the Ranch's dump, which we rarely visited, and at mammal kills, as at an eland carcass in the Mukutan 10 January 1987, and four-seven on 10–11 February 1991 about an elephant carcass near Center Dam. One foraged by probing in mud at Center Dam. Some also roost, but these may be foraging locally at lion kills. Most records are of one-four Marabous; up to 11 have been observed, these at an *Acacia abyssinica* tree, apparently roosting. About half the records are from April–June. There are no breeding colonies nearby (Lewis & Pomeroy 1989).

THRESKIORNITHIDAE Ibises, spoonbills

Glossy Ibis *Plegadis falcinellus*

Months. January, April, June, July, five records; rare visitor.

Notes. All adults seen at Big, Nglesha, Center and Lugwagippe dams, one each 4 January 1997, 8 April 1993, 6 April 1996 and 18 June 1990, and four at Center Dam 8 July 1990. One was among various ducks at Big Dam, and another fed in muddy water near a Sacred Ibis. Lack of marshy vegetation likely is responsible for the paucity of records. Occurs at lakes Baringo and Bogoria (Hartley 1986), at the former occurs all year (Stevenson 1980).

Hadada/Hadeda *Bostrychia hagedash*

Months. All but November; regular visitor, possibly breeds.

Notes. Records few to many yearly, but could be resident near Nglesha and Lugwagippe. Most records are from S half of the study area, especially sites near the S border (the two noted above and PO). Observed as far N as the Mukutan River, Ol ari Nyiro Springs, GMF (flying over), N of Kuti (in mud after rains), MB, and heard N of FS, in the NE corner. Virtually all records are of a pair, or one, with four seen once, and, at Nglesha Center, 10 on 7 June 1991 and digging in a dung heap there 25 June 1991, likely including individuals seen 7 June. Often noted in valley S of the study area, where likely resident. Especially widespread in the area December 1991–January 1992.

Sacred Ibis *Threskiornis aethiopica*

Months. All; regular visitor, in varying numbers.

Notes. Mainly visits April–August; some numbers usually in December–February as well; usually only one-three, but occasionally up to 10 and rarely to 30. During December 1991 *c.* 20 were regularly about Big, Lugwagippe and Nglesha dams. Most visit briefly for a day or two, or up to a week or so. Almost all are seen at dams. Roosts in trees in or near dams, or occasionally away from dams. One seen eating a crayfish, which it dipped many times in water before eating. It loosely associates with other wading birds. Immatures have been seen mainly July–August, and once in January. Presumably the May–July visitors are non-breeders, as this is the breeding season in the region (Brown & Britton 1980).

African Spoonbill *Platalea alba*

Months. All; regular visitor.

Notes. Commonly seen on dams, usually larger ones; records well distributed April–September and November–January, fewer in February–March and October. Most often we see one-two, sometimes three-four, uncommonly to eight, and once 16 were observed. Occasionally feeds in temporary pools, and even road puddles, using a scything motion. Most appear to be resting rather than feeding; sometimes rests on tarsometatarsus; also roosts, usually in trees. Associates with Yellow-billed Storks, which may aggress at the spoonbill, and with Sacred Ibises. Often seen moving from dam to dam. They seem to subsist on food taken here, as they tend to stay longer than do other storks and ibises. We consistently saw three birds about various dams in December 1991 and January 1992. Breeding occurs to the W and S of the study area (Lewis & Pomeroy 1989).

PHOENICOPTERIDAE Flamingos

Greater Flamingo *Phoenicopterus ruber*

Months. August, one record.

Notes. We have no reason to doubt the report of three adults at Big Dam 9 August 1987 by S. Sassoon and party. Both flamingos occur frequently at lakes Baringo and Bogoria, just to the W (Hartley 1986).

Lesser Flamingo *Phoeniconaias minor*

Months. August, one record.

Notes. A pile of mostly white feathers with some deep red small feathers and a wing found on the SE shore of Big Dam 13 August 1997 proved to represent an individual of this flamingo that may have succumbed to disease or possibly been killed and eaten by an African Fish-eagle. The presence of crimson scapular feathers and the wing were diagnostic, as confirmed by J. Wachira of the National Museums of Kenya's Ornithology Department. Lewis & Pomeroy (1989) referred to wanderers, often moribund, away from Rift Valley lakes; it is well known to nest by the hundreds of thousands at Lake Bogoria, only 28 km SW of the study area, and Olson *et al.* (undated MS) list it for Mutara Reservoir farther E on the Laikipia Plateau. This flamingo is Near Threatened (Stattersfield & Capper 2000).

ACCIPITRIDAE Osprey, hawks, eagles, harriers, vultures

Osprey *Pandion haliaetus*

Months. April, September, two records.

Notes. Formerly a more or less regular visitor at large dams in the study area through the 1960s but rarely observed now. Our records are of one on a tree submerged in Center Dam 29 September 1987, and another perched in a similar tree at Nglesha Dam 8 April 1998. These are within the usual migration period (Lewis & Pomeroy 1989), and the area is along the E edge of the Rift Valley migration route.

African Cuckoo-hawk *Aviceda cuculoides*

Months. July–September, six records; casual visitor.

Notes. This interesting hawk was observed twice near TA, an immature perched, then flying SE 9 July 1994, and an adult 15 August 1993 that was caused to fly by a passing Gabar Goshawk. An adult N of Kutu 17 July 1989 was perched but dropped from the perch, jumped about on the ground and hopped into the air catching flying termites. An adult seen at UL 20 September 1986 perched there for 0.5 h, then flew, and was observed again N of MB, to the E of the first

site, an hour later. Possibly the same adult was noted 10, 12 and earlier 20 September 1986 about a small woodland patch NE of the Mukutan River and site. It took a lizard as it hunted low, bush to bush, scanning and perching from each bush. One other adult was foraging over the ML site 3 September 1987. These records fall within the period of movement in Kenya noted by Lewis & Pomeroy (1989), who show occurrence of highland cuckoo-hawks to the S and E of the study area. The highland population is little known.

Bat-hawk *Macheiramphus alcinus*

Months. October–November, four records; casual.

Notes. One seen in 1985–1986 about Old Camp, in a small, dense grove of *Olea* sp. and *Croton* sp. The observations were at daybreak 10 November 1985, and at dusk 30 October 1985, and 5 and 11 September 1986. Evenings it flew SE, and on the one morning flew NW. On two occasions it perched briefly in a large croton tree, affording clear observation. It occurs throughout the year at Lake Baringo (Stevenson 1980), and should be resident (Lewis & Pomeroy 1989). After 1986 when our camp was moved, we were no longer in a position to document its continued presence; lack of sightings elsewhere, despite our morning and evening telemetry work with honeyguides, and often early morning (dawn or pre-dawn) visits to our generally wooded study sites, suggests that it is indeed rare. Perhaps the local bat populations are insufficient to sustain it.

Western Honey-Buzzard/Eurasian Honey-Buzzard

Pernis apivorus

Months. April, one record; occasional migratory visitor.

Notes. This is one of the migratory raptors not usually seen from within our study sites. Our only record is of a perched adult F near acacia crossing 14 April 1995; brown above it showed some grayish about the barred breast and some rusty gray on the belly, but otherwise was of the typical phase of Jonsson (1992: 142). It flew low over the trees to the E when we flushed it, showing the diagnostic tail barring. Migrates along the Rift Valley edges (Lewis & Pomeroy 1989), which include the study area.

Black-shouldered Kite *Elanus caeruleus*

Months. All months; regular, possibly breeds.

Notes. Absent in 1984–85, the drought and thereafter, but then present in low numbers, especially in the triangle between Kutu, GMF and Center, at Nglesha,

and S from PK. Usually one seen at a time, sometimes about for several months (as September–December 1997 between GMF and the Mukutan River); two birds seen without conflict August, December and April. Displaying pair were at LU 8 April 1992, and two chased one another at PK 12 January 1994; calls have been heard only in January. Often hovers at various heights; also hawks insects in the air, as with swallows 11 April 1998. Interacts with other hawks: “buzzed” an African Hawk-eagle, was chased by a melanistic Gabar Goshawk; and was supplanted in hovering by a Short-toed Snake-eagle. One fed on insects at the Nglesha slaughter-shed. Immatures have been noted in September and December, but these were independent; Brown & Britton (1980) noted breeding in the region in eight of the months February–December. This kite may nest occasionally within the study area, but we have no evidence of this.

Black Kite *Milvus migrans*

Months. January–May, July, October, December; uncommon visitor.

Notes. We are uncertain why this kite is not seen more often, although we know that it has sometimes been persecuted as a predator on the Ranch. Sometimes one visits for a period, as one seen at Center five times in December 1991–January 1992, but most are present briefly. Observed most often near Center, Kuti and Nglesha, about Big Dam and at sites about the S boundary. One seen to take a mouse at the gate of Kuti House had a fully black bill; these black-billed Palearctic migrants were noted December, February, and April, all others seen sufficiently closely were yellow-billed local Black Kites. Only three records are of two kites, so there is no question of local breeding; this kite is not common at villages and towns in the area.

African Fish-eagle *Haliaeetus vocifer*

Months. All months; breeds some years, visitor other years.

Ecology. Feeds locally on fishes including *Tilapia* sp., crayfish (taken by clasping and chasing them in waters along the shore), Red-knobbed Coots, Egyptian Geese, and probably other large waterfowl and wading birds. One plucked from the water at Lugwagippe Dam an Olive Pigeon taken by an immature African Goshawk, but dropped over the water. C. Francombe (pers. comm.) has seen numbers of coots taken by fish-eagles at Big Dam; coots form a tight flock on the water, spend the night in a dense cluster on projecting bits of shoreline, and dive together when an

eagle approaches. Fish-eagles probably are seriously affected by silting that leaves the water muddy for weeks or months after very heavy rains. Overflights of the MK and EG from E-W and vice versa suggest that some “commuting” occurs between the dams in the study area and Lake Baringo, 25 km to the W. They roost about dams but also at times in trees along the Mukutan River, Sipili woods, and at MB. One was seen with a turtle (taken from muddy pools of a temporary stream), eating it “out” from the head end.

Movements. Noted above. Probably leaves the area during droughts (none present in late 1984, only seen once in 1985), and when the dams are overly full and silted.

Behavior. Aggressive toward other birds of prey. One dived, and called at an adult Martial Eagle and caused the latter to dive away. A pair of Tawny Eagles attempting to nest about Lugwagippe Dam frequently chased and attacked a Fish-eagle, and were in turn chased by the pair of fish-eagles there; the Tawny Eagle nesting failed.

Breeding. Nests only at Lugwagippe Dam in large *Acacia abyssinica* trees. Old nests may be used that are up to 8 m across; new ones are c. 2 x 1 m. These are at 12–30 m above ground. Laying occurred at least in 1986, 1991, 1992, 1995, and 1996. We can vouch for young fledging only from the 1986 and 1991 nests, two birds each, respectively in September and December. In the other years nests were readied April–July, with breeding thus April–October. Brown & Britton (1980) gave May–June for peak breeding at lower Baringo and Bogoria, and February–August for breeding in the highlands. The young disperse c. six weeks after fledging and do not stay in the study area; we see few subadults. Adults forage chiefly at Big, Lugwagippe, Nglesha, Center, and sometimes Dirty dams. Breeding adults often feed at Big Dam, carrying fishes or birds back to the Lugwagippe nest. Nest failures and failure to commence nesting likely are due to lack of sufficient food at nearby dams, especially in years of exceptional rains. Possibly such isolated pairs represent younger, less experienced birds using sub-optimal habitat.

Lappet-faced Vulture *Aegypius tracheliotus*

Months. July, one record; casual.

Notes. A single adult flew to the W, toward the Mukutan Gorge 6 July 1994. Obviously it is rare, though known from the Rift Valley W of the study area (Stevenson 1980, Hartley 1986), and seen to the SE on the Laikipia Plateau at Mutara (Olson *et al.*, undated MS), and Pinguone (Schulz & Powys 1998).

White-headed Vulture *Aegyptius occipitalis*

Months. September, ?; two sightings.

Notes. Not observed by us but noted twice by S. Sassoon (pers. comm.), at Nglesha September 1982, and undated, in the study area. This vulture is known at lakes Baringo and Bogoria just W of the study area (Stevenson 1980, Hartley 1986), and also at Pinguone to the E (Schulz & Powys 1998). Thought to be threatened regionally (Bennun & Njoroge 1999).

Hooded Vulture *Necrosyrtes monachus*

Months. April–July, September, November–December; 11 records, casual visitor.

Notes. Also seen by S. Sassoon in the study area, it was occasionally present at carcasses with other vultures. We saw as many as 20 about a lion kill 10 April 1994 at EG, but other numbers to seven only. One alone seen 18 November 1994 and 30 December 1996, flying over Big Dam. Otherwise with White-backed and Rueppell's vultures at lion kills of zebra and eland, or elephant carcasses. Probably under-reported, as we are under trees mostly, and are apt to notice it only when present with larger, more conspicuous vultures.

Rueppell's Vulture/Griffon Vulture *Gyps rueppellii*

Months. All but March; irregular visitor, sometimes in numbers, as after floods.

Notes. Conspicuous when perched along roads, near ranch dump, and near carcasses of dead mammals; also, when soaring in numbers. Most records April–September, which encompasses the breeding season (Brown & Britton 1980); not known to nest nearby (Lewis & Pomeroy 1989). They come down to perch in heavy rain. We have observed over 100 on occasions through 1991 and never more than 55 thereafter. Common, noted almost daily, April–May 1994 after floods killed many mammals. Mostly less numerous than African White-backed Vultures, but sometimes more numerous. May remain a week or more about the ranch dump, lion kills, and dead elephants. Roosts near carcasses, or uses tall trees about EG, MK, and SI.

African White-backed Vulture *Gyps africanus*

Months. All but March; irregular visitor, numbers vary, sometimes common.

Notes. Much the same in occurrence, and as conspicuous as Rueppell's Vulture, with which they usually associate and outnumber. Occurs in numbers often greater than two; rarely to 100; and when numbers are large is then outnumbered by Rueppell's Vulture. The dump area, and sites of carcasses, and in roosts,

were most often sites at which it was observed. Some roost near a carcass, and others roost in a large tree nearby, or at EG, MK, SI, and MB. At carcasses it gives way to Rueppell's Vulture. Most records April–September and December, fewer in other months. May spend 10–14 days about a (larger) carcass, two-three days about smaller carcasses. *C.* 14 seen regularly December 1992, about the dump. Does not breed nearby (Lewis & Pomeroy 1989), though known to occur to the E (as indeed do all six vulture species at Pinguone, Schulz & Powys 1998); we have no indication that it nests in the study area. A pair at MK 30 December 1985, somewhat isolated from the other 18–20 vultures, engaged in attempted copulation. Obvious immatures were noted in April and subadults were observed in diverse months, although never outnumbering adults. Some were usually present at times in April–May of most years, but in other months unusual, and in fewer years.

Egyptian Vulture *Neophron percnopterus*

Months. April–January; was regular visitor, only six records in only four of nine years in 1990s.

Notes. Observed regularly through the 1980s and immatures seen in most years through 1990, but only adults comprise recent records (1992, 1994 and 1995). Adults and immatures singly or in pairs comprise most of the *c.* 60 records. These were about Center, Kuti and Nglesha, at Center and Big dams, and among African White-backed and Rueppell's vultures at the dump or at carcasses. Fully brown juveniles (Cramp *et al.* 1980) were noted: 11 May 1990; a very brown one closely following two adults 6, 11 and 14 August, and 11 September 1987; one perched near an adult 23 September 1986; and one with two adults at Olari Nyiro Springs 31 October 1985. The young birds could have come from Lake Baringo, 25 km W, where it breeds (Lewis & Pomeroy 1989) in March–July (Brown & Britton 1980). B. Heath reported a melanic adult 8 April 1994, which must be rare, as such are not mentioned by Mundy *et al.* (1992), or Clark (1999).

Short-toed/Black-breasted Snake-eagle/Harrier-eagle *Circaetus gallicus*

Months. All but October, regular, varying numbers, possible breeder.

Ecology. Seen mainly in central and W study area. Often flies in evening, especially near storms or showers; quarters and hovers, to 30–40 m high, or even to 100 m or more. Several times observed with snake in tal-

ons or hanging from bill, and one noted carrying a small mammal.

Movements. Numbers fluctuate too much for a modest breeding population, and there likely are movements.

Behavior. Displays noted May–June and August. Two adults with an intruding subadult were observed at NG 18 May 1996, circling; the adults clasped feet, one flying upside down briefly, and one appeared to “push” the subadult away whenever it flew close. Two adults circled at NG 23 June 1992, the larger F simply moving in circles as the small M, tail spread, circled repeatedly and stooped, legs outstretched, calling. Finally, a pair circled closely, the birds 5–8 m apart over MB 19 August 1993, calling frequently. These seem more elaborate than described by Brown *et al.* (1982), and Ferguson-Lees & Christie (2001).

Voice. Calls from the displaying adults above were a “whee-yew” to “peece-eeeh” repeated to four-five times at various intervals. A nearly white-headed subadult overflowed us several times at EG and later at Center Dam, repeatedly calling “pyeeewp” or “pyee,” an essentially single-note call. These vocalizations are similar to those described for nominate *gallicus* by Cramp *et al.* (1980).

Breeding. There is no evidence of nesting apart from the occurrence of juveniles in May (29 May 1991, 18 May 1996) that could have come from breeding near the study area. Lewis & Pomeroy (1989) note its occurrence throughout the region and breeding SE of the study area. Brown & Britton (1980) had few records of breeding in the region, in February, March and May; the dates for juveniles fit such a pattern, as does the occurrence of molt of flight feathers in August (post-breeding).

Brown Snake-eagle/Harrier-eagle *Circaetus cinereus*

Months. All but March, October; regular visitor, possible breeder.

Notes. Flies lower, hovers less than last species, recorded less often. Not observed in 1985 (post-drought) and 1994. Observed all over, in same habitats as last. Often hunts from a perch (but hunts in flight more often than allowed by Borrow & Demey 2001 in W Africa). We noted a subadult blotched below 2 January 1992. A pair through September 1986 and 1987 were observed flying about, both calling “kok-kok-awk,” and also “pee-eeeee,” between MK and Center Dam. An adult in molt was seen 2 February 1992. Breeding was given as February–May by Brown *et al.* (1982), but Brown & Britton (1980) listed from our region nine breeding records February–August, four of them in

June–August. It may breed in the study area or nearby in August–October; the frequency of observations in August–September, and its disappearance in October, suggests that it nests outside the study area.

Banded/Western Banded Snake-eagle/Harrier-eagle *Circaetus cinerascens*

Months. November, two records; rare visitor.

Notes. This eagle was unexpected, but Horne, acquainted with it in W Kenya, saw both birds. One circled slowly low over the Mukutan River 19 November 1985, and the other circled low over MB 19 November 1994. Its short tail with the diagnostic broad white band, and pale-banded belly, make it readily identifiable. Mainly occurring in W Kenya, there are records from E of the Rift Valley, S of the Laikipia Plateau, and E to Mt. Kenya (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996). Brown *et al.* (1982) suggested that this snake-eagle is an August–February visitor to East Africa, where it seems not to breed. Our sightings are within this period.

Bateleur (Eagle) *Terathopius ecaudatus*

Months. All but March; regular visitor, may breed.

Notes. Observed in all years, less frequently after 1993, none in 1998. Sightings were mainly in the W part of the study area, with only three seen in the E. Possibly bred, at least formerly, at the W border of the study area. Immatures and subadults were seen in most months. Pairs were observed in May, July, September, and December. A loud-calling M was over MK 3 January 1988 and ML 7 February 1988. A pair attacked an African Hawk-eagle over MB 28 May 1990, the F making eight-nine attacks on it, and the M three, the hawk-eagle turning over and clutching upward with talons spread each time a Bateleur attacked. It was chased SW. Early on 11 July 1990 a pair perched in the open at ML, faced the sun, wings spread and feathers turned partly upward forming an “open bowl” toward the sun, holding this posture for 7 min (M) and 10 min (F). No subadult or immature was with an adult, and thus they were independent; several in June–July were in almost to fully dark juvenal plumage, the rest having plumage, facial and leg colors of various immature stages (Brown *et al.* 1982, Clark 1999). It breeds in most months within the region (Brown & Britton 1980).

African Harrier-hawk/Gymnogene *Polyboroides typus*

Months. All but March; probably resident.

Ecology. Found along dry or wet watercourses and dams, observed one-six times yearly, except 1996.

Adroitly catches termites during emergences. Noted pulling bark off a dead *Acacia gerrardii* tree, and peering beneath remaining bark and into crevices above Great Cormorants on a stump in Lugwagippe Dam. Inspects tree cavities and weaver nests in search of prey. One ate bits off the carcass of a hare *Lepus* sp. at Posho Corner. An adult in mud of an empty Northern Plain Dam caught a frog (or toad), carried it to an acacia, and delicately ate it, with much wiping and scratching of face, bill and feet over 15 min. Drinks from streams and pools.

Movements. Presumably resident (Brown *et al.* 1982).

Behavior. Displays of a pair involved circling, M calling “sweeeeee,” and twisting in the air to actually softly touch F below it; also, F rolled over repeatedly below M in flight, touching toes and talons with M. The foot-touching was not mentioned by Brown *et al.* (1982) in describing such displays, which they noted as occurring within 2 km of the nest, but was reported by Ferguson-Lees & Christie (2001).

Voice. Well described by Brown *et al.* (1982). A juvenile following an adult in the Mukutan Valley called “kee-wheeee,” perhaps a combination of the nestling’s “ki-ki” and “sweeee-sweeee” calls of those authors.

Breeding. The above-mentioned displays in January–February, an adult accompanied by a calling juvenile 11 August and 21 September, April calling, and carrying of branchlet, apparently for nesting on 23 April, all indicate nesting in the W part of the study area, along the Mukutan River and tributaries. Breeding seems to have been January or February–August, before, during and after the big rains; this is at variance with the October–February breeding noted for the region by Brown & Britton (1980), and the October–January breeding noted by Ferguson-Lees & Christie (2001). An October molting adult, presumably post-breeding, also is in accord with a January–August breeding season (seasonality in the subregion about Laikipia may reflect its unique triple rains).

Eastern/Pale Chanting Goshawk *Melierax poliopterus*

Months. December–February, May, July, September–October; irregular visitor, may rarely breed.

Notes. C. 22 records of this hawk, and 35 of the next have involved careful identification, especially since this goshawk is supposed to occur below 1600 m and *M. metabates* W of the Rift Valley (Lewis & Pomeroy 1989, Zimmerman *et al.*, 1996). In fact both occur in the study area; indeed 76% of the records of this species and 62% of the records of the next are from the same sites at 1750–2000 m. We have included

only certainly identified individuals. Given fewer records of this goshawk, two points are: 1) fewer of this species occur April–August (only seen in May and July), 39% of the records (versus 57% of records of *M. metabates*, and latter occurred in all five months); and, 2) this species occurred September–October, in which we have no records of *M. metabates*. One adult foraged using its feet to pull chips of bark from the trunk, in one case taking an insect from under the removed bark, behavior seen otherwise only in the African Harrier-hawk. One chased a Crested Francolin and was halted and driven off by a Gabar Goshawk. We otherwise saw a Gabar join two Crowned Lapwings and two African Drongos in chasing an Eastern Chanting Goshawk. However, a subadult Eastern Chanting Goshawk (molting into adult plumage) called “phee-eee-ee-ew” many times in mobbing a Verreaux’s Eagle-owl, joined by drongos, orioles and a group of Black-lored Babblers. Molting individuals were seen October–December. Yellow-legged, dark immatures were observed May, July, September, and December (breeding is thought to be February–March and August–October, Brown & Britton 1980). Breeding occurs within our “quarter square” (0°30’ to 1° N, 36° to 36° 30’ E) and just to the SE of our study area (Lewis & Pomeroy 1989; they show breeding by *M. metabates* in that quarter square as well, likely about lakes Baringo and Bogoria, Hartley 1986). Also reported to NE (Schulz & Powys 1998), lower than our area. On the open slope near KS site 26 May 1996 an Eastern Chanting Goshawk repeatedly sang its mellow, piping song (see Brown *et al.* 1982) for 0.5 h, suggesting breeding close to the study area between the big rains and July. C. two-thirds of the records were at five of the 13 sites, (EG, MB, Center, SI, and near Main Gate). This hawk is presumably an irregular visitor from the N and E. Recently we had 11 records in 1995 and 1996, but none from 1993, 1994, 1997, and 1998, and only one each in 1991 and 1992.

Dark Chanting Goshawk *Melierax metabates*

Months. All but March and September–October; almost regular visitor.

Notes. Observed more often than the Eastern Chanting Goshawk (under which their occurrence is discussed), visiting from nearby breeding areas to the W, about lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986). Both chanting goshawks are attracted to the edges of woods along watercourses, wooded and bushed grassland and bushland, and thus are not so

different in habitat preferences (at least when not breeding) as the literature suggests (Brown *et al.*, 1982, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996, Ferguson-Lees & Christie 2001). The Dark Chanting tended to occur about dams, where the Eastern was not seen. MB was an especially favored site for both species, perhaps because of a mixture of densely wooded, lightly wooded and bushed habitats, sometimes with flowing water. The Dark Chanting Goshawk was several times encountered at puddles on roads, both bathing and hunting in them. Chases and takes birds, including Crested Francolins. One carried off a *c.* 20 cm agamid lizard; another seemed to be hunting grasshoppers. In contrast with the Eastern Chanting Goshawk, we observed no juveniles of this species, only subadults, usually with signs of adult feathering and colors (e.g., gray on parts of the back and wings, sometimes the breast, and gold legs, gold-orange to orange cere); the flight feathers tend to be immature. Subadults were noted in most months (January–February, April–July, December). Both chanting goshawks are noted as breeding in the quarter square (50A, Lewis & Pomeroy 1989) in which the study area is located, which is perplexing as the lower elevations in this quarter square, including Lake Baringo, are occupied by Dark Chanting Goshawks that breed to 3000 m, whereas our observations suggested breeding by Eastern Chanting Goshawks above the former. During 18 to 31 May 1990, three adults of *M. metabates* and two adults of *M. poliopterus* were observed in the study area, and from 8 to 28 May 1996 we saw one adult and two (different) subadults of *M. metabates* and two adults, one subadult and two juveniles (all different individuals) of *M. poliopterus* in the study area.

Gabar Goshawk *Micronisus gabar*

Months. Common resident.

Ecology. Likely the commonest bird of prey, can be seen anywhere though favoring wooded situations near water. To a lesser extent hunts in bushland, even in extensive leshwa stands, in bushed and wooded grassland, and in trees along the walls of dams. It eats birds, especially, including: birds in mist nets, starlings, robin-chats and all three species of babblers, buntings, weavers, and others. Chases honeyguides *Indicator* spp., and comes readily to distress-calling birds in hand. Immatures chase prey as big as Brown Parrots, Common Sandpipers, and even Olive Pigeons, and essentially “play tag” with social birds such as wood-hoopoes. As a result, it is mobbed by many

birds, most often African Drongos, Lilac-breasted Rollers, and White-rumped Helmetshrikes. Interacts, often strongly, with other hawks, especially the African Little Sparrowhawk (the latter keeps out of the way of adult Gabars, usually, but a pair of them can drive off an immature Gabar). One Gabar also joined Crowned Lapwings, drongos, and babblers in driving off an Eastern Chanting Goshawk, and the Gabar then became the target of the drongos and babblers. Not known to migrate or wander far.

Behavior. Brown *et al.* (1982) do not mention or describe flight displays, several types of which we have observed. In one type the M circled, climbing, every so often closing its wings in a dive (calling “kee-kee” as it dove) about a dozen times. Likely the F was perched nearby. In one variation the M flies upward in a fluttery flight, then dives, calling. Another variation had the M carrying a headless, bleeding bird (sp.?) while displaying to the calling, circling F below (disrupted by a diving African Hawk-eagle chasing the M). Another type involved the M and F flying in tight, *c.* 40 m circles, to considerable height, then tumbling down together with claws clasped, to drop to a perch. Finally, circular, stilted flap and glide displays, one over another, may have been aggressive in context, as the lower bird flew away. Ferguson-Lees & Christie (2001) mentioned flight displays for it, but none was described.

Voice. The likely contact call is the well-known “dee-dee-dik” (also: “EEE-dee-dik,” “dee-dee-dee-dik,” “whew-weet-weet,” or “dee-dik”), resembling a shortened version of the song of the Diederik Cuckoo, and heard throughout the year. Juveniles utter a burry “zhee-zhee-zheek,” often frequently repeated. Also gives a piping “pi-pi-pi” call.

Breeding. Breeds July–February or later, with incubation noted October–February. The nest is at 6–20 m in a croton or acacia tree, near the top but with canopy over it. Adults carry sticks to the nest, often circling and displaying with stick in talons. Aerial displays occurred May–July and once in December. Nests are too high to see contents, and our work involves noise that keeps hatchling young low in the nest. Usually we were able to discern a brooding or incubating adult in the nest. One nest was rendered unusable by a pair of Tawny Eagles relocating their nest to the same tree in which the Gabar pair had built. Usually two young fledged from a nest, in November–April. Our breeding dates are somewhat later than the July–October or November of Brown & Britton (1980; based upon seven nestings). More or less independent juveniles

were seen December onward, and immatures were noted to August.

Specimen data. Melanic Gabars were seen almost yearly, and about EG from 1989–1998, but not the same individual. These birds were mainly black, but all had a white area in the wing and of course normal soft-part colors. Other individuals were more sooty, less black, but were similar in pattern. One of two immatures produced (parents black, and typical) at EG in 1993 was black but barring was visible on its breast; its sibling was normally colored. A sooty brown, vaguely darker streaked, white-rumped subadult was seen July 1989. Three Gabars were netted. A very large F (see Brown *et al.* 1982) weighed 263 g, with wing 224 mm; it was a worn adult in normal plumage with early primary molt and incipient body molt, and was taken attempting to remove a honeyguide from a net 18 November 1988. A M taken 23 September weighed 118 g, with wing 183 mm; in generally fresh plumage it showed an odd condition of molt of the rectrices, with old rectrices 1 and right 2 and 4, new rectrices left 2, and 4–6, and right 3 and 6, while left 3 and right 5 were in pin. Some soft-part colors were: orbital skin gray, gape orange, bill, tongue and throat black, and legs, toes and pads orange-red with black claws. Finally, a juvenile 1 April 1998, fledged that day at CS weighed 110 g; its tail was in pins, the flight feathers of the wings in long pin, with feathers partly grown over its body. Its body skin was yellow; bill was black with a yellow base and incompletely developed cere; mouth lining was black, the tongue black with pink under the tongue and at sides of the mouth. Its eye was yellow-green, the orbit showed yellow above and below the eye, and the legs were yellow anteriorly and gold behind.

Pallid Harrier *Circus macrourus*

Months. November–February; occasional visitor, 0–nine per year.

Notes. Some FF and immatures October–February could have been this or Montagu's Harriers. FF predominate November–December, MM in January–February, 24 records; a few of these could represent repeats of earlier birds, but we have no indication that this harrier carries in the area. They occurred at 14 sites, four of them dams, but passes over woods as well, as at KS, OD and PO. Two were at puddles in the road, drinking (or hunting, or about to bathe). The second of two immatures (identified by buffy white collar, well-marked face, buffy, weakly streaked underparts, and buff underwing linings) was on the

ground at Northern Plain Dam, delving into elephant dung for dung beetles. Simmons (2000) noted that Palearctic harriers in tropical Africa may eat more insects than they do when breeding in the N. We observed 11 MM and 11 FF that we could safely identify. The dates and sites are within the ranges given by Lewis & Pomeroy (1989). Listed as Near Threatened by Stattersfield & Capper (2000).

Montagu's Harrier *Circus pygargus*

Months. October–February; occasional visitor, 0–six per year.

Notes. As for Pallid Harrier, immatures and FF not identifiable are not counted among the *c.* 20 records. More often seen in the S study area, and more frequently lower, over bare areas, grassland and cultivation than the Pallid Harrier. Of 13 FF and immatures, 11 were noted 20 October (one record for October)–16 December; all adult and immature MM, as well as two FF occurred 18 December–22 February (one record for February). F was accompanied by an immature in November 1992. Of the five immatures seen, two could be identified as MM by dull gray feathers on the upper back and on the neck (see Beaman & Madge 1998). The study area dates fit well within the framework provided by Lewis & Pomeroy (1989).

Eurasian Marsh Harrier *Circus aeruginosus*

Months. September–April; occasional visitor, 0–five yearly.

Notes. *C.* 21 records, 13 at dams, also reported (no dates) by S. Sassoon. Harasses waterfowl and shorebirds; one immature M stooped at Egyptian Geese several times, and a F almost caught a frantically diving Little Grebe. Also courses low over woodlands while migrating. Near Center 1 January 1988, three FF and one M flew S. Two subadult (second-year immatures) MM were noted (November, April), both having two-three gray rectrices with signs of bars (Clark 1999). Although the single record each for September and for October is a F, there are equal numbers of both sexes in November–January. The early record was at Big Dam 26 September 1995; there is no record for February–March, and one, the subadult M noted above, 6 April 1995.

African Marsh Harrier *Circus ranivorus*

Months. February, June, November; casual, three records.

Notes. An African Marsh Harrier, perhaps a F, coursed back and forth over the small marsh at the crossing

of a stream W of Nglesha 20 February 1988; while we watched it a Common Buzzard dove down at the harrier and they grappled, circling low, flying at times on their sides, talons slashing. Swiftly, an African Hawk-eagle entered the fray from woods to the W; the harrier dropped nearly to water level and sped NW downstream, while the buzzard evaded the hawk-eagle with a near cartwheel. An adult was seen 20 June 1997 flying back and forth low over Center pasture (wet from rains); we noticed symmetrical molt in its inner primaries. Finally, a white-chested immature flew low over us to NE at the road beside CS 18 November 1994. These could have represented dispersing harriers from Lake Baringo (where it breeds) or Lake Bogoria (Stevenson 1980, Hartley 1986, Lewis & Pomeroy 1989).

African Goshawk *Accipiter tachiro*

Months. Resident, secretive, not readily observed.

Ecology. Large territories (Brown *et al.*, 1982) and shyness probably explain why we did not see this goshawk more than three-four times a year; our arrival on site is noisy, both to attract honeyguides and to encourage buffaloes and elephants to move away from our net lanes. We have seen it attack a chicken and a Superb Starling at Center; and observed it holding an Emerald-spotted Dove, a Ring-necked Dove, and a Common Bulbul. Almost all sites at which we have seen it are well-wooded especially along the Mukutan River (MK, SI), and at Nglesha. Low and even higher flights over woods cause rapid fleeing of birds; one coming suddenly into view, noisily flushed over 100 Olive Pigeons gathered to drink. No movements are known in our area.

Behavior. Harries other birds of prey, as an immature Martial Eagle, and likewise is attacked by them, e.g., an African Hawk-eagle swooped upon an adult that dropped into a dense wooded lugga to escape, and the adult attacking a chicken at Center was the object of an attack by a Lanner Falcon. No breeding behavior was noted. Several circling individuals gave repeated "chip" or "tik" calls in August and September.

Breeding. Immatures were seen in May and December. Two pairs circled, one N and one S, over MK 11 February 1988 (the pairs moved apart, N and SW). Otherwise pairs were observed and calls heard only July–December, these constituting the evidence for breeding. Perhaps four-five pairs could occur in the study area, centered on the river and its tributaries, and Nglesha-Poromoko. Breeds March–July and November–December (Brown & Britton 1980).

Specimen data. An almost entirely black, yellow-eyed African Goshawk flying leisurely from cover was that frightening the pigeons noted above. One July adult was in wing molt at *c.* primary 7 to 8. We netted a M, probably after netted birds, at NG 15 February 1991; it clutched a wounded Emerald-spotted Dove. The M goshawk weighed 226 g (the dove weighed 50 g), with wing 237 mm and tail 189 mm; gray above with a fine white superciliary stripe, it had a white throat with very fine gray-brown shaft streaks, and differed from most adults we have seen in having white underparts with gray-brown barring and only a hint of rusty in some basal bars (with Dean Amadon we examined four breast-flank feathers, eight throat feathers, two secondaries, and a central, an outer, and one other rectrix that we plucked from the M; they matched those of some variants of *A. tachiro sparsimfasciatus* in the AMNH collection) Measurements also fit that race, the only one known from Kenya. Soft-part colors; bill steely gray-blue, cere greenish yellow; eye gold-yellow, orbital skin yellow; and legs and feet yellow.

Shikra *Accipiter badius*

Months. May only, presumably one record, two days 1990; casual.

Notes. Observed in flight over the road NE Kuti 15 May 1990, and an identically plumaged adult was seen perched and in flight in bushland beside the Sipili woods next day. Shown in all the squares and quarter-squares around our study area, and as breeding in our quarter-square (at Lake Baringo, where breeding occurs October–November and February–April, Stevenson 1980) by Lewis & Pomeroy (1989), it occurs patchily in highlands. Thus, a rare visitor, probably from the Baringo-Bogoria (Hartley 1986) population to the W.

African Little Sparrowhawk *Accipiter minullus*

Months. Resident; common, though less so recently.

Ecology. An active hunter, predator and "tester" of agility of small birds that may chase one, and be chased by it. Keeps to dense cover in woodland, forages into nearby bushland, but through cover, not over the canopy. It is attracted to mist-netting operations, and is difficult to keep from birds in nets because of its fearlessness. We saw it regularly at all sites, but since 1995 we have had fewer records (only one in 1997 and two in 1998). Regularly chases birds to the size of small doves and Brown Parrots, as well as various honeyguides; one took a fledged African Paradise Monarch and an immature killed an adult Af-

rican Thrush, hit while drinking. We noted African Little Sparrowhawks hitting Black-headed Orioles in flight, but likely this represented aggression, as the oriole frequently mobs and chases this hawk. Over one-half hour at MB we saw one hawk: a) chase a Brown Parrot b) get chased by four orioles; c) attack and chase in turn each of three Bearded Woodpeckers (the woodpeckers returned to their original positions); d) sustain a swooping attack by a Hildebrandt's Starling; e) be chased again by three orioles; and, f) disappear in a swooping attack and chase of one of the orioles! Generally, however, this hawk darts from cover at prospective prey.

Behavior. It is mobbed less often than is the Pearl-spotted Owllet (a likely competitor of similar size), but occasionally drongos, orioles and paradise monarchs mob them and rarely so do warblers, including Palearctic Willow Warblers and Garden Warblers. Aerial displays have been observed several times and include stilted flight with fast beating of wings, then gliding of a M to a F and, high, circular flights of a presumed M above its territory. Calling, paired birds, the M of which carried an item of prey to the F (they then disappeared, calling, into cover) were noted. The M and F may call; the F follows the M, fluffing its rump-upptail feathers, its undertail, and raising and lowering its tail frequently.

Voice. We note vocalizations heard that do not precisely match those stated in the literature (Brown & Amadon 1968, Brown *et al.* 1982, Zimmerman *et al.* 1996, Ferguson-Lees & Christie 2001). During pair displays “tweek-tweet-weet” calls, “kwick-wick-wik” calls, and “weet” series were heard April–December. One pair rather used “kee-yew, kyew-kyew” calls carrying sticks and displaying. “Klee-klee-klee” is another call of adults, which also “chip-chip-chip” at hawks such as the African Hawk-eagle, and at us. Fledged young called “pee-ya” repeatedly, following adults.

Breeding. Nests were high in usually dense acacia, cotton and olive trees and were built in May, August–September, and December–January (n = 10). Immatures are said (Brown *et al.* 1982) to rapidly change to an adult plumage over c. two months, but see Ferguson-Lees & Christie (2001: 562), and we have seen freshly and worn-plumaged immatures November, January–February, April–July, and an immature-plumaged F constructing a nest with an adult M December–January; the last pair failed as the sticks gathered (F hung upside down attempting to obtain sticks,

with many failures) often fell through the nest. The F is the chief builder of the nest (Tarboton 2001). Brown & Britton (1980) noted four breeding records in October–November; we find that they breed within and just after all three rainy seasons.

Specimen data. We netted 11 of these hawks, seven immatures to subadults (molting into adult plumage) weighing 65–77 g; one weighed 77 g, the other six were at 65–69 g. Four adults were at 70–78 g, so weights were rather uniform, and lower than those given by Brown & Amadon (1968), Brown *et al.* (1982), and Maclean (1993). The three molting adults had wings 139–141 mm, and the April non-molting adult 147 mm; the four non-molting immatures had wings 135–141 mm, the three subadults not molting outer, long primaries measured 138–145 mm. Noteworthy items concerning plumage are: the presence in immatures and especially adults of broadly white-based feathers of the hind-crown and nape that sometimes show and, the four central uppertail coverts are long and white in adults, these coverts being shorter, white, with a black spot on each feather in immatures. An important matter of soft-part colors is that the gape and tongue of immatures and adults are black (pink under the tongue); the yellow cere is connected around the base of the bill by a narrow yellow line that circles the mandibular base – this means that an open bill presents a yellow-bordered black area to the front, possibly important in displays at close range. The orbital skin varies in adults from yellow to pale orange, and there is a yellow “flange” of skin over the eye. The eye is yellow to gold; a likely breeding, April M had the iris gold with an orange-red outer ring. Legs vary from orange-yellow to orange (in breeding M), more orange anteriorly and yellow or yellow-orange posteriorly; even the toe pads are the same orange or orange-yellow, and the black talons are conspicuous against the orange or yellow.

Eurasian Sparrowhawk *Accipiter nisus*

Months. November–February, April, six records; casual visitor.

Notes. Kenyan records of this Palearctic visitor were given as under 20 by Zimmerman *et al.* (1996), and only five by Lewis & Pomeroy (1989); we think it more regular than do they, and have observed at least five, and probably six of this species. The last noted was a F, brown, fully and finely barred below with five dark tail bars and a dark ear-patch set off by the white superciliary stripe; it had yellow eyes, and hunted low over bushland in hills E of EG 18 April 1986. Pos-

sibly this was a very late subadult F Eurasian Sparrowhawk. It closely resembled a subadult with brown upperparts and wavy ventral barring that showed buffy white in its nape, seen 11 November 1984 at MK. Another F, but adult with gray-brown upperparts and even, fine brown ventral barring on white to the thighs, with white undertail, was perched at ML 19 November 1988; it held a bulbul-sized bird in its talons, and egested a pellet as we observed it, hopping upward in a tree, and finally flying. It too was yellow-eyed. The other three records are of adult rufous-cheeked MM without a white mark on the nape, gray upperparts, a fine white supercilium, and fine rusty bars on white below. These were seen in the Mukutan Valley near or at MK 9 November 1985, 1 January 1992, and 5 February 1985; we netted the last individual twice on 5 February, and netted it again 1.5 km away on 6 February 1985. It was a small typically plumaged M, finely rufous-banded below on white, with but a hint of buffy in the area of the thighs; with five tail bars and a white patch on its gray nape. It weighed 123 g, and its somewhat abraded wing was 180 mm. Its soft part colors were: cere yellow, eyes yellow-orange, legs yellow, claws black. The four hawks at the MK site were in attendance at our nets and had to be chased a number of times; the 5 February M was after a Common Bulbul in the net. None of these remotely tended toward the rufous underpart color of the Rufous-breasted Sparrowhawk *A. rufiventris*, a possibility as a wanderer from highland forests to the S, and none had the coloration or wing-tipping of Levant's Sparrowhawk *A. brevipes*, a very rare boreal visitor. All were in "edge" habitats or bushland, not within dense woods, when seen, although the nets were more or less in cover.

Black/Great Goshawk/Sparrowhawk *Accipiter melanoleucus*

Months. January–February, September, December; seven records, casual visitor or possible resident.

Notes. Observed at well-wooded sites (Mukutan Gorge, EG, PO, NG), except for an adult at GMF and one at ML (where heavily wooded narrowly along streams). Known from just to the E and S of the study area (Lewis & Pomeroy 1989), we observed four adults and two immatures (both of the rusty-plumaged morph), and found a dead subadult F. The subadult found at EG 19 February 1988 had granular ova and an ovary measuring 10 mm. It was in molt to adult plumage: primaries 1 to 5 were new, as were the inner secondaries, the rectrices were old, juvenal, except for the pair

of black central rectrices; the body was adult except for old brown feathers on the back, old rusty feathers at the sides of the throat, and others alongside the rump and under the wings. It had no wounds, and was dried and emaciated. The records are outside of the March–June breeding season (Brown & Britton 1980); Brown *et al.* (1982), and Ferguson-Lees & Christie (2001) noted that some wandering occurs.

Common Buzzard *Buteo buteo*

Months. September–April, in ones and twos; 12 birds, 10 dates; casual visitor.

Notes. Observed in five years only, mostly adults more or less split evenly between gray-brown and rufous phases (Porter *et al.* 1981, Brown *et al.* 1982); most showed at least pale rufous if not chestnut in the tail (*Buteo b. vulpinus*). One gray-brown adult was seen heading S 27 September 1995. Other boreal autumn records are 18 October 1992 (rufous phase), 19 October 1992 (gray-brown phase), 7 November 1992 (immature rufous phase), and 26 November 1994 (rufous phase). Boreal winter visitors were 28 December 1989 (brown-rufous intermediate), 16 January 1989 (gray-brown phase), and 20 February 1988 (dark brown phase). Unusually late, boreal spring records were: 6 April 1995 (brown adult with pale cinnamon-brown tail bearing fine bars), and 18 April 1994 (two, a gray-brown adult over GMF lazily flying N, and later a rufous-brown adult flying N). Although Brown *et al.* (1982) stated that this buzzard has left Africa by April, and March is the main northward period of movement in Kenya (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996), Maclean (1993) noted that it was in S Africa until April, and Harrison *et al.* (1997) show scattered South African records into late April. Obviously Common Buzzards leaving South Africa in April can be expected in East Africa (the race *vulpinus* migrates through E Africa) as late as late April and even early May. Our records are likely of buzzards straggling to the E of the Rift Valley migratory pathway (Lewis & Pomeroy 1989).

Augur Buzzard *Buteo augur*

Months. All; probably resident along W and S borders of study area.

Ecology. Usually seen soaring, average five-six observations yearly, *c.* 74 records. Not seen in N, E and SE portions of the study area. Common in farmland just S of the study area, could breed about NG and along W border. Usually drops on prey from some height; we have seen four episodes of hovering in the

air, twice in front of storms. Also hunts from a perch, and one ran about a ploughed field at NG for *c.* seven min, presumably chasing mice or locusts, or other insects. Sometimes hunts at our nets; one took a Common Bulbul from a net; and attracted to calls of birds in our hands. Two seen flying with a small hare *Lepus* sp. in their talons. Also harasses other birds of prey. *Behavior.* One tumbled in the air over and about a second, presumably its mate, as they circled close together over EG 19 July 1989. Two in tight circles around one another called continuously (voice as noted by Brown *et al.* 1982) above NG 21 September 1997.

Breeding. No definite records, but a begging, dependent juvenile with an adult at NG 14 September 1988 suggests breeding at or near that site. Pairs were seen most often July–September (also February, April), calling was heard May–October and December, and juveniles observed June–November. The dearth of records of immatures otherwise suggests that the adults we observe are resident, and breed locally in or near the study area. Breeding likely occurs April–September; Brown & Britton (1980) gave March and June–September for this region generally. We note that 58 of our records are April–September, and 16 from October–March.

Specimen data. Melanic adults were noted 10 June 1990 at MB and 13 June 1990, probably the same individual, at MK; likely another, but possibly the same adult was over the area between MK and EG 7 February 1998. This buzzard or these buzzards showed the typical “red” tail and white in the flight feathers of the wings of the dark morph.

Lesser Spotted Eagle *Aquila pomarina*

Months. March, November, December, three records; casual.

Notes. An adult showing white basal primary marks and pale brown along the upper wing coverts, circled lazily N over NG, and uttered a “kweek-kwek” vocalization 22 March 1993. On 2 November 1992 we saw a juvenile circling over MB, with its conspicuously white-marked upper wings; 35–40 min later two immatures, perhaps including the MB eagle, were circling S over Kuti Strip. Finally, an adult circled over Posho Corner to the S 21 December 1996. This eagle migrates along the Rift Valley as at lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986), just to the W, and these records presumably are of migrants wandering E of the main route (Lewis & Pomeroy 1989).

Spotted/Greater Spotted Eagle *Aquila clanga*

Months. Casual, one record, January.

Notes. An adult large, all-dark, narrowly pale-rumped eagle, marked below only by somewhat pale undertail coverts, circled low over Big Dam 2 January 1995. Its size, relatively small-appearing head, markings and pale-based, short tail indicated that it represents this eagle, known from some dozen Kenyan records through 1992 (Zimmerman *et al.* 1996). Occurrences are in the Rift Valley and S to the Tanzanian border (Lewis & Pomeroy 1989), mainly in the highlands, and include December and January records. It is listed by Stattersfield & Capper (2000) as Vulnerable.

Tawny Eagle *Aquila rapax*

Months. Common resident.

Ecology. Can be seen anywhere, but unlikely along E border (FS, OD). There seem to be two to four pairs, one in the central region, one about MK–EG, one at NG, and one about LU, although these are not always present. It takes prey by dropping from soaring flight, hunts from a perch, and scavenges carcasses. One in a dead acacia pulled loose bark with bill and talons along a branch, eating items, perhaps beetle larvae. It preys on hares, birds such as francolins, geese and guineafowl, and may even attack young baboons (unsuccessfully in three cases). One immature attempted to harry a Verreaux's Eagle-owl into releasing its hedgehog prey, hitting the owl with its wings and clambering about it; the owl retained the hedgehog. A Hamerkop was taken at Rhino Springs. Probably gets scraps at carcasses where it attends the large vultures.

Movements. None, but immatures wander and non-breeding adults forage far from their centers at times.

Behavior. Defends nest area, driving off other eagles in concerted attack by the pair, as against Martial Eagle. Itself is mobbed at times by Crowned Lapwings, African Drongos, and Fan-tailed Ravens. Nest failure at Lugwagippe Dam was attributed to constant interactions with nesting fish-eagles; although the Tawny seems to hold its own during encounters, they may interact too often to permit successful breeding. Displays include aerial ones we have not seen described. M in presence of perched F does a high glide, going into free-falling cartwheels, flying upward, turning upside down, falling, then going up again and repeating this two or three times, uttering slow “oonk” to faster “took” series. Sometimes both adults perform looping rolls together, followed by copulation. Copulation

seemed to involve shaking and fluffing of M, often after the somersaulting rolls. The M also may hover, circled by the F, followed by copulation (M bowed, whistled "wee," then gave a donkey-like "onk" series and mounted her). The M also may circle high, then plummet down toward the circling F that flew upward to meet the M, over which the F twice rolled. Displays rather as Cramp *et al.* (1980) described, but with more aerial displays; see also Ferguson-Lees & Christie (2001).

Voice. More varied vocally than Cramp *et al.* (1980) and Brown *et al.* (1982) described. MM "bark" from "took" to "owp" or "awk." Before copulation M called: "kyow," or "hek-hek," or "ah-kwook," or "whee" plus distinctive "onk" notes; F once gave a "krowk." Other calls a "chok" when agitated as by a mobbing Gabar Goshawk, a "tch-kup" series in attacking an African Hawk-eagle, and within-pair interactive "nyaw" notes. Also a "nyek-uk, nyek" and "kyow-kyek-yek" by a pair interacting with a third adult.

Breeding. Nest construction, displays and copulation begin May–October, or later if there is nest failure, to December. Over the years, most nests had young July–October. Since the EG pair nested at that site since at least 1982, most data we have come from that often successful pair. We have seen no breeding attempts and associated displays in the study area January–April in any year. The breeding seems centered upon the July–August rains, i.e., following the big rains and generally before the little rains. We have observed nestlings July–January and fledging from September–February. Nests are in tall acacia (*Acacia xanthophloea*, *A. abyssinica*) trees; one was in *Euphorbia candelabrum* at 8 m. Nests are abandoned if there are structural problems, or predation, e.g., by yellow baboons. One fledgling was probably killed by an eagle-owl. Fledged Tawny Eagles remain about the nest for c. two months; an immature may be permitted to stay until the next nesting season. Immatures in the area are of the pale, typical "café au lait" plumage (Brown *et al.* 1982). We noted that MM usually are darker than FF; such FF were pale-phased adults, or perhaps were subadults, that is, older immatures that attempted breeding. The pair remain more or less about the breeding site, often roosting in the nesting tree used while nesting.

Specimen data. Molting adults were seen January–April. Eye color was noted as greenish yellow or yellow in adults, brown in immatures. Birds were of the nominate race (Ferguson-Lees & Christie 2001).

Steppe Eagle *Aquila nipalensis*

Months. November–April; uncommon Palearctic migrant and visitor.

Notes. C. a dozen records, including a juvenile drinking at Center Dam 8 January 1987 and two juveniles flying N over MB 2 April 1998 (noted usually as October–March visitor, e.g., Brown *et al.* 1982, Zimmerman *et al.* 1996, but immatures are still leaving southern Africa into late March, Harrison *et al.* 1997). Adults and older subadults were observed 18 November–27 March, and included three seen perched, in which we noted the long gape not found in Tawny Eagles, and a paler brown to cream-buff hind-crown mark known in many Steppe Eagles (Cramp *et al.* 1980, Stevenson & Fanshawe 2001). Overflying adults were identified only if soaring or stooping to give sufficient time for observation; overall dark plumage, projecting head and bill and moderately long tail were key features that we checked; we saw barring in the flight feathers of most, and the long gape line was seen in several. One adult bathed and drank in Center Dam 11 February 1988. Most soaring eagles were over open country and edges of woods, or over dams. Both March records were of two adults moving NNE. This species, if it is a species, migrates usually in groups and often very high (Lewis & Pomeroy 1989). Our observed November and March–April migrants (eight eagles, five records) probably were just E of the main Rift Valley throngs, and the other six records (six birds) December–February likely were wandering boreal wintering individuals.

Verreaux's/Black Eagle *Aquila verreauxi*

Months. May, August; two records.

Notes. Reported also by S. Sassoon (undated record), known to occur in the lower Mukutan Gorge the slope W of the study area (pers. obs.), and about lakes Baringo and Bogoria (Hartley 1986); we have but two records. Much of the study area may be too wooded for its hunting, and we likely missed it by being in woods much of the time. One soared from the SW to NW at the Mukutan Gorge, below and over the MK site 29 May 1989, and another circled over Nglesha Dam 11 August 1997. These records are within the breeding period of the Lake Baringo Verreaux's Eagles (Stevenson 1980).

Wahlberg's Eagle *Hieraaetus wahlbergi*

Months. January, May, July, November–December; casual.

Notes. Records total six, including a circling, closely following pair W of Saddle Boma, near the escarp-

ment 22 November 1994, and one soaring over GMF slope 28 November 1994. All were typical adults of the dark plumage phase. Horne considered it to be at least a regular visitor in the 1960s. One of these little eagles roosted at SI in a large *Acacia abyssinica* 15–16 May 1990, and showed its small crest. Another at LU 3 July 1995 showed symmetrical molt in the primaries and rectrices. The other two records were 29 January 1995 above MB, and 16 July 1996, soaring E of EG. Breeding has occurred at Lake Baringo (Stevenson 1980), and Lewis & Pomeroy (1989) considered it mainly an August–April breeding visitor, but also a resident in small numbers near the equator (Ferguson-Lees & Christie 2001).

African Hawk-eagle *Hieraaetus spilogaster*
Months. Resident.

Ecology. More often in pairs than any other raptor, three-four pairs well spaced over the study area. Hunts chiefly by dropping on prey from high up, but one went through a mist net at MB. One was seen attacking a Giant Kingfisher, an immature ineffectively went after nesting anhingas and cormorants (and was driven off), one carried a bustard, probably the Buff-crested, and another stooped at and missed a Helmeted Guineafowl. Forages over all areas and habitats, even over well-cleared, cultivated hills just to the S. Sometimes hovers in place, and “hangs” on strong winds. Seems not to have changed in abundance throughout the project. No movements noted.

Behavior. Often pursues and is sometimes attacked or chased by other hawks. A pair attacked and forced an eagle-owl to move. Chased by Black-shouldered Kites, Augur Buzzard, and Bateleurs; mobbed at times, by birds as small as Fiscal Shrikes and Mosque Swallows. Courtship was described by Brown & Amadon (1968), and Brown *et al.* (1982); may circle over one another, M chases F, then in close circles, F may turn over several times per circle, talons thrust upward, M with legs out toward her, or M may dive with F following, pulling up close to the ground. They may circle high into the air, then, M above, stoop, brake, and dive to c. 6 m above ground. The pair may drink together. *Voice.* Well-described by Brown *et al.* (1982), often sounds like mewling in displays of pair. Begging, dependent juvenile gave repeated “yellp” calls.

Breeding. Courtship displays May–July and January, nest construction December, juveniles with adults August, November and January. The season seems long, April–January (Brown & Britton 1980 gave May–December), and is marked by adults occurring mainly

in pairs. The nest was seen only at SI, where constructing in December 1988, and, the same nest, December 1989, in an *Acacia abyssinica* at c. 18 m height. One pair seems centered about MK-UL-MB, another around SI-LU, and a third pair near the SW border of the area. Rather few older immatures (buff-white below with some streaking) were observed. Breeding thus is in the main big rains through the July–August rains (it may be centered upon the latter), and at times also after the little rains.

Specimen data. Obviously molting adults were seen July and December–January. Where pairs seen closely, it was noted that MM tended to be whiter, less spotted and blotched than FF.

Booted Eagle *Hieraaetus pennatus*
Months. One December record.

Notes. We probably miss this uncommon but not rare, small Palearctic eagle that moves alone. A pale-phased Booted Eagle was “holding” into the wind N of acacia crossing 26 December 1996; we first thought it a streaky-throated young African Hawk-eagle, a pair of which were circling just to the N, but saw that it was smaller and had a clean white/black wing pattern below, with a dirty white, dusky-tipped tail. It then dropped, and cornered to go up again, showing its pale rump, white cross bar on the wing and a pale spot on each side of the back between the wing bases (see Jonsson 1992). It was facing into an E weather front, not flying as if migrating, and presumably was a boreal winter wanderer. It occurs in the general area, to the W and S (Hartley 1986, Lewis & Pomeroy 1989).

Ayers’s Hawk-eagle *Hieraaetus ayresii*
Months. June, two records; casual

Notes. A possibly subadult (buffy sides of neck in patches), barred-tailed, barred-winged and heavily blotch-spotted Ayers’s Hawk-eagle flew low over us at PK, 5 June 1990, alarming parrots and other birds. As it went by we noted the suggestion of a crest and distinct, dark eye-patch. Another, even more ventrally marked adult overflew NG, 22 June 1994; its “spots” tended to be bar-like to the rear and streaky anteriorly, the background pale (white) area being less than that covered by the markings. These likely represent pre-breeding (later breeders, see Brown & Britton 1980, Ferguson-Lees & Christie 2001) wanderers or non-breeders from just to S, where wholesale clearing of highland forest (N and S of Nyahururu) is occurring. Considered regionally threatened by Bennun & Njoroge (1999).

Martial Eagle *Hieraetus bellicosus*

Months. All but February; resident on or near study area.

Ecology. Observed all over except SE corner (LU), very irregularly; most often seen about NG, and more often in W and central sites than in E, probably reflecting its use of the escarpment area in the W. Prey includes Helmeted Guineafowl and francolins, likely Hildebrandt's. The study area probably includes part of the territory of one pair in the SW, about NG. Almost half the sightings were of immature Martial Eagles, probably dispersing or wandering young birds. *Behavior.* It is often harassed by other eagles, falcons and corvids. Courtship activity has not been seen, other than circling in pairs, with calling, mostly about NG.

Voice. Several calls are worth describing as not fitting within the framework stated by Brown *et al.* (1982: see also Ferguson-Lees & Christie 2001). An adult uttered "pur-eeew" calls at a chasing crow. A molting adult over us gave a quail-like "tink-de-tink-tink" call, apparently at us. Calls by immatures included: "queeunk" probably at us; and a perched eagle called "kip-pip-pip-pip."

Breeding. No clear indication of breeding was noted. High, calling, circling adults (pairs) were heard and seen May, July, August, September and November. No recently fledged immatures were seen, although one independent immature at NG 27 May made such a poor attack on guineafowl that it may have been newly independent; and two immatures perched together at NG 28 July. Brown & Britton (1980) gave May–September as the breeding period for this region generally. It occurs throughout the region in small numbers (Lewis & Pomeroy 1989), requiring up to 200 km² as a home range (Brown *et al.* 1982).

Specimen data. An adult in mid-primary molt was observed in November.

Long-crested Eagle *Spizaetus occipitalis*

Months. April–September, December–January; regular, perhaps resident in SW.

Notes. C. 20 records, most at NG; elsewhere seen once at MK, at SI, and (pair) at Lugwagippe Dam. It is seen regularly in farming country to the S, and perhaps is marginally a bird of the study area. Calls were heard ("peeew" to "whee-oh" notes in series) only at NG in August, September and December, but no breeding activity was noted; it breeds after rains, but over much of the year, depending on area and rains (Brown & Britton 1980). A pair nested successfully

near Nanyuki in October–January, during and after heavy little rains. One sunned itself, head held down and back feathers spread apart, at NG.

Crowned Eagle *Spizaetus coronatus*

Months. All but March; has become scarce since 1990–91.

Notes. All records in SW one-third of the area, in the Mukutan drainage (and Gorge area), and about NG. Calls and displaying pairs occurred PK and UL to NG, mostly over the Mukutan River, January, May–June, and calling-displaying, apparently single eagles were noted May–September and February. One juvenile at MK 11 February 1987 had an orange gape and many feathers still in pin – it was barely able to fly; its M parent called overhead. Thus breeding occurred nearby, probably in the Mukutan Gorge. Breeding in the region is supposed to occur April–October (Brown & Britton 1980), but they note breeding in November–December as well, and in January for nearby regions. One displaying, calling M broke from its displays to dive on a white-backed vulture that fled, flying low and fast, down the Mukutan River. Bennun & Njoroge (1999) thought it regionally threatened.

SAGITTARIIDAE Secretarybird

Secretarybird *Sagittarius serpentarius*

Months. May, December; casual visitor.

Notes. We have three recent records, Horne remembers seeing it occasionally in the study area during the 1960s and S. Sassoon reported (undated record) it as well. It may have been more frequent at times when more cattle were carried on the Ranch and when burning and grazing maintained larger semi-open areas. We saw one E of Kuti 13 December 1983, another in bushy, open pasture near the Main Gate 28 May 1996, and S. Njagi saw it in the same area N of the Main Gate 25 December 1998 (it is likely an uncommon resident in mixed cultivation and grazing areas to the S and E, and is resident farther E on the Laikipia Plateau, Lewis & Pomeroy 1989). Considered regionally threatened by some (Bennun & Njoroge 1999).

FALCONIDAE Falcons, kestrels

African Pygmy Falcon *Polibierax semitorquatus*

Months. September, November; two records, casual.

Notes. A casual upslope wanderer from the Lake Baringo area (Stevenson 1980), observed only at MK 13

September 1988 and 9 November 1984. S. Sassoon also reports (undated) having seen it in the study area. It occurs usually below 1600 m, but is known to wander (Lewis & Pomeroy 1989), and these falcons moved upriver, perhaps 3 km or so, to our site at c. 1760 m. It also occurs on Pinguone Ranch, to the E of the study area (Schulz & Powys 1998); Stevenson & Fanshawe (2001) reported it to 1800 m.

Lesser Kestrel *Falco naumanni*

Months. February, casual.

Notes. Observed rarely, should occur at least in migration (Lewis & Pomeroy 1989), but we have seen only c. three FF. On 1 February 1997, three FF believed to be Lessers (small, tail pointed, flying together, finely streaked below and rather pale, especially on unmarked belly) were noted near the entrance to the rubbish tip (dump); a perched F between Kuti and Center (not far from the tip) was pale below, and had white claws, 8 February 1997. Probably the same F, or one of those observed 1 February, was seen along the Center road opposite the rubbish tip 9 February 1997 (numbers of Common Kestrels were also noted December–February 1997). Also reported (undated) for the area by S. Sassoon. Listed as Vulnerable by Stattersfield & Capper (2000).

Common/Rock Kestrel *Falco tinnunculus*

Months. November–April, June; usually rare, fairly common 1994–97.

Notes. Mainly Palearctic migrant and boreal wintering kestrels were observed, c. 35 of 55 records December–April 1996–1997. On 11 June 1989 F seen flying across and then down the lugga at MB was not observed well enough to check racial characters (it had facial marks, was not a White-eyed Kestrel). One or several of those noted November–April could have been of the redder resident race *rufescens* (Brown *et al.* 1982, Ferguson-Lees & Christie 2001), but those observed well were northern birds (*F. t. tinnunculus*), and we consider all records from those months as of the nominate race. Most were of FF and immatures. One M and F flew in a tight circle, spiraling upward together over GMF 4 February 1997. A F at Kuti dust-bathed in the road, “attacking” the dust with feet and talons, strewing it over itself. “Killee, killee” and “kee-kee-kee” calls were heard several times, from FF. During the December–February period of 1996–97 we saw as many as four per day, and up to three near one another. One F was about GMF hill most of December 1996–February 1997. The kestrels were in degraded bushland and edges of woodland. One sub-

adult M netted at GMF 17 January 1995 weighed 181 g, and had wings at 246 mm. It chased a Sooty Boubou into a net. This subadult had pale rufous feathers coming in the humeral areas and gray feathers coming on the crown, back and rump, and the body areas in heavy molt. The black bill had horn at the base and yellow at the gape, with a pale yellow cere; the eye was dark brown and orbital skin pale yellow.

White-eyed/Greater Kestrel *Falco rupicoloides*

Months. November–February, June; uncommon, irregular visitor.

Notes. One of those upslope wanderers, known from surrounding areas to the W (Hartley 1986), S and E (Lewis & Pomeroy 1989, Schulz & Powys 1998) found normally below 1800 m, but reported to 2150 m by Ferguson-Lees & Christie (2001). We have six or more records; an adult was seen seven times between 20 January and 15 February 1988 about GMF, and an adult was observed five times 8 December 1991 to 26 January 1992 at various central sites (the same falcon, or two or three). Others were noted: 4 February 1997 N of Center, 26 February 1991 perched at PK, 6 June 1991 over GMF (called, a slow, perhaps double- and single-note alarm series of 10 “kwee” or “kree” notes, as “kwee-kwee, kree, kree-kree”), and 24 November 1993 hunting over PO. All were rusty medium-sized falcons with white underwings and no facial pattern; all those seen perched had cream-colored eyes.

Gray Kestrel *Falco ardosiacus*

Months. July, one record, casual.

Notes. We slowly followed an adult Gray Kestrel hunting along the road N of Kuti 30 July 1989; it flew low, then up to a perch, and after flushing it, again, and yet again, it finally bolted S at high speed. We noted its gray color with blacker wings, vague streaks on its neck and back, weak, pale barring of its flight feathers, and yellow cere, orbital skin and legs. This is a rare wanderer, with records in the Rift Valley, as at Lake Baringo, and one E as far as Nyeri (Lewis & Pomeroy 1989), usually occurring to 1800 m; our Gray Kestrel was at c. 1870 m. Possibly a pre-breeding wanderer (Ferguson-Lees & Christie 2001).

Red-footed Falcon *Falco vespertinus*

Months. April, one record, possible second; casual.

Notes. A virtually patternless gray-black, long-winged, dainty falcon went after prey in the lugga at MB 7 April 1993; it apparently missed, came back toward us, then circled and flew N. We noted its red legs,

red cere-bill base, and “rusty about thighs” (from field notes). Rare in Kenya, yet there are other April records (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996); it could not have been other than a M of this falcon. A subadult M perched for 10 min W of Big Dam 13 April 1995 was of either this species or, much more likely, an Amur Falcon. It had adult M features in some gray on the sides of the head; blotches of gray and streaks of white below, some rufous under the tail, and a tail with mixed black feathers and barred, immature feathers (see Porter *et al.* 1981)! Its legs were orange, the cere and orbital area yellow. As it flushed we observed mixed gray and brown upperparts, and barred white underwings (first-year MM molt wing feathers in their second, boreal summer). Unfortunately the diagnostic white underwing coverts of M Amur Falcons are not yet present in MM of this age (see, e.g., Cramp *et al.* 1980), so we could not be certain of its identity, but its features marked it as either an Amur or Red-footed Falcon.

Northern Hobby *Falco subbuteo*

Months. March–April, November–December; casual.
Notes. One subadult (no rust below, pale-edged feathers above) 21 November 1988 at MB (perched, clutching a mouse) was our only boreal autumnal record. An adult (late boreal autumnal migrant) was at Posho Corner, hunting low over bushes 31 December 1996. The rest of the (11) records were 30 March to 23 April of four years, especially 1993. Three of these were of single falcons perched or hunting low; the remainder were in loose groups of two to six seen at the edge of rain or immediately post-rain, hawking insects along hill slopes. Probably a number moved through 15 April 1993 when we observed three criss-crossing over the GMF slope, generally moving NE, then two more, and then two more, all within 15 min. Four briefly harassed a Martial Eagle high over UL 21 April 1995; we later saw one perched near Center the same day. Most migrate over at a high altitude (Brown *et al.* 1982, Lewis & Pomeroy 1989).

African Hobby *Falco cuvieri*

Months. April, July, October; casual visitor.
Notes. Rather few observed, three in November–December of 1986 and 1988 were barely glimpsed flying into luggas or flashing through trees overhead, that remotely could have been Northern Hobbies, most of which are however, seen flying in the open. None showed white about the head that marks *F. subbuteo*. A rusty-below, splorched immature was perched briefly at UL 18 October 1992. An adult perched near Posho

Corner 10 April 1996. On 14 July 1998 an adult was perched S of Center; perhaps the same falcon zipped through EG 21 July 1998, chased briefly by breeding Rueppell’s Long-tailed Starlings. These likely represent wanderers from the S or W (Lewis & Pomeroy 1989); has occurred April, May, and July in the Baringo area (Stevenson 1980). We are uncertain why this hobby is so sparsely distributed in the region.

Lanner (Falcon) *Falco biarmicus*

Months. January, March–July, December; irregular visitor.

Notes. Seen yearly through 1992, in only three of six years since. Possibly attracted to human habitation, as multiple site records about Main Center and its rubbish tip, and about Nglesha. Its presence about dams created havoc among waterbirds and pigeons. An adult attacked an African Goshawk diving at a chicken at Center 5 June 1992; as the hawk sped off the invader went after the chicken, but was driven off by five-six shouting humans. The Lanner then circled upward, where it was joined by a second and both spiraled out of sight. Two other June–July sightings in 1992 may have involved one of these Lanners. The only other pair observed were perched in the top of one of several remaining tall *Acacia gerrardii* trees N of Center 9 July 1991 – this could have been the same pair seen in that area in 1992. The smaller M had a brighter yellow orbit, and more yellow cere area than the F. They may have roosted there, accompanied by starlings that often roost near raptors. One perched on GMF slope 6 December 1994 was mobbed by a F Pallid Harrier for 2 min; it was flushed by the harrier. None of the 15 or so birds seen was obviously a juvenile; their spotting below varied (FF have more marking than MM, Brown *et al.* 1982), but most seemed to represent the ventrally sparsely-marked race *F. b. biarmicus* rather than the more heavily marked *abyssinicus*. It is resident at Lake Baringo (Stevenson 1980) and occurs in all surrounding areas (Lewis & Pomeroy 1989). Not seen sufficiently consistently to suggest breeding locally; the presence of the escarpment may attract wandering Lanners.

Peregrine (Falcon) *Falco peregrinus*

Months. December, January, April–July; irregular visitor.

Notes. C. 11 occurrences, a few perhaps of the same individual, not seen yearly. At least two of three January records were of the N race *F. p. calidus*; a pair of this pale, ventrally white and finely barred form with its fine malar streaks, were in the mud on the shore

of Big Dam 8 January 1995, apparently drinking. The M left but the F stayed for *c.* 11 min. Two April and one December Peregrines were also of this subspecies, whereas five May–July birds seemed to represent the local, dark, small, well-marked resident race *F. p. minor* (see Brown *et al.* 1982). The records include an immature, likely F, that landed, bathed and drank at Center Dam 15 May 1996. Possibly the same immature flew about over SI 9 June 1996. One adult perched at SI for 10 min 5 May 1993; we could see the broad malar mark, and some buff below. Presumably the records of local Peregrines are of wanderers, probably from the S; breeding in our region centers upon August (Brown & Britton 1980). Peregrines of the Palearctic *calidis* are the size of Lanners, and local *minor* is smaller (Brown & Amadon 1968, Brown *et al.* 1982, Ferguson-Lees & Christie 2001).

ANATIDAE Ducks, geese

Fulvous Whistling-duck *Dendrocygna bicolor*

Months. February, May, July–August, December; irregular visitor.

Notes. Only six records, vagrants generally not tarrying, except for one at Center Dam 25 July–26 August 1986. Others were: one with Pintails at Center Dam 13 February 1988, nine at Big Dam 10 May 1993, two at Center Dam 26 August 1987, one on an islet in Big Dam 13 December 1995, and seven on Big Dam shore 21 December 1994. Likely these were vagrants from the Lake Baringo region, where it occurs in all months (Stevenson 1980, Lewis & Pomeroy 1989). We likely miss this duck and the next species because they tend to be in weedy or grassy “backwaters.”

White-faced Whistling-duck *Dendrocygna viduata*

Months. January, July–August, December; irregular visitor.

Notes. About seven records; three at Center Dam 3 August 1987, and four there two days later, and three at Center Dam 1 January 1988 and four there 4 January 1988, involve repeated sightings of some of the same birds. Groups of up to seven, and single birds constituted all but one record, that of *c.* 30 clustered in pairs about Center Dam 21 to 25 July 1988. Most were at Center Dam, two groups were at Big Dam, and five flew SW over GMF 15 December 1993. Some of these months are within periods of breeding (e.g., January, July–August; Brown & Britton 1980), so the sightings are apt to be of non-breeding wanderers.

White-backed Duck *Thalassornis leuconotus*

Months. All but October–November, irregular but in numbers when present.

Notes. Associated with floating weeds, especially *Potamogeton thunbergii* on Big Dam, seen only twice elsewhere (Center, Nglesha dams). Often associates with Red-knobbed Coots; like coots absent when water is muddy and silted, as after heavy rains, and absent in some years, as 1998. Presumably non-breeding visitors (Brown *et al.* 1982), they are usually in flocks but associate in pairs. One flock of 20 to 26 remained on Big Dam 4 January to early April 1997; from six to 34 were present there 18 April–26 August 1996 (we could not tell if these were always the same birds). Other groups seemed to stay for four to six weeks, including a group fluctuating between 38 and 68, 6 January to 5 February 1992 (seen on nine days). The ducks dive for food in or near the weed-beds, and sleep within them. Months of greatest number of occurrences are: December, July, January, April, June, and August in descending order. Since it breeds at diverse times (Brown *et al.* 1982) it could occur at any time. We have seen no signs of breeding, although they occasionally engage in chases. Some (Bennun & Njoroge 1999) treat it as regionally threatened.

Egyptian Goose *Alopochen aegyptiacus*

Months. Common resident.

Ecology. This aggressive goose is present in varying numbers at the larger dams, and is often seen at small dams; it grazes on pastures, and about temporary pools and springs. In most years pairs are found along the Mukutan River, defending sections of it in a holding action for eventual breeding. The geese associate with domestic animals, especially donkeys, and with other waterbirds and guineafowl. They are preyed upon by fish-eagles, clustering into a dense flock when eagles are near. They have to beware of mammalian and reptilian predators when nesting, e.g., eight on an island at Titus Dam called and waved wings at a 1.5 m-long *Varanus* monitor lizard that swam out to the island, but could not drive it off.

Movements. Most geese are but visitors to the dams. On 2 January 1997 there was no goose at Dirty Dam early in the day; an estimated 450 were there when we passed the dam that afternoon. That dam particularly seems to draw geese from dams in the cultivated areas S of the study area. Numbers are greatest November to April; at times upwards of 1000 are present on the largest dams. We saw over 300 geese at Big Dam 2 July 1995, but such numbers are rare

in May–October. Probably no more than 30 to 100 pairs actually breed in the study area.

Behavior. Geese in pairs along the Mukutan River intercept low flying geese that invade their area, giving chase. Invaders may be persistent, and wing smashing battles and supplanting attacks may recur for up to a week. At the SI site three or four pairs compete so forcefully, even landing on each other's nests, that few young may be produced. The wings are used against predators, such as a persistently attacking F Eurasian Marsh Harrier. Very vocal, and heard at some distance; calls a dominant sound in African wet areas.

Breeding. In some years, as in drought year 1984 no nesting is attempted. Small (downy) young have been seen March–January, with July perhaps the peak month. At dams pairs may breed in secluded corners; even at Big Dam there rarely are two broods of the same size/age, and new broods may be seen over 9–10 months. Old nests of Hamerkops are favored sites, and nests of hawks, eagles and eagle-owls are also used (the geese may have to confront a pair of raptors). Some nests are up to 1 km from water, as at Sipili. We have seen up to 14 downy young in a clutch; some pairs rear up to 13 to half the size of adults, but most end up with one to three fully grown young, and some lose all of them. When raised away from dams, young remain at the nesting area until they can fly (*c.* 11 weeks), and families then move to dams, where the young remain near parents until they acquire the adult dark eye patch, pinkish bill and legs, and orange eyes, at *c.* 5 months of age (Brown *et al.* 1982).

Ruddy Shelduck *Tadorna ferruginea*

Months. December; one record.

Notes. With Dickson Chepus we saw a F of this unmistakable shelduck, with which the authors are familiar, at Big Dam 20 December 1986. We walked about the dam, watching it swim near the shore. It breeds to Ethiopia and in the boreal winter reaches Sudan and S Ethiopia. It has occurred as a vagrant in Kenya at Lake Turkana in the 1950s: likely coming S with other ducks (Britton 1980), ours is the second record for Kenya (Short *et al.* 1990). Its close relationship with the South African Shelduck *T. cana* (del Hoyo *et al.* 1992) implies a former connection between them through East Africa.

Spur-winged Goose *Plectropterus gambensis*

Months. January–February, August; now irregular visitor, perhaps regular in past.

Notes. This widespread goose reportedly (*fide* C. Francombe) was more or less regular on larger dams Ja-

nuary–March; S. Sassoon (*in litt.*) saw it at Big Dam 9 to 15 February 1985 and in late January 1988. Our three records for the 1980s are a M seen closely at Nglesha Dam 20 February 1986, a likely F out on Big Dam 18 August 1987, and an F seen closely at Big Dam 19 January 1989. In the 1990s, we saw only one, a likely F at the far S end of Big Dam 13 August 1997. It is frequently observed as a wanderer in highland waters (Lewis & Pomeroy 1989); perhaps frequent silting of the dams in recent years has made them less attractive to this goose.

Knob-billed/Comb Duck *Sarkidiornis melanotos*

Months. January–February, April–August; irregular visitor, recently more frequent than last species.

Notes. S. Sassoon (*in litt.*) has observed this duck in a number of years during January–March, including one in late January 1986. It is also known at Mutara Ranch to the SE (Olson *et al.*, undated MS). Our records are of: a F 17 and 19 January 1989; a likely F at Nglesha Dam 20 February 1988; a F 3 April 1998; four including at least one M 13 May 1992; one flying near Dirty Dam 25 June 1991; one F at Center Dam 3 July 1986; three MM 5 July 1993; and a visiting 1997 F observed 10 August, 20 August, and 24 August at Titus Dam (unspecified sites are Big Dam). Brown *et al.* (1982) noted the frequent separation of the sexes when not breeding; it breeds to the S of the study area, with seasonality ill-defined (Brown & Britton 1980, Lewis & Pomeroy 1989).

African Black Duck *Anas sparsa*

Months. One December record; casual.

Notes. One shot at Lugwagippe Dam 28 December 1994 (wing speculum saved) by J. Heath. A vagrant from highlands to the S, occurs to the S and E of the study area, including Mutara Ranch on the Laikipia Plateau (Olson *et al.*, undated MS, Lewis & Pomeroy 1989). Favors flowing streams in forest, not found in the study area.

Eurasian Wigeon *Anas penelope*

Months. December; sporadic visitor.

Notes. Observed during December 1986 at Big Dam among Northern Pintails, one M; a pair were with pintails at Big Dam 30 December 1989. S. Sassoon has several (undated) records on her boreal winter visits to the Ranch. Small numbers of this Palearctic duck spend November–February in the Kenyan highlands (Lewis & Pomeroy 1989), and have occurred about lakes Baringo and Bogoria (Hartley 1986).

Although we do not list it as a definite record, one grayish-headed duck with a small white wing specu-

lum seen in flight among 200 ducks at Big Dam 23 December 1993 almost certainly was a Gadwall *Anas strepera*, a rare Palearctic visitor to Kenya.

Green-winged/Northern Teal *Anas crecca*

Months. December; uncommon visitor from Palearctic.

Notes. A pair were on shore at SE Big Dam 21 December 1994, and a pair were seen among other ducks at Big Dam 13 and 31 December 1995. It is a regular December to March visitor to highland Kenyan waters, known from nearby lakes Baringo and Bogoria (Hartley 1986, Lewis & Pomeroy 1989). MM are highly distinctive.

Cape Teal/Wigeon *Anas capensis*

Months. January; casual.

Notes. One pink-billed, pale gray-headed brown duck of this species was on shore, beside an avocet, 10 January 1996 at Center Dam. A breeding resident and wanderer about the Rift Valley, known from lakes Baringo and Bogoria (Hartley 1986, Lewis & Pomeroy 1989), and reported from the study area by S. Sassoon (undated records).

Yellow-billed Duck/Yellowbill *Anas undulata*

Months. Resident.

Ecology. Reasonably common if shy and unobtrusive, easily missed amid any vegetation, and undercounted. Favors temporary pools and ponds, dam walls, wet seepage areas below dams, backwaters of large dams, rarely on the river. Usually in pairs, even when in flocks, may rest on dams in pairs; occasionally up to 20, less commonly to 50 and even 100 or more in March–April. Appears at temporary pools with grasses and marsh after rains. All seen closely had the green speculum of the nominate race (Madge & Burn 1988).

Movement. There is probably some movement into and out of the area, to account for the sizes of some flocks; local movements do occur (Brown *et al.* 1982, Lewis & Pomeroy 1989).

Behavior. Difficult to observe. Nesting adults tend to run through grass, and not fly.

Breeding. Sneaking adults alone or in pairs about temporary pools, and back from dams (as far as 1 km) are seen May–July, and one to nine small young have been observed only July–August. By August–September young are near adult size, told from adults by dull, dusky yellow bill (not mentioned in references is that breeding adults of both sexes have a gold to orange-

yellow, bright bill). Small groups of up to eight on dams October–December may be family parties. Breeding takes place about the predictably occurring July–August rains, with eggs laid in June–July. We have observed no nesting results outside this period, regardless of seasonality of rains in any particular year.

Northern Pintail *Anas acuta*

Months. November–March; almost regular boreal winter visitor.

Notes. Usually the commonest of the N ducks that visit Big, Nglesha and Center dams. In “good” years as many as 150 may occur on Big Dam. In 1995–1996 there were at Big Dam *c.* 40 on 8 December, over 200 on 13 December, then 150 to 3 January, dropping to 100 on 7 to 13 January, 10 on 26 January, two on 31 January, then 50 on 3 February 1996. Small flocks often have a preponderance of one sex, but numbers of MF are about equal in larger flocks. Other ducks feed with them, and, when dabbling behind marsh grass at S Big Dam, it is difficult to conveniently check numbers of pintails, and other ducks mixed with them.

Red-billed Teal *Anas erythrorhyncha*

Months. Usually common resident.

Notes. More often in small to large flocks (rarely to 200) than is the Yellowbill, and young rapidly grow to adulthood, so breeding records are sparse. Gravitates to small ponds and temporary pools to breed in pairs. Breeds about Center, Big and Nglesha dams, with two to six young seen with parents late July–September, and in December. Once the young with their parents join flocks they are difficult to distinguish at distance. A pair within a flock were courting, with circling and bobbing (head-pumping display, Brown *et al.* 1982), bridling and bathing of one of them, 20 June 1997. Breeding likely occurs mainly June–September, with some breeding beyond September, to December in years with substantial July–August rains persisting into September and October, as in 1992. Thus breeding is slightly later than the May–August given by Brown & Britton (1980). Certainly more occur in April–May flocks than breed in the study area, so local movement is likely (see Lewis & Pomeroy 1989).

Hottentot Teal *Anas hottentota*

Months. July, August, December; casual visitor, scarce.

Notes. Noted in relatively few years considering how widespread it is in the highlands (Lewis & Pomeroy 1989, Short *et al.* 1990); seen in July–August in 1987,

and again in 1989, and in December 1983, 1987, 1989, and 1993, at Center and Big dams in numbers up to 12. Often associates with Red-billed Teals and perhaps missed among them sometimes. S. Sassoon has observed this duck in the study area (undated records) during December–February visits.

Garganey *Anas querquedula*

Months. November–April, more frequent in recent years.

Notes. Perhaps a regular visitor with most records in April (to 27 April, on the last date in 1996, five MM and three FF were at Big Dam). Most were in small groups but in flocks to 25 in April, and over 50 in November. This Palearctic duck is too distinctive to miss, although in small numbers readily escapes notice in vegetation of S Big Dam. Relatively common in the highlands October–April; moves about frequently, as it only occasionally remains for more than two to three days at most.

Northern Shoveler *Anas clypeata*

Months. November–December; irregular and uncommon visitor.

Notes. Observed in only five years, all records 30 November–30 December. Usually seen in small groups, occasionally 20, once *c.* 30, all at Big Dam where feeding in the shallow, sometimes grassy S end. One M was present for 11 days, and five shovelers were seen on five days in December 1986. Perhaps favors higher lakes and dams to the S of our area, may be abundant about Rift Valley lakes (Lewis & Pomeroy 1989).

Southern Pochard *Nettion erythrophthalma*

Months. All but March; regular visitor in varying numbers.

Notes. Very dependent upon water depth and clarity, diving ducks are less common than are dabbling ducks, and they frequent only the larger, deeper permanent dams. Months of greatest occurrence are December–January, and July. Usually seen in small groups, to 8–10, or singly, up to 50 or even 60 in December–January. Displaying pairs with MM cocking the tail were seen at Nglesha Dam 28 December 1989, but, other than usual occurrence in pairs, we have no other indications of their breeding. The apparent influx of Southern Pochards in November–January is in accord with information from Lewis & Pomeroy (1989), although these months are unlikely for migrants from S Africa that ought to be in the S at that time (Maclean 1993).

Common/Northern Pochard *Aythya ferina*

Months. One January record, casual.

Notes. Close to the dam wall (and road) at Center Dam 21 January 1980 were two MM of this pochard in full plumage, hence unmistakable. We were sufficiently close to see the pochards' red eyes. It has straggled as far as Tanzania, and there is a record from just S of us at Ol Bolossat, near Nyahururu (Brown *et al.* 1982, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996).

Tufted Duck *Aythya fuligula*

Months. Two January records; casual.

Notes. A lone M was diving in Center Dam 22 January 1986; a M and two FF were at Center Dam 3 January 1987, and again the morning and afternoon of 4 January 1987. This Palearctic duck uncommonly but more or less regularly reaches the Kenyan highlands November–March (Lewis & Pomeroy 1989). The first record curiously was at Center Dam the day after two M Common Pochards were observed there; the latter were absent on 22 January, implying some movement of “wintering” diving ducks at that time.

Maccoa Duck *Oxyura maccoa*

Months. April, July–September, November–December; casual visitor.

Notes. Observed in only six years, mainly on Big and Center dams, a few at Nglesha Dam, singly or in pairs, up to 12 ducks, except a flock of seven FF (or FF and juveniles, see Brown *et al.* 1982) at Nglesha Dam 18 December 1989. One F was observed 18 April 1993; the rest of the records are from the latter half of the years. During July 1986 three to six pairs were at Big Dam throughout the month. Mainly aggressive displays were observed involving three pairs at Center Dam 18 August 1996, between two MM beside a F 18 August 1987 at Big Dam, and two MM displayed with three FF present 23 December 1989 at Big Dam. Also observed in the study area by S. Sassoon (undated records), and occurs on Mutara to the SE (Olson *et al.*, undated MS) and at lakes Baringo and Bogoria (Hartley 1986). There are no indications of breeding (March–October according to Brown & Britton 1980); although noted as resident by Brown *et al.* (1982) and Zimmerman *et al.* (1996), it obviously wanders N from its Kenyan breeding centers (see Lewis & Pomeroy 1989, see also Madge & Burn 1988). Some think it threatened regionally (Bennun & Njoroge 1999).

NUMIDIDAE Guineafowl

Crested Guineafowl *Guttera pucherani*

Months. Rare resident in remnant forest at Nglesha.

Notes. Perhaps our most unexpected find was of at least one flock of c. 12–15 Crested Guineafowl in the *Croton-Ficus-Olea-Juniperus* forest remnant at Nglesha. We first heard about “Turkana-warrior head-tufted” birds there in 1990. They were not about our site at NG, which was in *Acacia abyssinica* riverine woods, nor did we visit NG very often. We began finding Crested Guineafowl feathers in the forest patches, e.g. 30 May, 17 October and 9 November 1992. We found more feathers in 1993 and S. Njagi glimpsed several birds near the lower Nglesha Dam in May of that year. B. Heath reported hearing this guinea fowl there 3 to 5 April 1994. Finally, 28 December 1994 one was taken from a tree near water at NG. The meat and organs were eaten, so we got the skin only, but the head was untouched and skin about the head still bright blue and red. Its eye was red, its mouth blue, the head tuft moderate in height, and it had a narrow black neckband. The head skin was more extensively red than in typical *pucherani*, the facial red connected the gape with the extensively red throat; the blue angled from the nape toward the gape in front of the ear, the side of the neck below being blue in the rear, and red for nearly half of the width of the neck in front. This represents a considerable extension of the range of *G. p. pucherani* to the NW (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996), and the Nglesha birds are by distance closer to populations of *G. p. edouardi* of the Rift Valley and W Kenya than to *pucherani* populations to the S and E.

Helmeted Guineafowl *Numida meleagris*

Months. Common resident.

Ecology. Favors edges, open areas, pastures, and bushland, but forages almost everywhere; requires suitably tall tree in which to roost. Lives mainly in groups of eight to 20 (after breeding these may double in size), formerly gathered in flocks to c. 200 (Nglesha cultivated area), in 1990s rarely more than 50. Even when breeding, most guinea fowl remain in flocks, including subadults, later prospective breeding adults and non-breeding birds. It associates with grazing and browsing mammals, especially elephants, various antelopes, zebras and warthogs. Drongos and various starlings pick up insects fleeing from the moving guinea fowl. Guinea fowl flying parallel to our vehicle have been

noted at speeds of up to 30 km per h. They are preyed upon by Verreaux's Eagle-owls, Martial Eagles and other large raptors, and numerous mammalian predators, e.g., caracals *Felis caracal*. Regularly shot in small numbers for the table by owner of ranch.

Behavior. Well known.

Breeding. In most years breeding commences May–August; in a few years it did not commence until September, as in 1985, 1989, and 1995, and probably 1983. In six years (1983, 1985, 1989, 1994, 1995, 1997) breeding, as indicated by the occurrence of downy young, took place in December. Pairs often from April–June, with the earliest downy young seen in May 1990; even in late years of breeding, as 1995, a few pairs may breed earlier. MM on “song” perches (stubs to 7 m, stumps and termite mounds) are observed in May–June of most years, so pairs may form but delay breeding if the big rains of April–May are poor. One nest observed closely 13 June 1992 was of grass under a bushy tree in low bushland near a temporary swamp at acacia crossing. The 12 buff-tan eggs were diversely sized, with or without fine brown spots. The eggs hatched safely by 15 June; seven shells sufficiently intact to allow measuring their width were 37–39 mm (38.5 mm). In 74 broods we saw with downy young, the number was one–15; all groups of six and more were of tiny hatchlings. Half-grown young typically number only one to five, and at this size they and their parents rejoin a flock, which often has diversely-sized young but no similar-sized array of young numbered more than five. Frequently we saw small, even downy, young accompanied by three to six adults. Whether of one or more broods these groups indicate that predation is severe. Large flocks seen October–January often 30–50 % of subadults, so adults of such groups in the short-term produced up to one bird each. In time the subadults likely are the majority of flock members taken by predators at tree roosts (they may be forced to use more exposed perches) or when feeding. Two downy young unable to fly weighed 67 g and 67.5 g on 28 June 1988; this is c. twice the hatching weight of 24–34 g (Urban *et al.* 1986), so they were one to two weeks old. With only 29 records for the region including the Laikipia Plateau, Brown & Britton (1980) noted breeding in 10 of 12 mos, with May–July and December peaks. Our observations showed breeding April–January overall, the major peak being July–August, with some years in which the season is August or September–January.

PHASIANIDAE Quail, francolins, spurfowl, partridges

Harlequin Quail *Coturnix delegorguei*

Months. April–January, mainly May–November; visiting breeder in some years only.

Ecology. Absent in drought years, and in some years of reasonable rainfall (e.g., big rains March–June were similar in pattern in 1985 and 1987, but quail appeared only in 1987). Large numbers bred maximally in five years, less in four years, and none or one pair only in seven drier years (1983–85, 1991–93, and 1995). Favors lush, dense grassy areas after recent rains, as Lewis & Pomeroy (1989) noted, rather than open, low grassland mentioned by Urban *et al.* (1986). Initial incoming quail are widely scattered and not necessarily in favored habitat; as more appear, wet grassy areas, usually near water, become saturated, with up to six singing MM per ha, rarely eight, but never reaching the 10 per ha Johnsgard stated (1988). Occurs to 2100 m; Madge & McGowan (2002) had it below 1500 m generally.

Movements. Nomadic not fully understood, never resident in our study area, although nearly so at Nglesha in some years (see Urban *et al.* 1986, Johnsgard 1988). Can arrive initially April, May, July, August or September, in years of appearance.

Breeding. Varies, commonest period July–September, may be May–September in one year, August–January in another, these as indicated by singing MM, presence of pairs, and sparse observations of downy young numbering one–12 in July–September. One F had 10 small young just able to fly 22 September 1996, and another F had 12 such young in early September 1994. Breeding is heavily influenced by July–August rains; Madge & McGowan (2002) dates reflect only big and little rains.

Stone Partridge *Ptilopachus petrosus*

Months. Rare resident in W, only old records August, December.

Notes. Not seen since the inception of the project, this species formerly was common in the rocky slopes about Mukutan Gorge where Horne saw it in the 1960s. Short observed two on the slope opposite our MK site 4 August 1977, we saw two just downstream from that site 27 December 1982, and we again saw one in the Gorge 500 m W of the MK site 24 December 1983. It probably is at its altitudinal limit of c. 1500 m (Britton 1980, Urban *et al.* 1986, Madge & McGowan 2002) in the very rocky W edge of the study area where we saw it to 1760 m. It is known

to the E about the N Ewaso Nyiro River, and Lewa Downs (Lewis & Pomeroy 1989, Short *et al.* 1990, Zimmerman *et al.* 1996). Horne knows its voice, and we have not heard it during the project, but we very rarely were in the Gorge.

Shelley's Francolin *Francolinus shelleyi*

Months. Resident in suitable habitat throughout study area.

Ecology. Favors *Combretum* grassland, now much given to bushy grassland with *Euclea-Carissa-Olea* thickets, especially on slopes. Fire at least initially is detrimental, favoring Yellow-necked Spurfowl. Very shy, flushes short distances, keeps in grassy cover. Its main call is very distinctive, and when singing, very easily distinguished. It digs in large piles of elephant dung (containing many seeds, and termites), and one seen in cornfield at Nglesha.

Movements. Not found near GMF until 1992, so perhaps dispersing francolins move as much as several km from where raised.

Voice. Sings (calls) mainly at dawn and dusk, but also during light rain and following rain. Song locally best expressed “a-week-tee-teete.” Also heard are “wee” contact calls at UL, not noted by Madge & McGowan (2002).

Breeding. As indicated by “song,” April–September and December–February. A likely nest with a few leaves and eggshells (eggs unmarked cream-colored), dug out slightly under a bush at UL 18 June 1992, almost certainly was of this species. Small young have been glimpsed with adults May–September and subadults with adults (dully colored, markings less regular, bill more dusky at base) seen August–September, and also January. The young numbered only two to three in all cases. Brown & Britton (1980) had sparse breeding records for March and July for the region. Breeds following rains, not in dry season (see Madge & McGowan 2002).

Crested Francolin *Francolinus sephaena*

Months. Common to abundant resident.

Ecology. Occurs in family groups, these smaller or mainly of pairs after poor breeding seasons. Groups are of three to five, rarely eight. Early in the morning, as many as 14 groups seen in 6 km of road. When cold, and dew is heavy, often found crouched in elephant dung on road, not necessarily feeding. Found in edges, woodlands, thickets, bushland, sparingly in sparsely wooded or bushy grassland and dense (forest) trees. Feeds on insects, seeds and fruits; at camp eats papaya and mango fruit rinds, and works over dry-

ing beeswax for waxmoths and their larvae. Roosts clumped together by group in bushes and trees, usually dense, and to c. 4 m tall. Occurs with Stone Partridge, Hildebrandt's Francolin and Yellow-necked Spurfowl, less often with Shelley's and Scaly francolins. Occurs to 2100 m, and in E at 1950 m near Nanyuki; Madge & McGowan (2002) gave it as mainly below 1500 m.

Behavior. Breeds in pairs, rarely in trios, MM aggress, erect small crest, strut and fight. MM sing from low bush perch, a small tree, or a mound, or from ground, in duets with FF at times, and countersing. Apparent M lay on side in road 31 August 1987, one wing spread out over a juvenile, sunbathing; second adult, presumed F, appeared, followed by another youngster. The first adult suddenly rose, lowered its head, charged the second (with both chicks following), which turned and crouched; the first then mounted the second, copulating for 12 s.

Voice. Very vocal, its raucous calls being part of the background sounds. Heard throughout the year, but when not breeding, may be restricted to early morning, and sometimes evenings. "Songs" heard during the night when breeding, and over the years, in April–February. We heard as many as 10 calling pairs at night about GMF on 1 February 1998. Its vocalizations are not adequately treated by Urban *et al.* (1986), Johnsgard (1988), Maclean (1993), and Madge & McGowan (2002). Duet song involves one adult calling "skeek" or "shweet," the other uttering a "tchatchat" or "ka-chok." Close up members of a group utter frequent "eet," "eet-eet" and "yope" or "yup" notes. A F near a preening M gave plaintive whistles "peew" or "preew," with throat pumping, and also cackled a "pa-kukukukuda." The alarm call is a repeated "kreek-it," or by a young francolin a "ya-kit." Lone young francolins call "wee-ew," and soft "wee-ee-ee-ee" notes also have been heard. The "wee-ew" or adult "peew" is an insistent, ventriloquial whistle.

Breeding. Over the years in all months, the season being none to two mos in duration in poor years such as 1984 and 1995, and three to as many as nine mos when sufficient rains occur in two or three of the rainy seasons. Madge & McGowan (2002) gave May–July as its Kenyan breeding season. In 1990 the season (based upon downy young being seen) was February–August; in 1994 it was August–February. Overall the predominant months of breeding are July–September, with breeding in half the years in June–October. Thus, there is a major peak in the July–August rainy

season and following it (these are the regular "dam-filling rains" as they are called locally). Urban *et al.* (1986) gave the usual clutch size as six, with more in southern Africa, although Tarboton (2001) noted the usual clutch in that region as five or six eggs. Of some 150 broods we observed, totals were one to seven, with five or more in but 10% of the cases (these are of young less than one-third adult size). One buffy white egg picked up (slightly addled) 29 January 1994 measured 38.5 x 29.8 mm and weighed 18.7 g, within the range of its measurements (Urban *et al.* 1986). *Specimen data.* A M starting body and wing (first primary) molt weighed 306 g 20 July 1991. A F netted with a juvenile weighed 290 g, the juvenile 76 g, at EG 11 December 1988. Subspecies *F. s. granti*.

Scaly Francolin *Francolinus squamatus*

Months. Resident in small numbers at Nglesha in dense woodland.

Notes. Heard occasionally on our irregular trips at the NG site; often we arrived after their early morning calling. Less numerous than smaller Crested Francolin, readily told by its red bill and brighter red legs. Stays in dense riverine woodland undergrowth which Crested does not penetrate. S. Sassoon (undated record) first called our attention to its presence at NG. Heard there April–August, voice recorded 27 August 1993 (call mainly "ker-RAK," repeated, also duck-like "kwek-kwek" notes, and "rek-rek-rek-REK-REK-REK" increasing in volume, see Urban *et al.* 1986); from a pair that readily came to playback one called "tak, tak, TRRAK, RRR-RAK," the other, "peep-put, PEE-put, KUT-KUT." Observed, but not calling four times in April, July, and August, once a single adult with a Crested Francolin group. Habitat very restricted; its continued occurrence is dependent upon habitat preservation.

Hildebrandt's Francolin *Francolinus hildebrandti*

Months. Local but common resident.

Ecology. This large heavily built francolin keeps to bush and thicket cover, often runs from cover to cover, and only occasionally forages in the open, e.g., in elephant dung, which it picks apart with its bill, rather than kicking it as do the other local francolins. It favors woodland and bushed woodland near water (Madge & McGowan's 2002: 50 "upland shrubby grassland with rocky hillsides" is misleading as it is rarely away from woodland cover), and generally is less numerous than Crested Francolin and spurfowl. Occurs rather strictly in pairs and family groups, although a sub-

adult accompanied a pair with small young. Drinks regularly, frequently seen on dam walls. More often heard than seen.

Voice. Loud song, a “kut, kut, ke-dit, ke-dit” (also “kwik-at, kik-ek,” and “ta-bot, ta-bot, ta-ṛbot”), is heard early and late in the day, presumably mostly in the breeding season. We have heard songs in every month, but within a given year they are uttered over a two- to seven-month period varying yearly. July–August are the peak months for song in most years, but in some years ceases before July or commences in or after August. Song in 1987 August–February, in 1994–95 November to May, and in 1996 May to December, as encouraged by rains. Also utters “chuk” or “chuff” notes, and snarl-like calls during interactions or when disturbed. Sometimes makes a wiffing sound, probably vocal, when taking off, possibly a contact note.

Breeding. Judging from singing usually commences May–August, depending upon the nature of the big rains of April–May; or begins with July–August rains, continuing onward or not; or starts with little rains, continuing into the next year. About 15 records of downy young support this regime of breeding. Young seen numbered one to six. On 5 January 1995 N of Center we saw an adult M and F, a subadult M with dull yellowish (no orange as in adults) bill and four downy young going into juvenal plumage; in the same place by 6 April we saw the pair with three full-sized immatures. MM are more heavily black-marked below, and have thereby less white than illustrated by Urban *et al.* (1986) and del Hoyo *et al.* (1994). We have found no sign of Jackson’s Francolin *Francolinus jacksoni*; it occurs *c.* 15 km S of the study area, more in highlands toward Nyahururu.

Yellow-necked Spurfowl (Yellowneck) *Francolinus leucoscepus*

Months. Common resident.

Ecology. Favors pastured bushland and woodland, bushed grassland with low grass or bare ground, pastures, old bomas, and vicinity of habitation and cultivation. Conspicuous, yet often shy; often “freezes,” runs rather than flies. The largest of the francolins in the area (Urban *et al.* 1986), it replaces Shelley’s Francolins where overgrazing or fire lowers the grass level. It chases after termites when available. Works over dung of elephants kicking it backwards as the francolin turns in a circle within it; feeds in cornfields. Roosts in tree or bush to 4 m. Stolid, not aggressive, walks past Hildebrandt’s and other francolins. Drinks

at dams and streams at times, though can supposedly go without water (Johngard 1988); drinks less often than do Crested and Hildebrandt’s francolins.

Behavior. Crows (sings) from termite mound, fence post, small tree or bush. Courtship displays as given by Urban *et al.* (1986), but neck of M not arched.

Voice. Crowing song starts with a warm-up, “brrrrr-rr-rak, burr-rak, bur-rrraak,” then the crowing “grraak-ik” or “krek-ik” notes. This is heard in any month early in the morning, as the pairs likely are territorial, but when breeding is uttered mornings, evenings in response to calling of another, and especially following rains. Also heard were: an alarm call, “weeeee-ooo,” or “weeeee-ow” or “peeee-a,” given at raptor over-flights and in presence of an eagle-owl; and “kluk” alarm or mobbing notes at a snake.

Breeding. About 30 broods of downy or juvenal young (to 50% adult size) have been noted in all months except February, though July–August is the average peak period. The season can be short, e.g., March–May in 1995, but usually is longer, May or July–December or January, in some cases. Persistent, repetitive crowing (rarely crows at night) and some observations of courtship support seasons of April–May to January, although courtship in January 1997 suggested January–February breeding. Possibly may breed in two seasons, e.g., January–March and August–October in 1997. In April 1995 we observed two adults, four subadults (dully yellow throat, no red chin, two with tiny spurs, more barred above) and two juveniles about half the size of the others, suggesting consecutive breeding. We note that adults have a bright yellow throat, brighter in MM, and a red chin, shown in Urban *et al.* (1986), but omitted from most field guides. The peak in May–July for breeding of this francolin given by Brown & Britton (1980) probably has no Laikipia, triple rainy-season records included. Broods numbered two to six, but one F at Saddle Boma 27 July 1987 was with nine half-grown young (possibly a second F was involved in the nesting; see Urban *et al.* 1986 for two FF laying 17 eggs in one nest).

TURNICIDAE Button-quails

Common Button-quail *Turnix sylvaticus*

Months. All months except March; breeding visitor, some may be resident.

Notes. Most records (*c.* 35) June–September, but 15 records scattered in five mos of October–May, in bushed grassland, grassy edges of bushland, and grassy

areas back from dams. Usually seen at edge of, or in road, in the central to NW parts of the study area (S and E to Center Dam region and once, LU), with most records in the grassy hills among UL, GMF and MB. Songs, a clear indication of breeding (Tarboton 2001), have been heard frequently in June–July and, after rains, in October 1992. Overall, songs have been heard May–August and October. Other evidence of breeding activity includes: flushing of two apparent MM within 50 m 13 July 1998; pairs, the M and F close together W of Center Dam and S of acacia crossing 15 July 1998, as well as at MB 23 December 1996; and a M accompanied by two immatures at MB 9 July 1989. Seen in all years except 1985 and 1991, a few could be resident. The indications of breeding are N of those noted by Lewis & Pomeroy (1989), and are well above the usual 1500 m upper altitudinal limit they stated, although Stevenson & Fanshawe (2001) had it to 2000 m. The few breeding records in the general region by Brown & Britton (1980) are May–June and November–December. We believe they can breed after rains at any time of the year, our records suggest breeding between the big rains and July–August rains peculiar to this area, and October–November or December, within and after the little rains. Madge & McGowan (2002) considered it a wet-season breeding visitor in the N Afrotropics, as did Borrow & Demey (2001) in West Africa.

GRUIDAE Cranes

Gray Crowned-crane *Balearica regulorum*

Months. January–February, April–October; irregular visitor to S part of study area.

Notes. Regularly seen S of the area at higher elevations near Nyahururu (pers. obs.), breeds to the S and E of the area (Lewis & Pomeroy 1989), resident on Mutara Ranch to the SE (Olson *et al.*, undated MS), and present to the W about lakes Baringo and Bogoria (Hartley 1986). Wanders into the study area, occasionally N to MK (pairs flying W 3 September 1992, and N 21 July 1989). Heard W of PO and S from PO, likely about the dam at the S border of the Ranch, in February, May and July–September, in different years. One pair near Center and Big dams and over MK six times in September–October 1992, once engaged in dancing displays. We have records in seven years; also seen (undated records) by S. Sassoon in the study area, and also by Sassoon, Start, Start and Horne 2 September 1968. Conditions suitable for its breeding are lacking in the study area.

RALLIDAE Rails, coots, moorhens

African Water-rail *Rallus caerulescens*

Months. June–July; casual wet-period wanderer.

Notes. Four records. One at flowing Maji Nyoka stream 4 June 1989; one at flowing water, acacia crossing 6, 11, and 16 June 1990 (same bird likely); one at the same site 2 June 1991; and presumably the same rail both 26 June and 2 July 1995 at the acacia crossing. Usually resident, breeding to the S of our area, but does wander (Lewis & Pomeroy 1989), as to Lake Baringo (Stevenson 1980). There is no breeding indication.

Buff-spotted Flufftail/Pygmy-crake *Sarothrura elegans*

Months. April, September, October; three records, casual wanderer.

Notes. We flushed a flufftail with a rufous head and very spotted body in marshy surrounds of a flowing stream in dense woods at NG 12 September 1988, likely a M of this species. H. Rottcher called us to see a rail at Center, hiding in the curled leaf of a banana tree beside the chicken house 22 April 1995. The M Buff-spotted Flufftail allowed us to approach closely and did not flush, so we had no trouble identifying it. It called that night, and the next, although not seen on the 23rd. B. Heath later mentioned to us that he had seen a small rail in the same row of banana trees sometime in October 1994. The April record suggests movement like that noted by Lewis & Pomeroy (1989). Urban *et al.* (1986) mentioned occurrence among bananas, and use of arboreal song-perches. It is unlikely to breed, except possibly at NG, nor does it seem to be a local wanderer from close by (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996).

African Crake *Crex egregia*

Months. May–June, August–September; uncommon breeding visitor.

Notes. We have essentially two records from about the temporary pond and stream at acacia crossing, probably one bird there 28 May and 18 June 1989, and a family there in 1986. We encountered one adult with two tiny downy young 25 August 1986, and 15 September 1986 we surprised two adults and two much larger but still downy black youngsters crossing the road beside the flowing water leading to the marsh below. No others have been seen, but this record extends the Kenyan breeding range to the NE (see Lewis & Pomeroy 1989, Zimmerman *et al.* 1996). It probably is more frequent than our observations here suggest. We have also failed to see the Black Crake *Amaurornis flavirostris*, unmistakable and very likely

to occur (Lewis & Pomeroy 1989) in the area; it was reported from the study area by C. and R. Francombe (fide S. Sassoon), but with no dates or localities.

Common Moorhen *Gallinula chloropus*

Months. April, June, August, September; casual visitor.

Notes. Likely more frequent than our records suggest, as it is a skulker in sites we largely miss, especially in backwaters of larger dams. One was at Big Dam four days of August 1986, two were at Center Dam 28 June 1988, another was at the Nglesha stream crossing 11 September 1989, and one was at NE Big Dam 13 April 1995. Favorable habitat for its breeding perhaps exists at Nglesha crossing, but likely is insufficiently extensive. The few sightings suggest that it is a casual visitor, not a breeding visitor. The records bracket what would appear to be the main breeding peak of June-August (Brown & Britton 1980).

Lesser Moorhen *Gallinula angulata*

Months. June, one record.

Notes. At the acacia crossing after good big rains, on 4 June 1991 we watched an adult at *c.* 12–15 m for 15 min from our vehicle. It walked and swam, pecked into the mud, and thrust its bill to bite tips of new shoots of marsh grass. Its frontal shield was dusky orange, edged yellow, and the culmen was orange. Its legs were fleshy horn-colored, and its eyes red. It is a rare non-breeding visitor (Lewis & Pomeroy 1989), known from lakes Baringo and Bogoria (Hartley 1986) and streams on Mutara Ranch (Olson *et al.*, undated MS).

Red-knobbed Coot *Fulica cristata*

Months. All; irregular visitor depending upon water conditions.

Notes. Often present in non-breeding flocks during the breeding season (see Brown & Britton 1980), May–August or September; more often a November to February visitor. Present most consistently in 1992 (January, March, May–November), and 1989, 1990, and 1991 were other years when they occurred for long periods in numbers. Heavy flooding in 1993–94 altered the vegetation in dams, especially Big Dam, which was muddy and silted, and numbers have been low ever since. Flocks to 300 before 1990, to 240 in 1993, 150 in 1995, 100 in early 1996, and no more than *c.* 12 since then. Preyed upon by fish-eagles; carcasses often seen, and coots both gather in dense flocks, calling (see Urban *et al.* 1986) when an eagle, harrier

or other aerial predator is seen, and flock tightly together, bodies touching, on spit of land projecting into water for sleeping overnight. When White-backed Ducks were common, often associated with them, feeding in pondweed and other weedy patches. Almost all observations at Big, Center, Dirty, and Nglesha dams. Possibly a pair bred at the last dam June–July 1989, as a pair with red breeding knobs were with two immatures there 27 July 1989, although the immatures could fly and might have flown in from breeding localities to the S and SE (Lewis & Pomeroy 1989).

OTIDIDAE Bustards

Denham's/Jackson's Bustard *Neotis denhami*

Months. April, one record.

Notes. A M in short grass 500 m N of the Main Gate 17 April 1994, allowing close approach, is the only one we have seen, although S. Sassoon's undated report of a Kori Bustard *Otis kori* in the study area may represent Denham's Bustard. One was reported to us 17 July 1994 on Mugie Ranch by B. Heath, this being just NE of the study area (it is known to the E, Lewis & Pomeroy 1989). Presumably these represent wanderers from the E, of the race *jacksoni*. The Kori Bustard has not been seen by us, or by staff (D. Chepus) who know it well, although it is resident at Mutara Ranch to the SE (Olson *et al.*, undated MS).

Buff-crested Bustard *Eupodotis ruficrista*

Months. All but March, presumably resident.

Notes. Seen and heard in all years except 1984, 1990, 1997, and 1998; calls heard April, September, November–February. Local in bushland and bushed woodland-wooded grassland habitats from NW through the center of the study area to the S and SE borders, where occurring at 2000 m (well above the 1400 m given by Lewis & Pomeroy 1989, and 1250 m noted by Zimmerman *et al.* 1996 as the usual altitudinal limit, and above the 1800 m stated by Stevenson & Fanshawe 2001). The only indication of breeding other than calling and “rocket-flight” displays (see Urban *et al.* 1986) was the presence of a F with two immatures about half her size near Dirty Dam (at *c.* 1930 m) 9 July 1993. This suggests breeding in that area May–June. One called E of EG while we were watching a White-bellied Bustard; it overlaps with both that species and the Black-bellied Bustard. It seemed to be a Buff-crested Bustard in the talons of an African Hawk-eagle N of MB on 9 May 1993.

White-bellied Bustard *Eupodotis senegalensis*

Months. January, April–November; local resident.

Notes. The least common of the three regularly occurring bustards, in bushland edges, bushed grassland and wooded grassland, mainly central and E study area, but W to Main Gate and PK. Grazed leleshwa-*Euclaea*-olive and *Carissa-Euclaea*-olive bushland seem favored but near edge of area to E and S likely uses cultivated fields. Calling has been heard in all months of occurrence. Display as in Urban *et al.* (1986), but also include “pleep” notes; seen May and July, on 15 July 1992 along the E border three MM were calling and displaying. These displays and sighting of F with two immatures of less than half adult size above GMF tank hill 20 July 1993 are indications of breeding within and following the big rains. It breeds to the NE and E of the study area (Lewis & Pomeroy 1989), and is generally considered to be resident, although movements are known elsewhere (Chad; Borrow & Demey 2001).

Black-bellied Bustard *Eupodotis melanogaster*

Months. January–September, December; almost surely resident.

Ecology. The commonest bustard, also less shy than the Buff-crested, found in open woodland, wooded grassland, bushed grassland, wet areas near dams, and roadside ditches. We carefully checked those seen for Hartlaub's Bustards *E. hartlaubii*, known to the E, but all seen were Black-bellied Bustards.

Movements. There are no indications that it leaves the area. Often seen in flight, sometimes displaying, otherwise moves to feeding sites, as across a lugga; seen to return occasionally, and also observed making the same flight on consecutive days.

Behavior. Advertising display of M, watched closely, a two-part display, first with neck and bill pointed to the sky, neck partly stretched, with growly whistle, and, after a pause, the head is moved rearward onto the back, then utters the bubbling “glop” note (see Urban *et al.* 1986). Also, display flight of M over F or territory, ending with a stilted flight, wings held in a V as throat, head and breast feathers are spread and it lands, still in display. Two MM may fly toward each other and swing back (over territorial border), sometimes in this V display. We have seen flight displays April–September and December, and advertising display May–September.

Breeding. Displays of pairs May–July suggest breeding then. Evidence of destroyed nests seen in July at UL and December NE of GMF. The July nest of grasses

5 cm deep, 13 cm wide, under a *Carissa edulis* bush, well hidden by grasses; no egg shells were noted, and a large patch of feathers beside it were of this species. The December nest was destroyed but large eggshells were of this species (shells dark olive-brown with irregular markings in dark gray to chestnut brown, in tiny flecks to marks 1 cm long, the markings heavier at one end); pair of Black-bellied Bustards was known to be in that area. Breeding further is indicated by a F with a partly grown immature E of EG 8 January 1987. Overall, breeding in June–July and November–December, following the big rains into the July–August rains, and late in October–November little rains, not closely matching those given by Urban *et al.* (1986) and del Hoyo *et al.* (1996), but they likely had no triple-rainy season localities in their samples, as Brown & Britton (1980) had none. Probably six to eight pairs occupy the study area.

RECURVIROSTRIDAE Stilts, avocets

Common/Black-winged Stilt *Himantopus himantopus*
Months. All, common visitor, irregular, most in August–September and December–January.

Notes. Can occur at any time, usually one to four, sometimes to six or 10, uncommonly to 20 (in December–February). More December–January records than in August–September, latter may reflect post-breeding wandering (Brown & Britton 1980, May–July breeding noted). Most occur at the large dams; one spent two days at Ol ari Nyiro Spring. One group of seven flushed at Big Dam alighted among geese out in the water, and swam with them. Immatures mainly seen August–December, some subadults occur all year. Most stilts stay a few days, or a week at most, so are passing through. Breeds SW of the area (Lewis & Pomeroy 1989), and occurs at dams elsewhere on the Laikipia Plateau, as at Mutara Ranch (Olson *et al.*, undated MS).

Pied/Eurasian Avocet *Recurvirostra avosetta*

Months. August, December–February; casual visitor.

Notes. Seven records at Center and Big dams, mainly adults, singly to 12 birds. One immature 3 December 1988 flew and then swam with three Yellow-billed Ducks at Center Dam, and the 12 adult avocets at Big Dam 22 August 1997, when flushed, came down among Egyptian Geese far out in the water, and swam among them. It is a visitor from the S and W (Lewis & Pomeroy 1989, mainly an October–May visitor to the W at Lake Baringo, Stevenson 1980). The six of seven occurrences December–February suggest pos-

sible Palearctic visitors, but Zimmermann *et al.* (1996) denied that such occur, and no proof exists that northern avocets reach Kenya.

BURHINIDAE Thick-knees, stone-curlews

Spotted Thick-knee *Burhinus capensis*

Months. January, April, June–August, December; scarce breeding visitor, possibly resident.

Notes. Occurs in open bushland and degraded woodland edges, as well as bare areas such as borders of dams, and airstrips. Most records are June–August, but that may be due to vocal activity at that time. Not seen prior to 1988, when radio-tracking of honeyguides kept us out into the night. Often in pairs, and in trios or fours involving young in June and August; the young were essentially adult-sized immatures at Saddle Boma 19 June 1990 and near Big Dam 6 June 1991, and two half-sized immatures with two adults at acacia crossing 10 August 1991. In the last case both adults gave “broken-wing” displays while the young crouched. Thus, it breeds May–August, after the big rains and into the July–August rains, a period in between those given for this region (but not for triple-rainy-season sites) by Brown & Britton (1980). A May–June nest at Nanyuki produced at least one young (an addled egg was alone in nest 5 June), and, presumably the same pair nested again 2.5 m from that site in November of the same year (2001). Calls heard include: “pip-pip-pip” from the adults giving the distraction displays, “chuk, chuk,” notes, and the usual advertizing calls (uttered by both adults), “tee-tee-teeeteeteeteeteek-tee-ti” frequently answered from afar. Well known to occur about the study area (Lewis & Pomeroy 1989). The Water Thick-knee *B. vermiculatus* could occur, but we have not seen or heard it.

GLAREOLIDAE Coursors, pratincoles

Temminck’s Courser *Cursorius temminckii*

Months. April, July; E of area.

Notes. Seen by us in the 1960s, (JH), and March, 1976 (LS), more recently 4 July 1994; noted near the E border of the study area by S. Sassoon in April 1983, and reported from there by C. Francombe sporadically but more or less regularly. All observations and reports are from short-grass situations in the central E area, especially in mown and grazed airstrips, and along the E boundary. We miss this species because of its open habitat, but have noted it several times on trips to the E of the area under study. Open, recently

burned grasslands are favored by this courser (Short *et al.* 1990), and it breeds farther E on Laikipia Plateau (Lewis & Pomeroy 1989), and possibly within our study area in wet years.

Three-banded/Heuglin’s Courser *Cursorius cinctus*

Months. All; all areas, avoiding dense woods, riverine areas, and open grassland.

Ecology. Favors open bushland and woodland, especially degraded acacia woodland, and roads, where often killed by cars during the night. Attracted to old bomas. Common at 1800–1900 m, also seen to 2000 m.

Movements. Likely moves locally, not seen in drought year 1984, but generally resident (see Lewis & Pomeroy 1989). Moves out of some sites after breeding.

Behavior, Voice. Persistent nocturnal calling, especially after dark, before dawn and on moonlight nights, presence of numbers of coursers, and their occurrence in interactive groups mark the breeding period in the study area. The common vocalization (“song”) is a far-carrying series of “t’ink, t’ink” (or “tee-yink, tying”) heard at a distance, or, at close range a “tyewi, tyewi” (or “tyuit, tyuit”), possibly equivalent to the piping “wik” or “chuiik” or “pieu” notes ascribed to this species (from southern Africa, where there is a disjunct race) by Maclean (1993) and Urban *et al.* (1986). We have observed the birds calling during interactions, when they utter the “t-ink-” series that gives way to a fast “klee-keee-kleep-klik-kik-keep” (crescendo, two may call), and also “kew-kew” calls, and giving rattling notes in alarm situations when they are forced to fly. During interactions, individuals may put the head high or far back, perform push-ups with the legs, bob the head, and swiftly flick the tail open and closed (displays not described for Three-banded, but some resemble displays Urban *et al.* 1986 gave for Two-banded, *C. africanus*). Others have slowly bobbed the head backward, then thrown it rapidly forward, with or without tail-spreading.

Breeding. Over the years songs, including tinkling and crescendos, were heard in all months, but mostly April–August and December–January, during and after rains. At GMF in January 1996 as many as six groups called. At gatherings of three or more the above displays were seen. Up to one pair, trio or group per km of road have been counted in breeding periods. An adult with downy young was seen W of Northern Plain Dam 20 September 1986, a pair with at least one downy young seen 10 January 1996, and an immature was near Northern Plain Dam with an adult

18 May 1996. That immature lacked the chestnut breast band and had dull crown streaks. Cluster-calling and singing with interactions indicated breeding April–September in all years except 1985, 1988 and 1991, and November–January of all years except 1984–85, 1986–87, and 1990–91. Brown & Britton (1980) gave seven breeding records in April and June–November, and Urban *et al.* (1986) noted April–July and September–December Kenyan breeding records. Because the courser scrapes a nest in the surface of the soil, and nearly buries its eggs (Tarboton 2001) on the usually flat terrain of our area, heavy, repeated rains are unsatisfactory for nesting. Conditions vary so that breeding may occur whenever they become suitable, mainly after strong rains.

Specimen. Only one road-killed specimen was sufficiently fresh to allow close examination; it was a F with granular, 2 mm-ovary, wing 162 mm and tail 86 mm, and was picked up 10 July 1990.

CHARADRIIDAE Lapwings, plovers

Blacksmith Lapwing/Plover *Vanellus armatus*

Months. Resident, usually at all major dams.

Ecology. Most commonly about dams in pairs, but sporadically singly or in pairs at pasture areas, as near Center, where markedly less aggressive even associating with Crowned Lapwings there. In periods of low water, as December 1991 and January 1992, they may leave all but the largest dams. Feeds usually at water's edge. From two to eight pairs at Big Dam. May flock when aerial predator, as Peregrine overflies. As many as 20 seen within 200 m about Big Dam (30 January 1995).

Behavior. Aggressive, often stands ground against a human, pair may attack seven to eight elephants! Often keeps Three-banded Plover from shoreline where it feeds. One flew at and briefly chased a fish-eagle carrying prey. Has a slow flight with wing beats in time with its nasal "tink" calls. Pairs frequently are in conflict when breeding commences.

Breeding. Nests usually on a tiny spit of land, or an island in a dam. Breeding noted in April–September, fitting well with dates of Brown & Britton (1980). An island in Nglesha Dam had a nest visible 6 April 1995, and two downy young gaining black and white on the head 13 April; the M chased two Red-billed Teal from the island, but an Egyptian Goose with young drove the M to the end of the island, where, with the F, it crouched over the young. Likely the same two young were essentially independent by 28

May. A nest at Center Dam 7 May 1995, seen on 9 May, had two downy young near it on 1 June. At a small dam near Big Dam a F sat on a nest 3 July 1994, pushing at bits of reeds and grass under her. Three downy young were with a pair at Big Dam 7 August 1989. Two nearly grown immatures accompanied a pair at Lugwagippe Dam 12 September 1989. We rarely had time to search for nests about dams, so doubtless missed many of them.

Senegal/Lesser Black-winged Lapwing/Plover *Vanellus lugubris*

Months. February, April, May, July, November, December, since 1988; usually in degraded areas.

Notes. Ten of 15 records are in April–May, and 13 of 15 are in 1993–1995. Most were seen in pairs, or numbers up to six, with some flying over at night. Particular sites were old bomas about the Lugga Maji Nyoka, the Northern Plains area (where the following lapwing also has been seen), and in a degraded area near SI. The only possible breeding indication was of four subadults with two adults 20 April 1995 in the Northern Plain degraded acacia woodland; these likely came from elsewhere. This lapwing usually occurs below the 1800-m elevation of much of the study area, and below the following lapwing, but both have occurred in the study area in recent years (Lewis & Pomeroy 1989, Short *et al.* 1990). It may be extending its range due to habitat degradation at higher elevations. Calls "tu-wit," "tu-wee-eee," and "pee-pee-pee," occasionally in series, contra Stevenson & Fanshawe (2001).

Black-winged Lapwing/Plover *Vanellus melanopterus*
Months. January–February, April–September, November–December, mainly pastures, old bomas, degraded bushland-woodland.

Ecology. Occurs in open, mostly degraded habitats, not at water, all over the area. The nearly 40 records are concentrated (27) in April–July. This often shy and quiet lapwing has been found regularly in the area, at least since the 1960s and it is the third most common, after Crowned and Blacksmith lapwings. It shares its habitat with the ubiquitous Crowned Lapwing.
Movements. Movements occur particularly in April–July, and sometimes in December–January (flocks of 12–50 seen); *c.* 50 flew about Nglesha much of 29 January 1992. It is apparently not resident.

Behavior. Sometimes overflies silently, flying lapwings seem to perceive when they have been sighted, then call. On 30 May 1990 about Kuti, a dozen with four accompanying Crowned Lapwings, chased a Brown

Snake-eagle. Holds wings out in display at times when calling but often calls at intruders without visual displays.

Voice. Calls have been characterized by many, and are perhaps more variable than in the previous lapwing, as Urban *et al.* (1986) noted. Calls in flight were “ki-ki- kip” to “key-key-kay” in series. On the ground, taking off, and landing gives “chi-chi-chreek,” “chee-reeut” and “pwee-ert,” and Senegal Lapwing-like “peet-weet-weet” calls (see Hayman *et al.* 1986, Zimmerman *et al.* 1996).

Breeding. Our only records are for the Northern Plain Dam region, where we had a pair with two downy young, unable to fly, 2 July 1990, and a pair with an immature on 23 June 1991. In well-grazed acacia grassland the downy young moved away from us while the adults, joined by Crowned Lapwings, called at us, and the immature flew ahead of us with its parents. The immature was adult-sized, buffier on the head and throat than adults, with mixed buff and brown upperparts; it lacked the red orbital ring of adults. These records suggest breeding later than the March peak noted by Brown & Britton (1980), and more like the period given for areas W of ours.

Crowned Lapwing/Plover *Vanellus coronatus*

Months. Resident; all over study area.

Ecology. Favors bare ground or short grass, roads, degraded, open woodland, open bushland, old bomas, dams lacking Blacksmith Lapwings (that are dominant), and bare areas back from water of larger dams having Blacksmiths present. Associates with game, guineafowl, and with cattle. Mobs jackals *Canis mesomelas* and aerial predators, usually in groups of 10 or more, but a jackal following lions was attacked by a single lapwing and chased back 50 m in the direction in which the jackal had come. May not even yield to a vehicle, facing it, head lowered, wings stretched, calling. Rests at times with Blacksmith Lapwings in pastures, away from water. Where breeding in appropriate habitat there may be a pair every 250–500 m along roads.

Movements. Moves locally, sometimes in flocks to 40, before and after breeding. Numbers very low, or even absent in drought years, as 1984. Non-breeders move at night.

Behavior, Voice. Gives distraction displays about nests and young. When breeding, displays aerially about nesting area. Vocally well known, calls at night, its loud calls a major feature of the area. Fast calls resemble the calls of Nubian Woodpecker.

Breeding. Over 30 records of nests, eggs, and downy young show breeding, except in drought years, April–August and November–January. Contrary to Urban *et al.* (1986), del Hoyo *et al.* (1996) and others, does not nest socially, but in pairs loosely on territory, as Tarboton (2001: 81–82) noted. Nests are in the open, often on a small rise, sometimes amid dry buffalo dung; eggs are buffy with variable markings in several tones of brown. Newly hatched young are quickly led from the vicinity of the nest. Usually two young are raised, sometimes but one, rarely three (see van Someren 1956). Immatures have partial head markings, buff scaling or mottling dorsally, and yellowish to pink legs, and thus are very distinctive. The parents are diligent in protecting them and attacking potential predators. In displays adults show pink about the mouth, ahead of a black gape. Brown & Britton (1980) indicated breeding in all months for our region, with a peak April–June, but likely their records did not include the peculiar triple-rains regime of the Laikipia sub-region, see Brown & Britton 1980: 8).

Ringed Plover *Charadrius hiaticula*

Months. April, August, October–March; at large, open-shore dams.

Notes. Most records are for November–January, usually in small numbers, scattered about the shoreline, particularly at Big Dam. Probably undercounted; we seldom had time to identify all small shorebirds. Also seen at Center Dam, Lugwagippe Dam, and Titus Dam. Groups, when in numbers, forage more loosely than do Little Ringed Plovers. We have seen as many as 50–60 about Big Dam.

Little Ringed Plover *Charadrius dubius*

Months. April, July, November–February; dams, mainly Big Dam.

Notes. Less common than previous plover; when in groups feed closer to one another, more often flush in flocks. The two single plovers of 14 and 20 July 1994 were seen closely, and the yellow orbit, dull yellow legs and lack of a wing bar were noted; these were in breeding plumage and likely were the same individuals, though seen at different dams. Almost all records are from Big Dam, but also found at Lugwagippe, Nglesha, and small Nyanya dams.

Kitlitz's Plover/Sandplover *Charadrius pecuarius*

Months. All; central area dams, possibly resident.

Ecology. Although a shoreline forager, frequents salt-stained short grass areas at 100 m back from water, and airstrips, and breeds at such places. Social, in small numbers to 40, 60, and once, 100.

Movements. Common at its sites in more or less normal years, few or none occur in drought years, and numbers are low in very wet years. Irregular movements are known (Lewis & Pomeroy 1989).

Breeding. About nine records in April–August, breeding SE of Big Dam in an overflow area with short grass, in low grass of an airstrip E of Center, and possibly Center Dam, where one immature was seen with two adults 23 September 1998 (we judge that the young bird likely could not fly the distance of 4 km from Big to Center dams). Downy young have been found as late as 4 July. Two young molting from downy to juvenal plumage 26 April 1996 probably hatched in March. A freshly broken egg with a downy young and two adults nearby 1 June 1992 was c. 50 m from the shoreline of Big Dam, in short grass. One downy young fled on foot after its flying parents to the shoreline and out into the water, where it bobbed about. Brown & Britton (1980) had breeding in all months with a peak in April–September, nearly as in our area.

Three-banded Plover *Charadrius tricollaris*

Months. Resident about dams.

Ecology. Favors smaller dams, springs and temporary pools away from aggressive Blacksmith Lapwing, but at bigger dams when not breeding, and can breed inland from water at large dams. It also is aggressive, chasing sandpipers and other plovers. Occasionally away from water, feeding on insects about cattle and dung. Flycatches upwards from ground after rains. Occurs singly and in pairs, rarely groups to six. One flew alongside our vehicle for 12 s at 33 kph. Has raised a brood near Ol ari Nyiro Spring.

Breeding. Eggs, downy young April–July, immatures May–September. Copulations observed April–May, F fluffing breast, crouching, calling “kip,” fanning tail as M mounted, after three-plover interactions; also, in another case, M strutted (Urban *et al.* 1986) behind F for 2 m, she stooped, soliciting as just described, and M mounted. Blue to blue-gray eggs, usually two, once one with various darker gray and pink marks (differing from those described by Urban *et al.* 1986 and Maclean 1993; see Plate 59 of Tarboton 2001). Nest away from water, to 80 m or so, often on bare ground among rocks; one was of bits of grass on murrum soil beside a basaltic rock with no vegetation within 5 m. Immature may show buff edges below as well as above, has incomplete second brown breast band, forecrown is gray, bill dusky flesh, legs very pale pink and orbit dull pink (not as in illustrations of Hayman *et al.* 1986 and Zimmerman *et al.*

1996; see Urban *et al.* 1986). One loose flock of five immatures 21 July at Big Dam suggests that dispersing young Three-banded Plovers may gather in groups.

Caspian Plover *Charadrius asiaticus*

Months. Only 25 November–15 December 1983.

Notes. At Center airstrip and pasture c. 20 foraged on patchily bare, dry ground with low grass for several weeks. We did not see it otherwise. It is a common boreal winter visitor regularly occurring in this region (Stevenson 1980, Hartley 1986, Lewis & Pomeroy 1989). Also reported in the study area by S. Sassoon (undated records).

SCOLOPACIDAE Godwits, “shanks,” curlews, sandpipers, stints, snipes, other shorebirds

Black-tailed Godwit *Limosa limosa*

Months. September (one), December (three), January (four), Big and Center dams; casual visitor.

Notes. The commoner of the two godwits occurring inland (Lewis & Pomeroy 1989, Short *et al.* 1990), single birds were noted in four years. S. Sassoon (*in litt.*) reported 12 at Center Dam and seven at Big Dam during January 1982, and c. 30 at Big Dam in January 1983. We observed five together and two alone at Big Dam 19 December 1993, six there again 23 December that year, and two, likely of the same group there 3 January 1994. The early record was of a single bird at Big Dam 20 September 1986. Regular at Lake Baringo and noted at Mutara Ranch on Laikipia Plateau (Hartley 1986, Olson *et al.*, undated MS, Lewis & Pomeroy 1989).

Bar-tailed Godwit *Limosa lapponica*

Months. December, February, three records; casual migrant and visitor.

Notes. This less common godwit was observed at Big Dam 8 December 1986, and 19 February 1991, both single birds. One bird loosely associated with the Black-tailed Godwit group noted above was seen (and compared with that godwit on the shore and in flight) on both 19 and 23 December 1993. An uncommon to rare Palearctic visitor (Lewis and Pomeroy 1989).

Spotted Redshank *Tringa erythropus*

Months. February, December, five records; casual, irregular visitor.

Notes. Seen at Lugwagippe and Big dams on five occasions in 1986, 1988, and 1989. The greatest number was 10 foraging in shallow water at Big Dam 8 December 1986. We saw one at Lugwagippe Dam 20 December 1986, and two there 30 December 1986

– the two were swimming in water *c.* 25 cm deep, probing with head and bill beneath the water, for *c.* five min. The other two records are of one at Lugwagippe Dam 2 February 1988, and another there feeding among stilts 30 December 1989. Uncommon, this Palearctic wader is found regularly in Kenya December–March, including at Lake Baringo (Lewis & Pomeroy 1989).

Redshank/Common Redshank *Tringa totanus*

Months. December–February, three records; casual visitor.

Notes. Two walked about, using their feet to disturb the bottom, then feeding, at Big Dam 20 December 1986. At Lugwagippe Dam 6 January 1988, three in a row fed, heads turning side to side, with deep probing movements. One probed sporadically walking in wide circles at Lugwagippe Dam 3 February 1988. Less common than Spotted Redshank, but regular boreal winter visitor in Kenya (Lewis & Pomeroy 1989).

Greenshank/Common Greenshank *Tringa nebularia*

Months. All, at all waters; Palearctic visitor, but 15 records May, nine for June, over 20 for July.

Notes. The June records of this common sandpiper are all 1990–1996. Usually solitary, may fly together but separate on landing. Up to 14 found around Big Dam shoreline on one day. They are attracted to dams, temporary pools, and flowing water, even to roadside puddles. Several usually are along the lower Mukutan River. Aggressive, one flew at an African Pied Wag-tail, that had just chased a Common Sandpiper, and chased it away. Two or three can feed in 20–30 m of shoreline at times, but not along streams, where they are territorial. They move readily from one site to another, and are often heard flying over, calling, at night. Feeds on frogs (one with red legs), and the abundant crayfish *Gammarus* sp. released in dams years ago (from Louisiana, USA). It hunts the crayfish by wading with a shuffle, then grasps it with its bill – one captured and ate three in *c.* 220 s. At times it swims. Its numbers are not constant, and vary year-to-year and within a year, although there may be some that return yearly to particular sites.

Marsh Sandpiper *Tringa stagnatilis*

Months. All but June, all waters, less often at streams than Greenshank.

Notes. Sometimes as numerous as Greenshank, less obtrusive and likely missed more often; less widespread, only occasionally at springs and temporary pools. Like Greenshank usually solitary, occasionally

three within 20 m, greatest number at a site is 12 at Big Dam, scattered about the shoreline. There are but three records for May, to 29 May (1989), the five July records are from 9 July onward (some “oversummer,” Lewis & Pomeroy 1989). Feeds rather like Greenshank, seen eating small frogs and crayfishes.

Green Sandpiper *Tringa ochropus*

Months. All but May–June, at streams.

Ecology. Found along Mukutan River, streams flowing from springs, and temporarily flowing streams such as at PK, Nglesha, and acacia crossing. Rarely occurs at dams. At the Mukutan River outnumbers Common Sandpipers and Greenshanks, territorial, one bird defending 150–300 m of river. We have four records for April and two for July (18, 28 July), but common mainly late August–March. The July records are unusual (Lewis & Pomeroy 1989, Stevenson & Fanshawe 2001), but reaches South Africa in August (Harrison *et al.* 1997), and a few could occur all year, as in West Africa (Borrow & Demey 2001). Occurs near dams only where water flows around or through the dam, e.g., below the wall of the dam, along flowing streams.

Voice. Calls frequently, “p’weet,” “pee-weet,” “twee-twee-twit” and sometimes continuous “cher-weet-weet” calls during chases. “Wheep” and “too-ree” are other notes heard from chasing sandpipers. Aggressive calls are more varied than indicated by Cramp *et al.* (1983) and Colston & Burton (1988).

Specimen data. Five Green Sandpipers netted September–February weighed 71–79.5 g, with wing 132–136 mm. One netted 11 September 1987 at MK weighed 79.5 g, was retrapped in same place 19 October 1987 chasing a second Green Sandpiper; the retrapped bird weighed 77 g, that chased was 72 g. None of those netted was in molt.

Wood Sandpiper *Tringa glareola*

Months. All but June; all over, mostly at standing water.

Notes. Common Palearctic wader found in small numbers, mainly at larger dams. There are three records from May (1, 2, 19 May), and two from July (16, 31 July). Present in numbers late August–April. First seen during 1987 on 31 July, numbers were all over by 6 August 1987, making that year exceptional. Calling birds frequently heard overhead November–March, in movements from one body of water to another. Observed near a Green Sandpiper only below Nglesha Dam where water was flowing through low marshy growth. It was observed at all large and many small dams.

Common Sandpiper *Actitis hypoleucos*

Months. All; all bodies of water, even puddles on road.

Notes. Solitary, sometimes two close together, but often aggressive, keeping others at 50 m or more (two spent 7 min chasing before one was driven off a dam wall). Common July–April, with seven records for May (between 1–23 May), and two for June; the last were 14 June 1992 at Big Dam, and 23 June 1990 at Olari Nyiro Spring. It is known to “oversummer” (Lewis & Pomeroy 1989) regularly. One Common Sandpiper from 16–22 July 1991 was a proficient stalker of butterflies at the acacia crossing (Fig. 3) where water flowed slowly over the roadway. This sandpiper methodically, slowly placed one foot, then the other approaching a cluster of hundreds of white and yellow butterflies on the wet verge, with bill at a 45° angle; softly “tip-toeing”, it preyed like a heron on butterfly after butterfly, on one day taking 10 of 11 for which it tried. We noted this hunting procedure on six days, for brief periods. After each successful stalk it bobbed up-down three or four times before resuming its stalking.

Ruddy Turnstone *Arenaria interpres*

Notes. One seen for 20 min 26 December 1982 at Big Dam, probe-pecking under small stones. An uncommon visitor from the Palearctic, known from lakes Baringo and Bogoria (Hartley 1986).

Common and African Snipes *Gallinago gallinago*, *G. nigripennis*

Notes. The near-absence of records May–September suggests that most snipes observed were migrating or “wintering” Common Snipes. We rarely could spend time attempting to identify snipes in the wet, open places in which they occur. One snipe at S Big Dam 27 August 1993 had the mainly white tail of the African Snipe, as did one seen probing beside the road at the edge of Big Dam 18 April and 27 April 1996. At least two of three seen at Lugwagippe Dam 13 November 1992, a pair together closely at Titus Dam 23 November 1993, and two probing with very long bills at Nglesha Dam 7 January 1988 were African Snipes. A snipe sun-bathing with spread wings and tail after a rain at Lugwagippe Dam 3 January 1988 was a mostly orange-tailed Common Snipe. The other 15 or so sightings perhaps could represent either species, as the tail was not seen clearly and bill length is not diagnostic; most likely were Common Snipes. We have no evidence of breeding by the African Snipe, and the near lack of May–August wet season records argues

that it does not breed in the area (breeding is mainly in wet April–July, Brown & Britton 1980). There is little habitat for breeding snipes in the area, which is at the lower extreme of altitude for the African Snipe. Known at Pesi Swamp, Mutara Ranch, on the Laikipia Plateau (Olson *et al.*, undated MS).

Sanderling *Calidris alba*

Months. January, August; two records, casual.

Notes. Two records of two birds each on open “beach” of Center Dam 11 August 1989, these still in buff-rusty breeding plumage, and two in typical, pale non-breeding plumage at Lugwagippe Dam 8 January 1992. These were near, respectively, a Common Sandpiper and a Ruff; all were flushed to allow viewing of the white wing bar of the Sanderling. It is a sparse inland migrant August–April (Lewis & Pomeroy 1989), known also from lakes Baringo and Bogoria (Hartley 1986).

Little Stint *Calidris minutus*

Months. 31 July–27 April; mainly muddy shores of dams.

Notes. In wet years may be seen at extensive temporary puddles, as in December 1994. Common, usually in small groups, sometimes in flocks to 50. Most have been seen at Big Dam, and to a lesser extent Center, Nglesha, and Lugwagippe dams. Much more numerous than the following stint. There are eight April records and one from July; a mainly August–May Palearctic visitor (Lewis & Pomeroy 1989).

Temminck's Stint *Calidris temminckii*

Months. Casual August–February.

Notes. Nearly a dozen records of one or two birds each, at Center, Lugwagippe and Big dams, and also in a marshy overflow of acacia crossing (11 August 1987). These are from August–February, the earliest being 3 August 1986. An August–May Palearctic visitor in low numbers (Lewis & Pomeroy 1989; adults leave breeding sites as early as the first week in July, Cramp *et al.* 1983).

Curlew Sandpiper *Calidris ferruginea*

Months. August–May, at dams.

Notes. Over 30 records and reports, with three records for August (from 8 August), and one 5 May 1996. Most occurred at Big, Center and Nglesha dams, with a few at other dams such as Lugwagippe. Mainly in small groups among the other stints, which they dominate and tend to chase. Occasionally in flocks up to 20. Common Palearctic visitor.

Dunlin *Calidris alpina*

Months. One December record; vagrant.

Notes. A single adult seen by itself 14 December 1997 and an adult with Curlew Sandpipers 19 December 1997, both at Big Dam. The Dunlin's dark rump, lack of white superciliary, and its smaller size compared with the Curlew Sandpiper, were evident. As of c. 2000 (Stevenson & Fanshawe 2001) there were five other Kenyan records, one from Lake Baringo; most spend boreal winters N of the equator (Urban *et al.* 1986).

Ruff *Philomachus pugnax*

Months. August–March; Palearctic visitor in small numbers about grassy shores of dams.

Notes. Quite frequent visitor at muddy, sometimes grassy-edged Center and Lugwagippe dams, rather than at Big Dam. Usually singly, occasionally two or three are seen. Its quiet demeanor make it easily missed in vegetation bordering muddy shorelines.

LARIDAE Gulls

Gray-headed Gull *Larus cirrocephalus*

Months. June, vagrant; also April (reported).

Notes. The commonest gull inland in Kenya (Lewis & Pomeroy 1989), reported early April 1983 by S. Sassoon, and noted by long-time manager C. Francombe (*in litt.*) as observed rarely, mostly in April–May. We have seen but one, an adult in breeding plumage beside darters on an islet in Big Dam 14 June 1992.

Black-headed Gull *Larus ridibundus*

Months. December–February occasional visitor to dams.

Notes. Has become a common boreal winter visitor to Kenya in the past three decades (Lewis & Pomeroy 1989, Short *et al.* 1990, Zimmerman *et al.* 1996). Our five records include: a first-winter-plumaged subadult 27 December 1983; one like it 20 December 1986; a non-breeding adult and subadult 13 January 1992; possibly the same subadult as the last 28 January 1992; a weakly spot-marked adult 29 December 1995–3 February 1996 (at Big Dam); and a strongly spot-marked adult 13 January–2 February 1996 (at Dirty Dam; the last two gulls seen at the separate dams, 13 January 1996). These were at Big, Center, Lugwagippe and Dirty dams.

Lesser Black-backed Gull *Larus fuscus*

Notes. One full adult, not yet in winter plumage, was observed and photographed on Dirty Dam 12 September 1986. This is our only record of this gull which

that also has increased in numbers, although not usual before October (Lewis & Pomeroy 1989). The gull was obviously of the nominate race *L. f. fuscus*, which commonly visits inland Kenyan lakes.

STERNIDAE Terns

Gull-billed Tern *Sterna nilotica*

Months. C. nine records, September, December–February; dams, shorelines, grassy areas.

Notes. A non-breeding adult was observed at Big Dam, foraging back from the shoreline over grass on 22 September of both 1996 and 1997. During December we recorded this tern in non-breeding plumage: 13 December 1995, one still showing brown on the back (subadult), with a group of White-winged Black Terns on an island of Big Dam; one adult at Center Dam 20 December 1988; and two adults at that dam 27 December 1988. An adult in non-breeding plumage fed at the edges of Dirty Dam 16 January 1989. On 26 January 1988 one adult was ashore with three White-winged Black Terns at Center Dam; this may have been the same adult at Lugwagippe Dam 2 February 1988. At Center Dam 31 January 1995, four Gull-billed Terns fed over the water, calling “tweet-toot,” the second note dropping, probably a variant advertising call (Cramp *et al.* 1985). This is a common migrant tern from Eurasia (Lewis & Pomeroy 1989, Short *et al.* 1990).

Whiskered Tern *Chlidonia hybrida*

Months. Over 20 records, all months except March, August, November; over or beside dams.

Notes. This tern breeds at lakes in N Tanzania to central Kenya in May–July, and also December–January, so can be seen in diverse plumages all year (Brown & Britton 1980, Urban *et al.* 1986). Thus one of three on 3 February 1992 was in juvenal plumage, all seven terns seen April–June were adults in breeding plumage, and one adult 3 July 1995 was in breeding plumage, but two on 18 July 1991 and one 22 July 1991 were in non-breeding plumage. Most of the September–January Whiskered Terns were in non-breeding plumage, but two adults 30 December 1989 were in breeding plumage; one of the latter fed the other, stretching out its neck while the second crouched and took a small fish (E.K. Dunn in Cramp *et al.* 1985 described this, it occurs pre-laying as well as during laying and thus the pair may have been en route to a Rift Valley breeding locality). Two of four non-breeding-plumaged birds 29 December 1995 were partly

brown on the back (subadults). It more often feeds over the grassy or weedy inshore areas than does the White-winged Black Tern. Usually occurs in groups, though half our records are of single terns; the largest number seen was 10. It was observed mainly at Big Dam, but also noted occasionally at Lugwagippe and Center dams, and two in breeding plumage flew NE low over one of our waterless hill sites 26 June 1991.

White-winged Black/White-winged Tern *Chlidonias leucopterus*

Months. July–April (none in March, November); over or beside dams.

Notes. Over 25 records of one–18 of these terns nearly all at Big, Lugwagippe and Center dams, and mainly in non-breeding plumage. One molting into breeding plumage was at Big Dam 27 April 1998. On 3 July 1996 an almost fully breeding-plumaged adult (some white on throat and face) was at Big Dam, whereas two seen 27 and 30 July 1986 at Center Dam were more nearly in non-breeding plumage (but note that it regularly oversummers, possibly in either plumage, although most probably are oversummering, non-adult terns; Cramp *et al.* 1985, Beaman & Madge 1998, Borrow & Demey 2001). At Big Dam 30 January 1992 one foraged over open water while a Whiskered Tern foraged over the weedy shore; the White-winged Black Tern also flew very near a perched fish-eagle. Flies into the wind, dipping down to the surface of the water again and again. Calls (a harsh “krrr”) were heard several times, including by the bird “mobbing” the fish-eagle. Present all year at nearby Lake Baringo (Stevenson 1980).

PTEROCLIDAE Sandgrouse

Lichtenstein's Sandgrouse *Pterocles lichtensteinii*

Notes. Seen by Horne at several dams in February 1967, and at other times in the 1960s, when she resided in the study area. Observed by S. Sassoon (undated records), and by us 11 December 1983 at a dam above Kutu (Nandi Dam, 1920 m). Not seen in recent years, possibly replaced by the following species, although it could remain in rocky areas not visited by us in the N and NE of the study area. The common sandgrouse at Lake Baringo (Stevenson 1980), also at Bogoria (Hartley 1986). Usually at lower elevation than in the study area (e.g., to 1800 m by Madge & McGowan 2002), but mapped for the Laikipia Plateau by Lewis & Pomeroy (1989), and is at (lower) Pinguone to the NE (Schulz & Powys 1998).

Four-banded Sandgrouse *Pterocles quadricinctus*

Months. All; may be partly migratory.
Ecology. First reported for the area by us (Short & Horne 1985) now common, *contra* Lewis & Pomeroy (1989), del Hoyo *et al.* (1997), and Madge & McGowan (2002). Waters at certain dams when dry conditions prevail, mainly after dark and just pre-dawn, can water any time on moonlit nights. Less restricted to rocky areas than the previous species, found in leleshwa and other bushland, bushed and wooded grassland, and bomas. Has seemingly replaced or partly replaced Lichtenstein's Sandgrouse, and has been seen more widely in the area in the late 1980s and thereafter than it was before then. It often grits in the road in early mornings, and prefers to walk rather than fly if not surprised. Forages along bush-bordered roads much of the day, is not so nocturnal as Borrow & Demey (2001) indicated. Usually occurs in pairs and family groups of not more than five, but in this area, waters in gatherings of as many as 100 or more. As many as 14 groups passed over our camp in 22 min between 05:33 and 05:55 h on 23 December 1993. May be less common in wet periods (see Barlow *et al.* 1997), but at least some are resident. Little known in Kenya, and not mapped for Laikipia by Zimmerman *et al.* (1996), and Stevenson & Fanshawe (2001). *Behavior.* Appear like “walking balls” at times, with dainty feet peeping from beneath the apron-like drooped wings, as they walk and eat grit. Social interactions may compel pairs and groups to fly to water even after good rains have left puddles all about. One M passed grit to a F; the M then lifted its wings, shook them, and bowed to the F. Pairs close to dams may walk to water, rather than flying.

Voice. Poorly known (see Urban *et al.* 1986, Zimmerman *et al.* 1996, del Hoyo *et al.* 1997, Stevenson & Fanshawe 2001 and Madge & McGowan 2002). Overflying birds en route to water may call as many as 15 times in passing from near one horizon to the opposite horizon. The common flight call is a “prippter-eeet-urrrt,” the fourth note dropping in volume and often not audible, or a “prrrt-prrrt, pur-weet.” Interactive birds in a group of four or five may call “pprrrit-pprrit;” a F gave 10 “peet-eet-weet” calls, the M near her responding with a faster “peet-eet-eet.” After interactions and before flight a “pipipipipit-pitpitpitpit” was uttered. At drinking bouts “pur-re-eeet” calls repeatedly were heard, and departing sandgrouse often called “p-p-p-p-pppppt” or “pit-pit-t-t-tttt.” Low notes are “uh, uh” conversational calls, and a “chukkr” uttered before the flight call, heard only when

very close to them. These data supplement meager information in books cited above.

Breeding. Most years breeding takes place December–February, after the little rains, if it is not a wet year with rains persisting into January–February. We base this on group interactions, the occurrence of pairs in that period at intervals as close as every km along some roads, and two records of two adults with three young each (downy going into juvenal plumage, barely able to fly) 24 January 1986 W of Center Dam, and 3 February 1986 NE of the Mukutan River. We also have seen trios and quartets with M, F and juvenal birds May–August (a few of these may have bred as late as March). December adults also tend to hold position, even beside a passing car along the roads and tracks, rather than flying. This behavior suggests a nearby nest or young.

Specimen data. We note several aspects of coloration not well expressed in various books. The M has no markings on its yellowy buff-gray nape, where the F is barred. The black forehead feathers of the M are often erected. The F and juvenile usually show a dusky mark about the ear opening. The M bill is fleshy pink-orange to red-orange, or reddish, with a black tip; in the F the bill is gray to blackish with a horn base and sometimes a fleshy nostril cover. The orbital skin is lemon yellow to gold-yellow in the M, and greenish yellow to pale yellow in the F. The legs behind the white anterior tarsal feathers, and the feet, are pinkish or even red-pink; the legs were stated as whitish and the feet yellow by Madge & McGowan (2002: 458). Juveniles show more buffy barring and mottling above, a dull horn orbital area, a horn-black bill and grayish legs (see Urban *et al.* 1986). Possible seasonal variation exists in the color of the legs and bill of adults, generally reported duller than in our birds.

COLUMBIDAE Pigeons, doves

African Green Pigeon *Treron calva*

Months. All but March; regular at fruiting and flowering trees, especially *Ficus*, resident.

Ecology. Inconspicuous unless calling, often overlooked. Occurs where large trees are present, thus mainly along watercourses. Most frequently seen SE EG, where a small gorge with croton *C. megalocarpus* and *C. macrostachyus*, and Cape Chestnut *Calodendrum capense* trees at its mouth, opening onto a grove of fever trees, is a favorite location for two–15 green pigeons. Always to be found in Mukutan Gorge (Fig. 13) and adjacent riverine woods when *Ficus sycamorus*

and *F. glumosa* are fruiting; also feeds on *Euclea divinorum* fruits. Speedy flight, often through trees, renders them difficult to follow. Eats buds of crotons, feeds at croton flowers (on nectar?). Grits occasionally and eats fallen fruits (Gibbs *et al.* 2001).

Movements. Unknown, sparse February and no March records suggest dispersal outside the area in these dry months. Waters at dams, flying in groups to them at times.

Voice. Variable, call often “pa-trok,” also “tcha-wee-cha.” Song simple “kwik-wik, kwok-wok,” or more complex as “koop-kowp-kowp-gemp-gaweet-pweep-pwee-ew.” Several may call simultaneously, see Urban *et al.* (1986) and Gibbs *et al.* (2001).

Breeding. No records. Especially vocal August–September, December–January; Brown & Britton (1980) gave November–February as likely breeding months in nearby areas.

Tamborine Dove *Turtur tympanistris*

Months. All but February, March, October; records dependent upon site visitation schedule and singing.

Ecology. Found at riverine sites with water, probably decreasing at most of these. Not easily observed unless singing, or flushed. More than 40 records, most frequently noted at NG. Usually near streams in dense cover.

Movements. Locally moves into some areas not otherwise occupied except when wet, as edges of South Boma.

Voice. Very like that of Emerald-spotted Dove, but deeper, often slower, heard April–August and November–January. Gibbs *et al.* (2001) failed to note that its song is slower than that of that species.

Breeding. Singing suggests April–August and November–January, as do relatively few breeding records of Brown & Britton (1980).

Specimen data. One, MK, 18 July 1990, 75.25 g, wing 113 mm, fresh plumage with the outermost primary not yet fully grown, a M (white forehead, Urban *et al.* 1986).

Emerald-spotted Dove *Turtur chalcospilos*

Months. All, common resident except in grassland and pure leleshwa bushland.

Ecology. Ubiquitous, with Ring-necked Dove the commonest dove in the area. Drinks daily, morning and afternoon, hence most common within 1 km of water. It usually forages in cover, but will join other doves and finches feeding in open areas. Bathes when water is available. Seems to interact especially with Laughing Doves which dominate it; sings less when

Laughing Doves are common and singing strongly. Laughing Doves are present for breeding in wet periods, when dry-adapted Emerald-spotted Doves generally are not breeding. Usually found singly or in pairs, rarely seen in loose groups of up to six, in this instance at a dam where likely coming to drink at one location. It flips its tail upwards conspicuously as it lands.

Movements. Sedentary. Lewis & Pomeroy (1989) reported it mainly below 1600 m, but common to abundant in the study area 1800–2000 m, and also common at our Nanyuki house at 1950 m. Gibbs *et al.* (2001) gave 2000 m as its upper limit.

Voice. Speeding up, long song usually uttered in bursts, at intervals, from c. 1 h before dawn to dark. Very like the song of the Tamborine Dove (above), that of the Emerald-spotted Dove is higher-pitched and at times less hesitant (see van Someren 1956). Variations occur, some uttering hoarse notes or doubling of certain notes. Counter-singing is common where territories abut, some songs then having extended, soft, fast, “bouncing ball” ending “-cu-cu-cu cu-cucucucu” beyond usual “cu-cu” end. Songs have been heard in all months, but are infrequent during heavy and repeated rains. Lets several dry days elapse after rains, and may then increase singing bouts until there are further rains. In hand or net bag softly calls “coo-oo.”

Breeding. Probably depends upon the rains of a particular year, in very wet years with continuous rainy seasons, may breed December–January; in drier years may breed following the big rains in late May–June, or in July–September, or in October–December. These are suggested by patterns of song and countersinging. Young birds have been observed or netted in June, December, and (immatures) October–November, and February. Heavily molting adults have been noted in January, April–July, and especially August–September, these presumably representing post-breeding and late breeding season doves. We have not found nests.

Specimen data. 27 adults, four subadults, two immatures netted. Adult MF weights ($n = 27$) 50–69.5 g (58.4 g), non-adults ($n = 6$) 49.5–58.5 g (54.3 g); MF wing length ($n = 14$) 101–116 mm (108.5 mm). Soft-part colors: bill varies from gray with pink tinge to black with a pink base; orbit gray, at times tinged yellow under eye; eye brown, may show hint of red; gape pink with gray-black edging toward bill. Subadults have small or no “emerald spots,” paler immature feathering evident, and cream to white and rusty barring or tints on wing coverts, tertials, the face, back, bend of the wing, underwings, and breast.

Namaqua Dove *Oena capensis*

Months. All; peaks June–September, November–January, most are visitors.

Ecology. Most frequently observed in open areas and roads near water, as at Center, Kuri, near Titus, Center South and Big dams, at acacia crossing, Nglesha and Northern Plain. Most commonly seen in the months noted above, usually in small numbers (up to four). Occurs in larger numbers, five–25, in January–March. Feeds on bare ground and in low grass, grits in roads, drinks in puddles, pools and at dams, and at a cattle dip at Kuti. Suns and dust-bathes occasionally. May feed with other doves.

Movements. Not observed in flights, numbers certainly are lower in late February–May and October. Could move in from lower elevations to the W, as common about lakes Baringo and Bogoria (Hartley 1986). No definite breeding records, but M on eggs in nest at Nanyuki, 30 March 2003, at 1950 m.

Breeding. Only suggestions of breeding are from three instances of singing (July, August, September). We also saw three MM fighting about a puddle in June, and two attacking one another in September. The only juveniles noted were in August–September. They probably breed in the area rarely; they may nest close by, to the W, at a lower elevation (Lewis & Pomeroy 1989). See Gibbs *et al.* (2001) for other behavior.

Eastern Bronze-naped Pigeon *Columba delegorguei*

Months. All but February–March, forest resident at Nglesha Forest.

Ecology. Mainly heard singing; shy, not readily seen. Watered at a stream. An African Little Sparrowhawk called at one perched deep in a dense olive tree for over a minute; the hawk is too small to take such a pigeon. Was seen at no other site but in the remnant Nglesha Forest and its fringes.

Voice. M bows, showing white nape, as it sings to F. Songs are most commonly heard April–July, and in some years in December–January, although we generally heard few or no songs during September–January visits. Gibbs *et al.* (2001) described the three-part song.

Breeding. Mostly or entirely April–July. A M sang 1 m from its mate sitting on a twig nest with two eggs 10 m up *Apodytes dimidiata* tree 17 May 1990; the nest was empty by the first week in July. Courtship was observed in July, and songs are most frequently uttered April–July. This is the first breeding noted in this part of Kenya (Lewis & Pomeroy 1989).

Specimen data. Two MM netted 5 July 1991 and 17 October 1992 respectively weighed 154 and 172 g,

with wings 187 and 175.5 mm. In these the white nape band tends to break up at the side and the major iridescent colors are green in front of the nape patch and violet behind it. Soft-part colors: bill gray with horn to ivory tip; eye chestnut-red or pink-brown; orbital skin pink to pinkish gray (in latter, July, M, the front of the orbit was pink). Coloration we find best matched in description in del Hoyo *et al.* (1997), except for eye color. The subspecies is *C. d. sharpei*, although more violet on the hindneck than shown by Gibbs *et al.* (2001).

Olive Pigeon *Columba arquatrix*

Months. All but March, only four records between 2 February and 14 May, sparse November records. Non-resident, breeding and fruit-feeding visitor, often abundantly.

Ecology. Appears, often in numbers to 400 in a day, to feed on olive, *Euclea*, *Croton*, *Apodytes dimidiata*, and other fruits. When visiting, may travel to dams for water in flocks, and roosts in flocks in dense trees, or in one case, near a Tawny Eagle roosting in a fever tree. Flight very fast, at low elevations through trees with "whoosh" as they fly past. Meets Speckled Pigeon at dams, as at Lugwagippe, but no interactions noted.

Movements. Comes into the area usually in late May, rarely as early as April; fewer seen October–November, present in most years December, January, disappears in February. Absent at lower elevations to W (Hartley 1986), pigeons come from forested highlands to the S (Lewis & Pomeroy 1989).

Behavior. M frequently claps wings in flight, not only in displays to F; also has wobbly display flight, and wing claps in high, gliding displays about F accompanied by repeated "ooo-aa" notes (resembling those described by Gibbs *et al.* 2001). One beat off an attack by a Red-eyed Dove, bashing the latter with its wings.

Voice. Song June–September, in some years less frequently heard November (rarely)–January; more of a deep, double-noted "yoh-hoo," (Gibbs *et al.* 2001) than described in Urban *et al.* (1986).

Breeding. Nests about 12 June–October (seven in August), at 3–14 m in trees of *Olea europaea africana*, *Euclea divinorum*, *Combretum molle*, and *Acacia xanthophloea*; the single one in the last tree at 14 m was destroyed by baboons. Also adult seen carrying twigs to nest in August, and displays in these months (June–October), and in January. May nest as close as 10 m in dense, adjacent trees when olives are heavily fruiting. We could not check the contents of most nests; two eggs were seen in several (including one 3 Oc-

tober 1986). Nesting thus is between the two major rainy seasons, through the July–August rains, and following rains (see Urban *et al.* 1986).

Specimen data. Three netted; two likely MM, 420 g with 223 mm wing, 29 December 1989, and 497 g, 241 mm wing, 15 September 1988; one subadult (rusty scapular areas) at 314.5 g, 17 December 1995. Only the last was molting (body and head mainly fresh adult, wing molt with first three primaries new). Soft-part colors; adults with yellow bill, cere, legs, feet, claws; orbit yellow with reddish tint; iris green-yellow. The subadult had a yellow bill with orange-gold cere and corners of the mouth; orbital skin yellow, gold around eye; eye gray-olive; legs and feet yellow. The greatest weight considerably exceeds those of Gibbs *et al.* (2001).

Speckled Pigeon *Columba guinea*

Months. All but March, resident in settlements just S of Ol'ari Nyiro border.

Ecology and Movements. Pairs breed in buildings of Kuti, Center, and likely Nglesha, but are not always present there (may feed out from them, and go to water elsewhere). Birds from settlement S of Lugwagippe Dam drink, perch and court there. It can be expected occasionally flying over any part of the area, and may drink at any dam. Usually feeds in cultivated fields and pastures about habitation. Possibly some records of birds flying over could represent Feral Pigeon, which has been reported, but not seen by us, at Center. Noted at all central and S sites, and at many dams. Usually observed in small numbers, up to four, but flocks to 20 have been seen.

Breeding. May–September and December–February, especially in July (between the big rains and August–September rains), judged by songs, wing-snapping and aerial displays, and July nests with young at Center. Nests seen were on internal cross-beams of garages and sheds; two such fledged two young each in late July–August 1997. At least in our area it is not the dry season breeder reported by Gibbs *et al.* (2001).

Feral/Domestic/Rock Pigeon *Columba livia*

Notes. Reportedly seen at Center, and possibly at Nglesha, and a few overflight records of Speckled Pigeons conceivably could be of this species. We can report no definite record, and note that all pigeons seen in the nearest major town, Kinamba, have been Speckled Pigeons. There may be one or more persons in the general area holding this pigeon in lofts, so those could well occur sporadically within the study area. See discussion in Lewis & Pomeroy (1989)

Dusky Turtle Dove *Streptopelia lugens*

Months. All but March, absent in drought years.

Ecology. In most years arrives en masse, usually late May–June, occasionally as early as April or as late as July; usually some present December–January as well. Comes to the area to feed, as well as for breeding. Favors the S part of the area, especially the South Boma and Dirty Dam (where roosting and gathering when in numbers). Feeds in cropland at Nglesha. Drinks at various dams. Also suns in mornings, sometimes at dam shores with the following two species of doves.

Movements. Comes in as noted above, masses in September–October to depart, but none appeared in 1984–85 drought year, and few in 1987 and 1991. See Lewis & Pomeroy (1989) regarding movements and wandering.

Voice. Usually reported as a deep series of double notes, is almost a deep growly purring song, as “ggrewaa, ggrewaa, ggrewaa, ewaa, ewaa, ewaa” (see Urban *et al.* 1986).

Breeding. From songs, courtship flights and August nest, is usually June–August, occasionally perhaps May–September, and, in some years November–January, not December–June as Gibbs *et al.* (2001) reported. The only nest that was occupied, at Nglesha 31 August 1992, was a flimsy stick nest atop an *Acacia abyssinica*; two eggs could be seen through the sticks against the sky. Urban *et al.* (1986) and Gibbs *et al.* (2001) described the courtship that we observed in June–August; see van Someren (1956) for more on nesting.

Specimen data. The three specimens, two from MB and one from NG in December–January, were all molting rectrices and primaries, as well as other feathers, the January bird being nearly through with its molt. One weighed 195 g; attendance on honeyguides prevented full treatment of all three doves. Soft-part colors: bill gray; orbit red-pink; iris pink-orange. Del Hoyo *et al.* (1997) noted variations in these colors; see also Gibbs *et al.* (2001).

Red-eyed Dove *Streptopelia semitorquata*

Months. All, see movements.

Ecology. Moves in to breed at central and N sites, may flock to 50 or more when incoming, or outgoing. During movements tends to roost and feed out from dams with wooded walls. Feeds mainly on fallen seeds, also on fruits including the berries of *Strychnos henningsii*. Generally occupies taller, more dense habitat than the following dove, but breeds under favorable

conditions in open wooded grassland and in bushland, leaving such areas when finished breeding.

Movements. Present year-round in small numbers at S sites, especially Nglesha, and a few persist at well-wooded sites through dry periods. During wet years with well-spread rainfall can be ubiquitous, although never so common as the following species. Usually returns in numbers during April–June; some move about or depart thereafter, but many remain through August or September. Generally occurs in lower numbers November–February, but during unusually wet years this may be the major period of breeding. Congregates about dams, and flocks of five to 15, occasionally many more, bullet through valleys as they disperse to breed, or following breeding. Absent from less lush sites for half the year or more in most years. See also Lewis & Pomeroy (1989).

Behavior. Well known. Occasionally aggresses at other species, as Olive Pigeons and rollers, that may chase or attack this dove in response. Some “towering” displays (Urban *et al.* 1986) involve two or three upward climbs and glides, the dove then descending with a “wuff” call as it lands.

Voice. Cooing song well characterized by the phrase “Don’t do it, the ‘toto’ (child) will see you!” of six to nine notes (Borrow & Demey 2001 gave it only six notes), uttered in bursts at intervals; nearly continuously given when one or more other MM sing and countersing nearby. Other calls when bowing or otherwise displaying (Urban *et al.* 1986).

Breeding. Generally as Brown & Britton (1980) noted, from April or May–July, following the big rains; sometimes later, into October, if there are heavy July–September rains. Some nest November–February, especially in very wet years with rainfall over most months. Nests in April–July and October were in species of *Rhus*, *Olea*, and *Euclea*, among other bushes and trees, most at 2–4 m. Courtship has been noted in April–September, and December, with copulation observed in December. Immatures seen April–July, September and December. Multiple broods not noted (see van Someren 1956). Does not always nest over water (*contra* Gibbs *et al.* 2001).

Specimen data. All but two of nine that we handled in May–September (this dove usually crashes through, or gets out of nets) were in molt, including primaries. The innermost rectrix (1) is often held long after the other rectrices are molted; one showed the tail molting inwardly from rectrix 6 and outwardly from 2, with number 4 last, except for rectrix 1, i.e., rectrix 4 was the penultimate to be molted. Weight:

(n = 9) 191–242 g (216.9 g), unsexed, wing length: (n = 6) 179–192 mm (185.8 mm), unsexed. Soft parts: Bill blue-black, gape pink. Eye brown with a narrow to broad orange to red outer ring, or brown-red with crimson outer ring, or all orange to red (possibly outer ring increases in orange or red, the inner brown diminishing as dove comes into breeding condition). Facial-orbital skin from pink or purple- or violet-pink to rose-red, purple-red, red or crimson. Legs and feet paler, pink-mauve, or red or crimson. Colors of soft parts vary more than indicated in Zimmerman *et al.* (1996) and del Hoyo *et al.* (1997), or Gibbs *et al.* (2001).

Ring-necked Dove *Streptopelia capicola*

Months. All, nearly ubiquitous.

Ecology. Occurs at times in all habitats except the forest patch at Nglesha (and dense woodlands in wet periods), including open areas, although less likely than Laughing Dove in extensive open grassland. Our study sites tend to be wetter than many habitats in the study area, so usually found year-round. At GMF camp in bushland, one or more pairs present except in extended dry periods, when they leave the site. Is the most numerous dove in the area, except in wet seasons may be outnumbered in some habitats by Laughing Doves. Feeds on the ground, usually near bushes or tree cover. It extracts seeds from pods of the fever tree *Acacia xanthophloea*. During a termite emergence one rushed to and fro chasing after termites on the ground, and succeeded in taking 25–30 in *c.* 7 min. Readily joins other doves especially Laughing Doves foraging in small open areas.

Movements. Disperses in flocks of less than 20 after breeding, when congregating about open areas and walls of dams, as well as in cultivated fields. Numbers definitely fluctuate. Flocks usually move in during March-May. Numbers are augmented in rainy seasons when flocks appear from the south; dispersing flocks move about and may leave the area in drought periods. We have seen a flock of four fly in from the S and perch in a tree; when one started to sing, the local territorial M flew into the tree, attacking them, and the four immediately flew N together, rising high above the site and disappearing from view. In drought years sites occupied are limited; numbers are much lower than in “normal” years. A few pairs of this and most doves are resident at Kutí, Center and Nglesha.

Behavior. Often supplants smaller birds, as the Scaly-throated Honeyguide, followed by its singing. Aggres-

sion extends to larger species. We have seen it flail its wings to drive away a Broad-billed Roller and one flew to a Spotted Thicknee, battering it with the wings and chasing it. Displays are those characterized by Urban *et al.* (1986) and Gibbs *et al.* (2001). MM fighting may land on one another, even attempting copulation at either end of an antagonist. Rarely attacks Red-eyed Dove; may ultimately supplant it by consistently returning to a position until larger dove “gives up.” *Voice.* Well known song, locally rendered “Na-ku-ru” in Kenya, heard all year, except in extended dry periods and drought years. Exceptionally, singers add a syllable, a “Na-koo-ah-roo.” Songs are in bursts of six to 18, these bursts being more frequent when there is countersinging. When breeding sings into the night, even all night. Muffled “r’koo, r’koo,” notes heard from fighting MM, with bowing, fluffed plumage, and wing-bashing.

Breeding. Can be at any time of the year (Brown & Britton 1980, Gibbs *et al.* 2001), nests found in all months except February–March. Most nests and observations of courtship and copulation are from April–September and December–January. Nests were at 1–4 m in such trees or bushes as those of leleshwa, olive, *Acacia gerrardii*, and *Rhus* sp. Nest sites much as in Laughing Dove; more often in an isolated bush in somewhat open areas, and lower than in Red-eyed Dove. Eggs and young are frequently lost to predation and very heavy rains. One nest site was used in consecutive years (uncertainly by same pair), despite failure of the nesting the year before.

Specimen data. Specimens from November–January and April–August (n = 19) showed molt in all these months; the seven non-molting doves represent April, May, July, August and December, in all of which months there were as well one or more molting birds handled. Individuals likely vary in their breeding and molting regimes. Weight: (n = 19) 120.5–160 g (139.7 g), unsexed; two pairs taken (MF together in same net) showed the M heavier by 7.5 and 16.5 g. Wing length: (n = 7) 149.5 mm–158.5 mm (153.2 mm), unsexed. There is presumed to be a meeting of N race *somalica* and S race *tropica* in the region (Urban *et al.* 1986). However, specimen weights are within and beyond the range given by those authors for larger, darker *tropica*, and wing lengths are entirely greater than the range they and Gibbs *et al.* (2001) gave for *somalica*, so *S. c. tropica* is the W Laikipia form. Soft-part colors: bill black; gape mixed pink and black; orbital skin whitish in some perhaps subadult birds, gray-yellow, dusky yellow, or pale yellow (one

pair: M pale yellow, F paler gray-yellow); eye dark brown to red-brown; legs and feet purplish pink, paler, pinker in subadults or non-breeding adults. Sexes not alike in all soft-part colors (see Urban *et al.* 1986), nor are these colors so uniform as those authors and Gibbs *et al.* (2001) reported.

Laughing/Palm Dove *Streptopelia senegalensis*

Months. All, but mainly April–September, rarely resident.

Ecology. Rain-dependent, appears in numbers during big rains, although numbers vary. In years of plentiful rains can outnumber Ring-necked Dove while breeding. One or a few can be found in dry periods at Kuti and Center, and Nglesha. Woodland edges, open woods, bushland and grassland with bushes and trees scattered about, as well as the vicinity of buildings, are favored habitats. Readily associates with other doves. Eats insects as well as seeds, especially emergent termites (see Cramp *et al.* 1985, Urban *et al.* 1986, del Hoyo *et al.* 1997 and Gibbs *et al.* 2001, for food, displays, etc.).

Movements. Moves in from the S in April–June, from cultivated areas in that direction, numbers and time of influx depend upon March–May rains. Gathers and disperses July onward, persisting until October when July–September rains are significant. Some remain at S sites, especially Nglesha, and about houses and gardens.

Behavior. Less pugnacious toward other species than is Ring-necked Dove. Chases Emerald-spotted Doves, seems to interact frequently with that species; at times sings in response to Ring-necked Dove songs. Emerald-spotted Doves sing very little when Laughing Doves are numerous and singing. The latter “interaction” may reflect their different preferences for breeding conditions more than direct competition.

Breeding. Nests ($n = 22$), courtship and copulation occurred May–October, except for one nesting in December at Nglesha; half the nests were found in July–August, usually a somewhat rainy period following the main rainy season. Nests were at 1–3 m (av. 1.9 m) in various bushes and trees, including *Acacia kirkii* and *A. gerrardii*, olive, *Euclea* sp., *Rhus* sp., and lelesha. Most were obscured by foliage and broken bits of bark on trunk, but one was in a small, dead olive, and several others were rather conspicuous (made more so when a M Laughing Dove sang beside or in the nest).

Specimen data. Of 14 adults handled, all netted May–September, only four were molting, all representing August–September. Three subadults were examined,

representing October, November and December. These data contrast strongly with the more diversely molting and breeding Ring-necked Doves. Weight: ($n = 14$) 83–108 g (92.9 g), unsexed; wing: ($n = 13$) 126.5–145 mm (134.7 mm). The three subadults weighed less, at 69.5, 73 and 73 g. Measurements and weights accord well with data for *S. s. senegalensis* in Urban *et al.* (1986). Soft-part colors are well known; the orbital skin is pink-purple to purple-pink in likely MM and some FF; other likely FF have a gray orbit with some pink or red in the rear half. We saw none with a bluish gray orbit (see Gibbs *et al.* 2001).

PSITTACIDAE Parrots, lovebirds

Red-fronted Parrot *Poicephalus gulielmi*

Months. January, July; two records.

Notes. This parrot feeds outward from the highland forest it occupies. Particularly in January–March, but at other times also, they pass daily, for example, from Mt. Kenya's slope N over our Nanyuki home, returning late in the afternoon. Two of these parrots flew high over us early on 1 July 1988 at MB, they uttered their distinctive calls (which include a melodic, whistled note, not in Fry *et al.* 1988) as they flew. On 4 January 1997 at Nglesha a group of three flew N over us, followed shortly by seven more calling parrots, then three more that circled to the N of us and went back to the S (at one point Brown Parrots called about us as the Red-fronteds called overhead). These presumably came from remnant highland forest S toward Nyahururu and the Nyandarua Mountain forests. Movements were discussed by Lewis & Pomeroy (1989).

Brown/Meyer's Parrot *Poicephalus meyeri*

Months. All; resident.

Ecology. Resident, but wanders into surrounding areas unoccupied by parrots. Usually observed in pairs or small (family) groups of no more than six (we have seen seven apparent adults in interactions, and up to 12 in fruiting trees at Nglesha). Foods include olives, berries of *Euclea* sp. and seeds from pods of *Acacia gerrardii* and *A. xanthophloea*. Sings at times in canopy of woods, where inconspicuous. Drinks from crevices in trees, dams, cattle troughs, and rivers. Flies short distances, and rarely much above the tops of trees. Present at all sites, but numbers decrease during extended dry periods. Up to four pairs at better wooded sites.

Movements. Only locally, seen crossing some grasslands (distance to 300 m) low above the grass.

Behavior. Often noisy and conspicuous, partly due to competition for nesting cavities that causes fights with, e.g., rollers *Coracias* spp., Greater Blue-eared Glossy Starling and Rupeppell's Long-tailed Starling, Bearded Woodpecker and even Yellow-throated Petronia, and with honeyguides. Rather persistent in returning to contested cavities, and seeks to enlarge smaller entrances by biting the top of the opening. Seems to roost in holes (Forshaw 1989), increasing interactions with hole-nesting neighbors and competitors.

Voice. When landing, a "yip-yip" to "pyeep-pyeep." In hand, a "skeeeek." Screams at avian predators.

Breeding. Very difficult to ascertain, especially as they regularly investigate holes and roost in them. Our records of feeding of nestlings, of fledglings, of copulation and other displays indicate breeding April–September and December–January. Nests in old woodpecker cavities or natural holes at 2–7 m. Nest may be usurped by honeybees. Displays include: hanging from the nest entrance with wings flailing (showing off the yellow on the wings); courtship feeding; allopreening; fluttering flight; gliding, set wing flight of M to F, with M cocking tail as it lands; and fluffing of the feathers, "prancing," and bowing of one adult to its excavating mate (see Fry *et al.* 1988). One copulation commenced after both birds flew in a stilted, buzzy flight to a perch, the M mounting, courtship-feeding the begging, soliciting F; the copulation lasted 9.5 min without audible calling, after which both screeched, the M flew off, and the F remained perched for *c.* 30 min. Generally two young fledge, but groups of five or six suggest that occasionally three or even four young are raised successfully (Tarboton 2001 gave three as usual clutch, also two to four eggs). We lack information on dispersal of the young. Only pairs have been observed where nesting was evident, so dispersal occurs prior to the next breeding period.

Specimen data. Only six were netted; of these, July, August and December parrots were molting flight feathers, whereas April, June and August individuals were not molting. The June parrot had eyes mainly brown, and little yellow in its undoubtedly subadult plumage. Weight: (*n* = 5) 107–125 g (117.9 g), unsexed, except lightest parrot had a receding brood patch and probably was a F. Wing (*n* = 3) 143 (likely F), 146, 155 mm. Adults vary in the extent and symmetry of yellow in their plumage. We noticed that the outer three rectrices usually are tipped yellow. Some variations may be sexual, perhaps. The subspecies represented is *P. m. saturatus*. Soft parts: Bill gray-black,

gape black, tongue pink-gray; orbit gray-black. Eyes generally orange near the pupil to red outwardly; ruby orange is a fitting description. The entire iris may be crimson. Apparently the eye is brown in immatures (Fry *et al.* 1988); it acquires a red outer ring, and then the brown gives way to orange as the young develop. Legs and feet gray-black to grayish, toe pads yellow-gray, claws black.

MUSOPHAGIDAE Go-away birds, turacos

White-bellied Go-away Bird *Corythaixoides leucogaster*
Months. Resident.

Ecology. Common in open woodland and bushland, especially *Acacia gerrardii* woodland in N and central parts of study area; always found at Kutu and Center. Forages from ground and low bushes to canopy, singly, in pairs or in family parties of three or four. Moves about adjacent to breeding centers, disperses occasionally to the S areas such as LU and PO, where Hartlaub's Turacos also occur; more often may meet turacos in central sites, as near the Mukutan River and its tributaries. Takes as many as 20 billfuls of water when drinking. Eats fruits such as those of *Rhus* sp., olive, and *Jasminum fluminense*, flowers of *Jacaranda mimosifolia* (for up to 20 min at a feeding) and *Acacia gerrardii*, and beans from pods of *Senna didymobotrya*; also insects, especially in feeding young. Flycatches at times, particularly for flying termites. No animal foods were noted by Fry *et al.* (1988), or del Hoyo *et al.* (1997).

Movements. None, except dispersal of young and post-breeding, dry-season foraging trips into areas adjacent to breeding sites.

Behavior. Flies single file over open areas; flight slow, and risks predation flying and foraging in open areas. Sings itself at times in acacia tops. May chase other species, e.g., Black Cuckoos; one feeding in a jacaranda was chased continuously by a Superb Starling all about the tree, holding its crest up and wings out as it fled.

Voice. Gives single "kuk" or "kwaa" notes; songs, a series of these (as "kwuk-kwuk-kwuk-kuk-kuk"), can be heard to some extent in every month. "Duets," rather simultaneous singing, occur mainly or entirely in the breeding season.

Breeding. One nest in June (of sticks 3.5 m up a *Euclea* sp. tree, one or two nestlings 17 June–20 June, then empty), copulation in July, newly fledged young in May, and extensive singing April–August, suggest that period as the usual breeding season, but may breed

later, to December, at times (Brown & Britton 1980 gave only March–April records). Copulation was marked by the F soliciting, crest lowered, to the crest-raising M. Distantly observed regurgitation of food by two adults or an adult to an immature on 3 December 1994 is indicative of late-year breeding. Two lax-plumaged, newly fledged birds at TA (Fig. 8) on 25 May 1995 had a narrow, partial crest, gray (rather than brown) eyes, and a black bill. Two long-crested, yellow-green-billed adults accompanied two fluffy, lax-plumaged, very short-crested, black-billed immatures at acacia crossing 10 January 1996. Since most observations suggested that this go-away bird locally nests in pairs (one record of a trio, Irvine & Irvine 1977), and the bill color of both paired birds sometimes is yellow-green, we are unconvinced that MM are always black-billed and FF all yellow or yellow-green billed (from Jackson & Sclater 1938, see Zimmerman *et al.* 1996, del Hoyo *et al.* 1997). Fry *et al.* (1988) noted the bill as dark brown, pea-green or olive in both sexes. A similar problem exists with the Gray Go-away Bird *C. concolor*. Studies are needed! One black or brown-billed immature among three immatures accompanied by one yellow-green-billed adult at GMF 1 January–5 February 1996 showed the base of the bill turning greenish.

Hartlaub's Turaco *Tauraco hartlaubi*

Months. Resident, mainly SW; extension of range and breeding (Lewis & Pomeroy 1989).

Ecology. In 1980s common in densely wooded sites of the Mukutan River and its drainage N to UL, E to MB and OD; became more restricted to NG, PO and LU in the S during the 1990s, seen at MB in 1998, no pairs where formerly seen and heard regularly, as at MK, LA and EG. Feeds on fruits such as figs and those of *Euclea* sp., and *Scutia myrtina*. Also jumps at emergent termites. Drinks from tree crevices (15 times in succession).

Behavior. Sometimes chases other species, as Black Cuckoo. There is a long account of this turaco, including calls, by van Someren (1956).

Voice. Duets, M with "kow," "haa-aaw," "raaaaw," "k-raaaaw" or "graww" notes, to 10 or more, F with "ki-kik" or "kip" notes between each pair of M notes. Also "kaa-aaw" or "ooooaaw" notes as turaco throws head backwards, or slowly lifts it rearward, to touch its back. Songs of single bird heard in every month, over the years. It also has soft "eh" notes, and a nasal trill "uh-uh" to "kdddddd."

Breeding. Breeds mainly May–September, also October–January in places and at times, based upon dis-

plays, duetting, copulation, courtship feeding and presence of weakly flying immatures with adult. Juveniles seen mainly August–September, but copulation noted to mid-September. Brown & Britton (1980) had records from all but two months, but many from Nairobi gardens.

Specimen data. In most cases turacos fly through the net, or tear their way out; two non-molting adults taken in May and June weighed respectively 229 g and 245 g. Soft parts: The bill was dusky olive-pink, and pink in the two adults (not olive with pink tip as in Fry *et al.* 1988, nor dark red of del Hoyo *et al.* 1997); "orbital" skin red, warty and extended considerably posterior to the eye; this is a facial-orbital, not an orbital ring (Zimmerman *et al.* 1996).

CUCULIDAE Cuckoos, coucals

Great Spotted Cuckoo *Clamator glandarius*

Months. November–January, April–July; irregular visitor, possibly could breed.

Notes. 13 records, two in November, one each in December, January, and April, three in May, two in June and three in July, all of apparent adults. The preponderance of records April–July indicates that most if not all were local Kenyan birds (four fall in the October–March period for N migrants, Zimmerman *et al.* 1996). Perhaps up-slope wanderers from the Baringo area where it has bred and is known from throughout the year (Stevenson 1980). Most perched in a bush or tree in open areas. One was dust-bathing in the road S of Center 5 May 1996. On 14 July 1989 one flew N in the lugga at MB; as it flew out of a tree a second joined it in flight. Its song has not been heard in the study area, although possible hosts, including several species of starlings (Fry *et al.* 1988) suggested that it could occasionally breed there.

Black-and-white/Jacobin/Pied Cuckoo *Clamator jacobinus*

Months. All but October; breeding visitor April–September.

Ecology. Breeding visitor in most years; absent in drought years as 1984, and very few in some other years. Over 70 records (a bird seen daily for a month is "one" record) April–August, only nine records September–March. Some of the latter could represent visitors from the Indian subcontinent, but one on 1 February 1998 sang, and all sightings seemed to be of the race *C. j. pica* (the local breeder and wanderer). Occurs generally in bushland and degraded woodland, and in open acacia woodland; is conspicuous,

more so than the following species. Occasionally in mixed-species foraging flocks with helmetshrikes *Eurocephalus* sp., orioles, Superb Starlings, and finches and serins. Presumably somewhat dependent upon caterpillars appearing in numbers during wet years.

Movements. Appears in April–May; sings, presumably breeds, and leaves by September, except for a few.

Behavior, breeding. Little evidence for breeding other than presence, songs and chases with association in pairs April–September. The season varies with rains, e.g., April–July 1986 and 1990, June–September 1989. Two sang near one another at TA 26 June 1994, one then carried a caterpillar to the other (in a dense bush) and both sang again. Seen several times near host (Fry *et al.* 1988) Rufous Chatterer, none seen about bulbul nests, nor were juveniles noted. Brown & Britton (1980) gave March and May breeding records for the region.

Voice. High “piping-cackle,” in two parts, as in Fry *et al.* (1988), clearer, higher-pitched than in the following cuckoo; especially early and late in breeding initial “peea” or “pew” part is uttered alone. Playback of song of S race *serratus* elicited approach, and shorter song interval. Also utters a growly “kkrew” (voice tape-recorded).

Levaillant’s/African Striped Cuckoo *Clamator levaillantii*

Months. All, mainly breeding visitor April–July, sometimes to September; few October–March.

Ecology. Caterpillar-dependent, babbler-parasitizing cuckoo, appearing usually in April, leaving variously in July, August or September. Ranges through all open and edge habitats, seen or heard at or near all sites. Forages for caterpillars and other insects in foliage. It and the Diederik Cuckoo are the third commonest cuckoos after the Red-chested and Black cuckoos. One foraged for wax-worms (*Galleria* sp., Lepidoptera) in drying beeswax of our shed. Another ate larval *Cirina forda*, a colorful, large saturniid caterpillar on *Euclea* sp. trees.

Movements. Occurrence in over half the years in April–July, in four years in August and January, in three years noted for September, and in one year only for February, March, October, November, and December. Appears in April to early May, leaving in July–September. The October–March cuckoos could have been stragglers, but noted singing in October 1992, and during January–early February, and late March of 1998. None of Stevenson & Fanshawe’s (2001: 188) patterns fit these occurrences. Three far-flying

Levaillant’s Cuckoos observed 18 July 1992, flying SW over the Mukutan River. Babbler hosts breeding other than about the big rains, i.e., April–June, might avoid nest parasitism by this cuckoo. It often is common (see Lewis & Pomeroy 1989), certainly much more so than the Black-and-white Cuckoo.

Behavior. Interacts with Black Cuckoos, Greater Blue-eared Glossy Starlings, and White Helmetshrikes, as well as with its two babbler hosts, the Brown and Black-lored babblers; we saw nine episodes of mobbing or attacking of Levaillant’s Cuckoos by babblers. *Voice.* Usual song a series of “skreek,” “skew-eeet” or “screeyew” notes followed by a woodpecker-like trill. One song was of 48 notes in 42 s. The vast majority of full songs were heard late May–early July. In our experience tends to utter songs of only one part early and late in breeding, and during interactions. Interactions also involve shorter versions of song-like notes, as “kur-reek,” “neeeek,” “gwaik-gwaik,” “pi-pi-wik,” “klik-it, klik-it,” and a “ki-ki-ki-kit.” High, piping “pi-pi” notes also have been heard (like calls of Hemprich’s Hornbill), one called “kla” at chasing Brown Babblers and an immature uttered a series of nasal “nyenk” calls that were like notes of Red-fronted Barbets. Also gives low “kek-kek” and “chuk” notes. The variety of calls not covered by Fry *et al.* (1988) or Maclean (1993); we recorded many.

Breeding. Juveniles with accompanying Brown Babblers were observed in June–July; a fledgling 10 September 1986 was followed about by a glossy starling. Independent immatures were observed July–August. Copulation was observed in June. Nocturnal singing occurred only in June–July, as did intense displays and back-forth chasing lasting five min or more, and involving two or three cuckoos. One apparent display is of one (M?) flying to the other with head held high and crest raised; both sang, “chased” about, called low “shreek” notes and simultaneously called “yu-wek, yu-wek.” We have observed three excited birds, with Brown Babblers nearby, chase, hop and jump about in a croton tree, screaming (“skreek”) at one another for 15 min. A sky-pointing display of one to another with crest lowered bill straight upward, was noted, as well as M-F displays reported by Fry *et al.* (1988). Brown & Britton (1980) had no records of breeding in our region.

Specimen data. None was netted (several went through nets). May–July birds are in “ragged” plumage. One in tail molt was noted in June, and a July cuckoo was molting primaries and rectrices. Another on 19 September was obviously in molt.

Red-chested Cuckoo *Cuculus solitarius*

Months. All but October, but only 10 records September–March; breeding visitor April–July.

Ecology. Breeding visitor, numbers less than of Black Cuckoo, more a woodland-riverine woods species than that species. More common in wetter years, when caterpillars are abundant. Often sings briefly, then disappears, especially in bushland situations, so moves about considerably, “test-singing” here and there. It and Black Cuckoo seem not to benefit from July–August rains, they are dependent upon the big rains of April–May.

Movements. Enters the area in April–May; depending upon rains, leaves from July–September. The 10 records of singing September–March in no case were followed by songs on other days; thus there was one song 18 September 1995 at EG, several songs 2 December 1994 at LA, and a few songs 23 February 1991 at MK. One “repeat” singer in 1998 sang 30 January, and again 5 February; the influx of cuckoos began 3 April 1998. So September–March birds may represent casual wanderers, or very late, or very early migrants not fully ready to breed.

Behavior. Chased by various birds such as African Drongos, Black Cuckoos, and Hartlaub’s Turacos. At times flips wings out and up, separately, i.e., left then right, or *vice versa*. See Fry *et al.* (1988) for other displays.

Voice. Both “IT will rain!,” and supposedly F trill songs heard April–July. We have seen two together, one having sung (“IT will rain!”); both then uttered “pik-pik” trills. Main song uttered at night only May–July. Rate of main song when countersinging to 25 per min.

Breeding. Breeds May–July, copulation seen in June, immatures noted June–July. Courtship chases, cuckoos flying about holding caterpillars seen in May–June. Copulation followed, M, in fluttering flight over F; landing, F crouching and drooping wings, and M mounting. A juvenile fed by Heuglin’s Robin-chat 23 June 1997 had a gray orbit, black bill and gold-orange gape. Another 2 August 1987 also was fed by that robin-chat, and called “weep” to “seee-up.”

Specimen data. Taken May–July were two MM and five FF; only the one July bird was molting. Weight: MM 78, 90 g; FF (n = 5) 67–96 g (79.3 g); wing: MM 162, 175 mm; FF (n = 4) 158–177 mm (168 mm). Notes on soft parts: maxilla black; mandible half or more yellow basally, two showed orange at base of mandibular tomia (gape shows orange at corners of bill base), one F had a mainly yellow mandible with

dusky at the tip and along its tomia. The gape was gold to orange (“ripe mango orange!”); one F showed a yellow gape when excited and first removed from the bag, then a more orange gape as she relaxed. Orbit: lemon yellow to bright gold-yellow (see Fry *et al.* 1988).

Black Cuckoo *Cuculus clamosus*

Months. Once January, breeding visitor April–July or August; rain-dependent.

Ecology. Usually the commonest cuckoo April–July, ubiquitous in bushland, woodland, riverine woods and wooded grassland, working through low bushes as well as trees. In some drier years, as 1993, it may be the only common cuckoo, despite lower numbers than usual. Seen at NG 4 January 1997, otherwise absent outside breeding period. Caterpillar-dependent.

Movements. Incoming April–May, departing July–August (only present into August during four years).

Behavior. Difficult to observe, keeps in foliage. Sings in reaction to songs of Red-chested and Levaillant’s cuckoos, supplanted singing Red-chested Cuckoo, and sang in its place. Seen in floppy flight with head raised, searching, singing or not. One made three circle flights of 80 m in diameter, perhaps a M over a F.

Voice. Well known, slow “it – will – RAIN” song and fast song of F heard only April–July. Early and late in season, and when starting to sing early in the day, M may give but one or two notes of song. Sings at night May–July, extreme dates of songs over the years, 1 April–27 August, possibly into September during 1996.

Breeding. Presence of cuckoos April–August, night singing May–July, F song April–July, all indicate breeding at this time, when chorus of this common cuckoo can be overwhelming. Nonetheless, we have seen no juveniles with foster-parent bush-shrikes, their known hosts, some of which at times breed outside of the Black Cuckoo’s breeding season, when the latter is absent.

Specimen data. Ten adults were netted, only two of which showed molt (on head, body, late July and August individuals). The 10 were netted 26 April–13 August, seven of them in May and July. None of these was so black as adults of either sex shown for *C. c. clamosus* in standard works (Fry *et al.* 1988, Zimmerman *et al.* 1996, del Hoyo *et al.* 1997); all showed brown to chestnut-rufous, and some to extensive barring below. Thus these birds appear to resemble

W Kenya intergrades of *clamosus-gabonensis* illustrated in these books. Weight: ($n = 10$) 82–93 g (86.4 g), unsexed. Wing: ($n = 10$) 166–174 mm (169.5 mm), unsexed. These measured data are very uniform (see Fry *et al.* 1988). Soft-part colors: black bill shows pink corners, gape pale pink, tongue fleshy yellow. Orbital skin gray to gray-black, sometimes paler in front of eye, in one cuckoo whitish. Eye deep brown to red-brown. Legs pinkish with gray scutes, toe pads yellow-pink. These colors are from presumably breeding adults and more detailed than in Fry *et al.* (1988) and del Hoyo *et al.* (1997).

Common/European Cuckoo *Cuculus canorus*

Months. Only March–April in 1994, 1995 and 1998. Irregular passage migrant.

Notes. Seen 4 April 1994 at EG. In 1998 there was a movement through more open bushland, one seen 20 March, another flycatching in the rain 10 April, six scattered along roads 11 April, and two in the central part of the study area 13 April. A M was netted at SI on 14 April 1995. Weighing 103 g, with wing 229 mm and tail 164 mm, this was a pale gray cuckoo with very fine, incomplete bars below (bars black-gray, centers often broken, measuring *c.* 1 mm deep), bars on belly partial, not crossing each feather fully, and very sparse, thin bars on undertail coverts. It clearly was of the Asian race *C. c. subtelephonus* (Cramp *et al.* 1985). This Common Cuckoo had a gray-brown maxilla with yellow about the nostrils and rami, and a green mandible with a yellow base, orange gape and pale yellow orbital ring. Probably overlooked in the press of other studies, as we could not closely observe every “African Cuckoo” noted. The boreal spring occurrence is in accord with more marked migration to N than to S (Lewis & Pomeroy 1989) in Kenya.

African Cuckoo *Cuculus gularis*

Months. April–July breeding visitor, seen only once September, once November.

Ecology. Rather strictly a breeding visitor, arriving 7 April–early May, departing in late June to late July; very low numbers in some (drier) years, in “good” (wet, caterpillar-rich) years locally common, then at some sites second only to Red-chested or Black Cuckoo as a singer. One seen at ML 30 September 1995, another perched and in flight with a caterpillar S of Center 19 November 1994, are the only records outside of April–July. When common it is at all woodland, bushland and *Combretum*-grassland sites; singers have large ranges, hence not more than two per site. Feeds on caterpillars and other insects; one took

2 min to swallow a caterpillar. Birds seen in mottled, molting plumage in late July.

Movements. April–May influx, most leave before August, not fitting schedules given by Lewis & Pomeroy (1989) and Zimmerman *et al.* (1996).

Behavior. Chasing interactions in May–June often draw attacks by Lilac-breasted Rollers and African Drongos. In one three-bird chase, third bird was F, calling; F then watched two MM chase (despite attacks by a roller and three drongos). A circular, soaring display flight was noted 3 June 1990. On 28 April 1997 at CS a likely F uttered a bubbly, rapid piping series, repeated three times, the flying cuckoo landing with tail held upward floppily; the tail was lowered as it landed.

Voice. Well-known song, double-noted, sometimes with a honk-like second note; occasionally three-noted. Up close one can hear an initial “ook.” Contrary to del Hoyo *et al.* (2001: 402), four-noted songs are rare (see Borrow & Demey 2001: 487). Sings strictly in April–July. Other calls heard in chases, e.g., a rapid “koo-koo-koo-koo-koo” and a “koo-koo-koo-koo-kowk-koo” (then hit in flight by chasing African Paradise Monarch) by one chaser. Another M called “kook-ook-kook, ooo-kuk” in an aerial chase of a second M, then climbed frantically after the other bird in a tree, beating at it with its wings. Sings at night less often than congeners, but sings frequently at dawn and dusk. It also sings on the wing. Has a low “ooff-ooff” call as well. Calls poorly known, need comparison with framework of calls of Common Cuckoo (see, e.g., Cramp *et al.* 1985).

Breeding. No juveniles or definite breeding observations, but May–June chases and interactions, and often common singing and countersinging (in wetter years) April–July, clearly indicate that this is a breeding visitor. No specimens netted.

Barred Long-tailed Cuckoo *Cercococcyx montanus*

Months. April (once), May (once), July (twice), August (twice, one netted); probably a breeding visitor uncommonly April–August.

Notes. Seen in dense woods in a swamp in the NW 3 May 1994, heard at base of GMF hill 18 April 1994, otherwise heard 5 July 1991, 31 August 1992 and 18 July 1994 at NG. The record of singing away from Nglesha indicates that it is a visitor, not a resident. Its song is a series of double (“wee-a”), then triple (“wee-eee-cew,” “per-wa-wheew” or “tut-wee-a”) notes (see Fry *et al.* 1988); a trill also heard likely was from a F and thus has a chatter-trill like many cuckoos. It

is easily mimicked by a whistling human, and we stimulated it to respond to the whistles. Song recorded on tape 5 July 1991 at NG. Very difficult to see, in riverine forest and dense thickets of adjacent pastures; flies close to ground when in the open. Its singing suggests breeding in wet April–August. The adult netted 15 August 1990 weighed 67 g, the wings were 149 mm, and it was in fresh, non-molting plumage. It had brown eyes, yellow orbital skin, and yellow legs and feet. We culled several primaries, secondaries, and wing covert, breast, flank and rump feathers. The bird clearly was of the race *C. m. patulus*. Our records suggest that this is a regular (wet year) visitor, presumably for breeding (though none of its known hosts occur here, Fry *et al.* 1988). These authors, Lewis & Pomeroy (1989) and Zimmerman *et al.* (1996) regarded it as probably resident, and wanderer, vocal October–March, with nearest prior records from the S Nyandarua (Aberdare) Mountains and Mt. Kenya. Forests of the Nyandarua Mountains likely were connected to the Nglesha relict forest not long ago, and either this little-known cuckoo is represented by a small remnant population there, or it visits the area April–August. In either case the records are unusual and document its N-most occurrence in Kenya and in those months.

African Emerald Cuckoo *Chrysococcyx cupreus*

Months. April–August visitor or migrant in six of 14 years; six of 13 records in June.

Notes. Occurrences 27 April–17 August at six wooded sites during wetter years. Not observed consecutively at any site, and often seems to “sing its way” through the site, moving N, possibly heading for isolated mountains to the N (see Lewis & Pomeroy 1989, who consider it to be mainly resident, but is well-known as migrant in much of Africa, Fry *et al.* 1988, Borrow & Demey 2001). Usually heard before being seen; above dates cover singing period (only one of 13 was not singing, all records of MM or presumed MM). No definite indication of breeding (see van Someren 1956).

Klaas’s Cuckoo *Chrysococcyx klaas*

Months. Mainly May–July, three records April, 2 September, 2 January; breeding visitor.

Ecology. Likely breeding visitor in wet years, some may be migrants, in woodland edges, thickets, open bushland and wooded grassland, habitats very like those of the following cuckoo, which outnumbers it. Eats insects, including caterpillars; flycatches at times, and

also eats berries (*Euclea* sp.). Farther E, near Nanuyki, is more common than *C. caprius*.

Movements. Appears April–May, most gone by August; one singing in September, and a M seen 19 September. One sang at NG 8 January; an immature near Center 29 January 1997 may have been a late migrant, or a late result of local breeding tarrying in the area.

Behavior. Displays and chases observed in May–June. MM often semi-cock the tail, raise the crest and search for respondents to their singing. One at NG chased a Barred Long-tailed Cuckoo. A M 23 June 1995 displayed with tail up to a F in a bush; while she waited the M went to the ground three times for insect prey, then fed the F each time, with her tail raised, wings slightly spread and uttering chattering calls. The M also bobbed up and down with its tail partly cocked. See Fry *et al.* (1988) for other aspects of displays in courtship.

Voice. Distinctive song heard once in September, once in January, twice in April, and extensively in May–July. Mimicking of the song (a repeated “cha-wee-tsee” to “ta-weet-chit”) by humans whistling sometimes attracts the singer to approach, singing, and search for the “singer.” Van Someren (1956) gave other vocalizations.

Breeding. Likely, based upon chases, countersinging, displays and the one immature observed. Present in eight of 14 years, including five of the six years in which African Emerald Cuckoo also appeared, and much more apt to breed here than that cuckoo (e.g., heard singing on consecutive visits to some sites, whereas Emerald moves on). Reported hosts (Fry *et al.* 1988), warblers, sunbirds and others are well represented in the study area, hence food or other factors are responsible for its relatively low numbers. Common about Nanyuki, where Red-faced Sylvieta is one host.

Diederik/Didric Cuckoo *Chrysococcyx caprius*

Months. Mainly breeding visitor April–August or September; two December, four January, one February, one March records.

Ecology. Often common breeding visitor April–August, probably from nearby and stragglers may be present all years; numbers low in some years, not seen in 1986, and but one (6 December) record for 1988. Habitat varied, usually open, especially bushed grassland, forest and woodland edges, and gardens (well-watered Kuti and Center garden are “oases” in dry periods; one sang 30 January 1998 at Kuti, the only

song we have heard between mid-September and late March, and could be a resident at Kuti). Often seen flying or perched about open areas, forages in small acacias and flowering bushes and trees (for caterpillars). One F found caught in a golden-orb spider web at CS managed to escape after four-five min.

Movements. Generally enters the area in April to early May, although a few individuals may remain at favorable sites that have water year-round. Departs late July through August, only once present to 12 September (no records for October–November). Seen at NG 6 December and on the wall of Big Dam 3 December. Four January records; probably the same M that was at Kuti 30 January 1998 was there 9 February, and was singing there 30 March 1998.

Behavior. Aerial displays (Fry *et al.* 1988) of MM noted April–July, sometimes high over woodland. The chasing M may cock and fan its tail, and perch with wings out in between chases.

Voice. Usual song well known, and much like the similar but shorter call often uttered by Gabar Goshawk. Sometimes leaves out the final “dik” (“dee-dee-dee-dee”). Chasing M in M-M conflict may sing “pee-ew, pee-ew, pee-ew, PEEW, PEEW” or give loud, repeated “peeew” notes. A F in the hand called “zik-ik-ik-ik” and “tik-tik-tik,” notes similar to begging calls heard from juveniles. The display call of the F is a “dee-a,” in series, to “di-di,” twittery in sound.

Breeding. Juveniles seen 21 May–17 July, generally without host nearby (most independent, or nearly so); one begged from a M Red-headed Weaver 21 May 1990 at MK, and the same M weaver shortly after chased a M Diederik Cuckoo. M-F displays with the bobbing-bowing M courtship-feeding the F, more or less as described in Fry *et al.* (1988), were observed in May. The great bulk of songs is May–July, with a build-up in April and tapering off in August. Clearly this is a breeding visitor in the big rains, with little adjustment for July–August (September) rains, and none for the October–December little rains (only once in September, and one record of singing October–February). This seasonality is slightly later than the March–June breeding (we have only one observation for March) noted for this region by Brown & Britton (1980).

Specimen data. One M, three FF, one juvenile netted 1 June–4 August. A F taken 2 July had the tail half molted and new primaries through seven in the wing; none of the others were molting. The M weighed 33 g and had wing length of 113 mm; the three FF were 30, 35.5, and 36.75 g in weight and, respectively, had

wings at 107 and 110 mm, and were in molt. All juveniles seen, including the one netted, were of the rufous morph (Fry *et al.* 1988); these showed the white line behind the eye and above the ear coverts, not shown in some illustrations. In these rufous juveniles the earmark was decidedly brown, contrasting with the paler rusty crown-nape. Although a reddish bill was evident in juveniles seen in May–June, the 17 July independent juvenile had a dusky pink bill with the mandible more pink, and a pink gape; this juvenile had the eye gray with brown toward the pupil (these diverge from colors in Fry *et al.* 1988). The bill of the adult M was dusky black with the base of the mandible yellowish. FF generally showed more rufous and rusty brown in the tail, wings and on the head than depicted in standard works; the hindcrown and nape particularly are brownish. The three FF had yellow-brown eyes lacking any red tone.

White-browed Coucal *Centropus supercilarius*

Months. Resident.

Ecology. Resident in all edge, thicker, wooded and bushed grassland and bushland habitats, observed at all times of the year. Feeds in bushes, trees and on the ground, agile in chasing grasshoppers, running along roads, bounding through bushes and along rock faces like a ground cuckoo. Eats insects, nestling birds, frogs and fruits. May join mixed-species foraging flocks of babblers, bulbuls and bush-shrikes (*Tchagra* spp.). Suns in bushes or trees early in the day and after rains. Readily tame about camps, eating bits of sandwich and other human food items.

Movements. Sedentary.

Behavior: Sometimes mobbed or chased, e.g., by starlings, bulbuls and orioles. Sings with head bowed, throat quivering with each gurgling note. In conflicts batters opponent with wings, calling “tch-tch” harshly. Sings and calls before and after a rain.

Voice. Well known, gurgling “water-bottle” song, “coo” trilling call, and harsh rattling trill are the three commonly heard vocalizations. Also “tch-tch” notes aggressively.

Breeding. Mainly April–September, during and between the two rainy periods within those months; also to some extent November–January. Can breed taking advantage of heavy, out of season rains, as January–February 1998. Barred-plumaged, short-tailed juveniles have been seen May–September; a nest with three white eggs in a dense bush nearly on the ground in woods 26 May 1995. The nest had an entrance on the NE side at 16 cm up and was roughly a 32-cm

ball of twiglets, grass and straw. Duetting and chasing took place April–September, in December 1996, and in February 1998. Nocturnal singing well after dusk and before dawn occurred then as well. Thus the breeding regime combines the “Region D” breeding seasons of April–May and November–December with the additional rainy season peculiar to the region (July–September), and does not preclude breeding outside of these periods if conditions are favorable (see Brown & Britton 1980, Fry *et al.* 1988, del Hoyo *et al.* 1997).

Specimen data. Molting coucals were seen July–September, and those observed to January seemed in fresh plumage. One likely F netted 17 September 1989 weighed 162 g, with wing 150 mm and abraded tail over 195 mm; this coucal was in nearly fresh plumage, with tail fresh except for the central rectrix pair, and many incoming head feathers (wings and most of body fresh). The eye was “ruby red.”

TYTONIDAE Barn Owl, grass owl

Barn Owl *Tyto alba*

Months. Resident.

Notes. Uncommonly seen (past killing of owls sometimes by ranch security personnel in the mistaken idea that it, and all owls, kill domestic cats). Thus one was dead 1 October 1986 below a Hamerkop nest at LU; but in February 1997 a reasonably fresh pellet found beneath that nest suggested owls were still present. A Barn Owl was in a Hamerkop nest 27 May 1989 at NG. Not easily identified at night while driving, but one was seen 19 July 1990 W of Kuti. At GMF one flew over 4 June 1990 at 18:45, while still dusk, and one was flushed from a building there 13, 14 and 17 August 1997. Calling at GMF 05:27 h on 1 June 1995, when eight screaming “weeeeeee-aa” (distress call, Cramp *et al.* 1985) notes were heard. Likely resident in low numbers in riverine woods and about buildings where not molested (the shooting of owls stopped in 1990). Can breed in any month. The African Grass Owl *Tyto capensis* conceivably could occur, as it has been noted on the Laikipia Plateau at Mutara (Olson *et al.*, undated MS), but wet, extensive grassy areas are lacking for it in the study area.

STRIGIDAE Owls

African Scops Owl *Otus senegalensis*

Months. Uncommon resident and local wanderer.

Ecology. Widespread resident undetected much of the time, except by song. Known from along Mukutan

River and three sites along the Lugga Maji Nyoka, as well as at LU, PK, MB, and the GMF camp. The few seen well seemed to be of the gray phase.

Movements. Presumed resident, but often present at a site for one season, then absent for years.

Behavior. May have retracting territories, accounting for extending of two singers upslope to GMF camp at times, from wooded streambeds to the N and S. Songs heard most often November–February (over 60 times in nine seasons) during and after the little rains; less often sings April–August (about 20 times in eight seasons), and no songs were heard in 1987, 1988, and 1991. In January–February diurnal songs occasionally were heard; these were not heard in other months. Countersinging of two MM at GMF camp occurred only November–January. Thus is vocal when Palearctic Common Scops Owl *O. scops* might be present (Lewis & Pomeroy 1989).

Voice. Song a somewhat variable slow series of “kwop” or “kroo” notes, given at one to 11 times per min. Some variant songs are more like calls of F Common Scops (Cramp *et al.* 1985), a repeated “wee” or “kwee.” In December–February 1995 this owl sang on at least 26 nights at GMF.

Breeding. The behavioral data argue for breeding mainly November–February, and to a lesser degree April–September (Brown & Britton 1980 had no data, nor had Fry *et al.* 1988; del Hoyo *et al.* 1999 gave August–December).

White-faced Scops Owl *Otus leucotis*

Months. Presumably resident, generally rare.

Notes. Uncommon, occurs at 1750–1950 m (above altitude given by Zimmerman *et al.* 1996, del Hoyo *et al.* 1999, and Stevenson & Fanshawe 2001) at least sporadically in degraded acacia woodland and bushland from NP to Kuti, PK and below GMF. Only 15 records in January–February, August, October and December. A pair flushed from *Rhus* sp. tree, where roosting at PK 14 February 1991, left several feathers, including two primaries (pale brown gray, 13–15 darker bars, 13–14 cm long, verified as of this species), and two pellets of insect cases and finely broken bones beneath the tree, a regular roosting site. Sang December, January and August. A nest 1.8 m up a 2.7 m *Acacia gerrardii* was located 16 October 1997 below GMF camp, towards Kuti in open, degraded wooded grassland. Songs of the M at this nest were likely those heard at GMF during August 1997. The nest was an old Superb Starling, straw-twig “ball” nest; it had four white eggs within it – as too often is the case, our examination, careful though we were in not

using our hands on the tree and nest, probably resulted in baboons preying upon the eggs, and the nest was abandoned by 19 October. It thus breeds, at least occasionally, in the study area. It is known about lakes Bogoria and Baringo to the W (Hartley 1986). The date of the nest suggests that Brown and Britton's (1980) tentative September nesting was correct, with dry-period breeding after rains. Breeding site and date extend information in del Hoyo *et al.* (1999), who put this species in genus *Prilopsis*.

Spotted Eagle-owl *Bubo africanus*

Months. February, June, August, December; casual.
Notes. Only five definite records, though occurring at lakes Bogoria and Baringo (Hartley 1986); and one picked up dead 26 August 1990 on the Kinamba-Nyahururu road at Kiambari c. 10 k south of the study area. Two were flushed from swampy, dense forest thicket S of PK 17 June 1992; otherwise distinctive repeated notes "hoo-HOO" of its song were heard: 4 February 1988 to SE of GMF, 1 June 1995 in the same direction, 16 August 1990 upslope NW of GMF, and 13 December 1995 to the E of GMF. The calls were double-noted, the second deeper, but that could be the F note of a duet. Restricted, tall-tree, woodland habitat for Verreaux's Eagle-owls in the study area may limit opportunities for the smaller Spotted Eagle-owl, especially in riverine trees. Rocky Mukutan Gorge to the W of the study area may be source of the Spotted Eagle-owls seen and heard in the study area (see Lewis & Pomeroy 1989 and del Hoyo *et al.* 1999 for habitat preferences of these eagle-owls). The latter authors separated the N race *cine-rascens* as a full species; our owls seemed to represent *B. a. africanus*.

Verreaux's Eagle-owl *Bubo lacteus*

Months. All; fairly common resident.
Ecology. Hunts in all habitats at night, roosts in dense taller trees, even in low-topped woodland, as NP, where few tall acacias remain. Abundance affected by shooting of owls on the Ranch in the 1980s. Seen all over, even over grassland and at dams, where it drinks at times. Pairs seem to specialize on certain prey, e.g., on guineafowl *Numida meleagris* by the MK pair, hares *Lepus saxatilis* by the EG pair, and hedgehogs *Atelerix albiventris* by the SI pair; the majority of their prey items seem to be of these species. Other prey items include Egyptian Geese, Crested Francolins, and white-tailed mongoose *Ichneumia albicauda*. Peeled out, dried hedgehog skins mark areas under feeding trees; as many as seven may be found at one site. Dur-

ing the nesting period at MK, as one adult incubated, its mate leaped about on a road catching winged termites that were emerging. No movements.

Behavior. Often mobbed or chased in flight, as by two African Hawk-eagles clawing at one, and by Crowned Hornbills. Mobbing birds include starlings, drongos, helmetshrikes, orioles, rollers and flycatchers. One Tawny Eagle tried to take a hedgehog from an eagle-owl at a perch in Sipili, but was unsuccessful. Courtship displays of a pair at EG 19 July 1989 over 70 min included: leaning forward, foot-stamping, lowering of the wings, head forward and very fluffed (making throat appear white); most display by F, "puffed" M often faced away as F displayed. Also both faced one way, the M before the F on a branch, moving heads side-to-side, then the M turned and both bowed and stamped in unison. They uttered low "ooo-ooo-oo," "ooo-ooo," and "oop-oop-oo-poop" calls while displaying. These were repeated again and again (see Fry *et al.* 1988 for more on display).

Voice. Song heard in all months, but especially April–September and November–February; at GMF, calls heard (from afar), more in November–February than in April–August. Duetting was heard June–August and November–February. Young utter a call rendered "weee-ooo" at times. More often sang in early morning than at dusk (see Borrow & Demy 2001).

Breeding. Nests with eggs or young have been observed July–November, and recently fledged owls noted November–February and once in June. Breeding after the two likeliest rainy periods and during the interval between the second and third rainy season would seem to ensure post-rain prey being in large numbers. Courtship was noted in July. Nests were in old raptor nests, abandoned Hamerkop nests and old nests of Egyptian Geese that were probably prior raptor nests. Fights with geese for nests; one fought two geese for a Hamerkop nest 19 October 1992. Nests were in tree crotches, especially of *Acacia abyssinica* and *A. xanthophloea*, at three–10 m. One or two young may fledge, about equally often (*contra* Fry *et al.* 1988 and del Hoyo *et al.* 1999). Subadults have been noted with adults until July; at that stage calls still resemble those of fledglings.

Pearl-spotted Owlet *Glaucidium perlatum*

Months. Resident.

Ecology. Population variable, or opening up of habitats detrimental, as three times as many seen or heard 1984–1990 than in 1991–1999. Interactions with African Little Sparrowhawk, and abundance of Gabar Goshawk suggest that opening of habitat by burning

and overgrazing allows more competition and perhaps predation from other raptors. Favors wooded over bushed habitats; especially found in riverine timber. Usually eats insects, small birds, and mice; pellets show small, unidentified rats are a prey item, and one caught and ate a *c. 22 cm* agamid lizard.

Movements. None noted.

Behavior. Often mobbed by birds, especially bulbuls, warblers, white-eyes, cuckooshrikes, orioles, drongos, babblers, flycatchers, tits, starlings, serins, helmet-shrikes, puffbacks, sunbirds, petronias, Gray Woodpeckers and Scaly-throated Honeyguides.

Voice. Easily mimicked song, “weeew” series, given with and without the long-noted, screechy ending. Songs heard in all months but March; duets heard mainly January, and July–September. Simple whistled “oh-oh” series, call of courting F (Fry *et al.* 1988) heard in May. Nestlings give “pseee-eep” call, later as fledglings, more a “pseeee.”

Breeding. Nest with young December, preponderance of song indicates breeding in May–September with a secondary peak October–February. Courtship noted in May, duetting in July–September and January. Fledged juveniles from different nests seen in June, July, January (two broods) and February. Holes used for nesting-roosting were at 4–8 m; the nest was at 7 m in a dead, riverine *Acacia abyssinica* tree, and was an old woodpecker cavity previously used also by a group of Green Wood-hoopoes. The one record in September by Brown & Britton (1980) that involves this region agrees well with our observations (they cited Kenyan breeding also in February and July, both within the periods we suggest). Breeding times by del Hoyo *et al.* (1999) seem reflective of southern African bias.

Specimen data. A juvenile taken by hand in February, and one adult each from April, July, August and September give us a small sample. Weight: adults ($n = 4$) 81–111 g (89.7 g); wing ($n = 4$) 88–108 mm (100.5 mm), unsexed. The juvenile weighed 61.5 g and had wing at 101 mm. Molt was heavy in the April adult, and light (on the body only) in the September adult; otherwise the birds were not molting. The juvenile had a few spots visible on its crown, but when we lifted the feathers, streaks were quite visible. Small ear tufts also were evident (see Farmer 1984); the legs, were pink, and claws flesh-colored. These represent the race *G. p. licua* (Fry *et al.* 1988).

African Marsh Owl *Asio capensis*

Months. One August record, casual visitor from nearby grassy-marshy areas.

Notes. One perched on Center Dam wall before dark (18:45) on 15 August 1987, allowed close approach (dark eyes, dark-bordered facial disk readily noted, dusky on breast) and good view of large, buffy primary patch when it flew after several min. This apparently post-breeding record (Fry *et al.* 1988) suggests that it was a local, dispersing owl, possibly from more grassy and marshy areas farther E on the Laikipia Plateau (Zimmerman *et al.* 1996).

CAPRIMULGIDAE Nightjars

Montane Nightjar *Caprimulgus poliocephalus*

Months. All; likely partly resident, some may migrate out of area.

Ecology. After the Dusky Nightjar the next commonest nightjar. Singing territories much larger than in Dusky, habitat more of woodlands than that species, but they overlap. Less often on roads at dusk and dawn than is the Dusky Nightjar.

Movements. Not heard in extended dry periods during years with lower than average rainfall; in wetter years seen all year, and sings.

Behavior. Few data, may forage higher than Dusky Nightjar and be less often noticed. In the study area tends not to sing when Dusky Nightjars are singing steadily, although sometimes both can be heard at the same time.

Voice. Well-known song heard in all months, over the years. Song prevalent April–September (or parts thereof; in 1990 no songs heard from mid-June to the end of the year), and, in fewer years, also November–February. Occasionally sings partial song, or puts two or three songs together into continuous single utterance. Less often sings before dark and after dawn than does Dusky Nightjar. We reported (Horne & Short 1998) the appropriation of its song by a M Rufous-naped Lark that sang the nightjar’s song instead of its own. Cleere (1998) and Holyoak (2001) describe its song. *Breeding.* By voice, especially April–May, but on to September, with a sub-peak of singing in July; also (in 13 of 14 years) November–February. Two young at our Nanyuki property, in the SE Laikipia Plateau, hatched in early January 1998.

Specimen data. One adult M road kill picked up 12 November 1985 had testes 5 mm; it weighed 50.5 g, the wing was 146 mm.

Donaldson-Smith’s Nightjar *Caprimulgus donaldsoni*

Months. April–August, December; an irregular visitor. *Notes.* Known from Lake Baringo (Stevenson 1980, Zimmerman *et al.* 1996) and lowland N and E Kenya,

we have observed this well-marked, tiny nightjar in our study area some 12 times, and S. Sassoon (undated record) has reported seeing it there. Horne picked up a road kill near acacia crossing 6 December 1996 that verifies its occurrence in the study area. Most often observed in July (five-six records), but noted as early as 5 April 1994, and observed in above months, including December (to 20 December 1993). Several were observed in daylight hours; others were with Dusky Nightjars on the road, and seen for up to 5 min under lights of the car. Its size, small but conspicuous tail spots, white throat markings, and the often contrasting gray central rectrices against the rusty or dark outer tail are helpful in identification. The specimen was crushed, but four rectrices and both wings are in reasonably good condition, and the front of the head and throat are usefully preserved. The head, wings and tail are of this species, and the measurements are conclusive: wing 127 mm, tail 87 mm, bill 11.5 mm; these were checked against Jackson (2000a). We are uncertain of its sex. It proved intermediate between the rufous and gray-brown morphs (Cleere 1998, Holyoak 2001). The central rectrix is speckled gray with nine irregular and incomplete thin bars. We found it at 1800–1900 m in the study area, and note its occurrence to the SE in Quarter Square 50D of Lewis & Pomeroy (1989), almost all of which is above 1650 m; Fry *et al.* (1988) and Cleere (1998) gave 1700 m for its upper limit in Somalia. The breeding dates suggested as August–October in del Hoyo *et al.* (1999) indicate our records as pre- and post-breeding wandering.

Star-spotted Nightjar *Caprimulgus stellatus*

Months. April–July and September; presumably non-breeding visitor.

Ecology. Seen sporadically. Several seen (15 June 1990, 8, 9 July 1992) flycatching up from perch in the road, or scavenging at a road puddle, walking and hopping, entirely on the ground. Jackson (2000b) listed its foods. Sparse breeding data by Fry *et al.* (1988) and Holyoak (2001) indicate February breeding, so these presumably are non-breeding visitors from the N. The 15 or so records (some seen on consecutive days, as many as four times, such instances as these being combined as a single record) come from six years; July, with seven records, has the most occurrences. It is the size of the Dusky Nightjar, but is uniform in color, and its tail spots are smaller. Known to 2000 m (near NG) in the study area; Lewis and Pomeroy (1989) gave other records in N-central Kenya, and Lewis (1984)

cited records on the Laikipia Plateau at Colchecchio (at c. 1825 m) and El Karama Ranch (c. 1800 m).

Voice. Its distinctive song has not been heard.

Specimen data. A.M. Start picked up a dead F 4 September 1968, near NG; it had dark brown eyes, flesh-colored legs and feet and a horn-colored bill (Fry *et al.* 1988 gave dark brown color for eyes, bill, legs and feet, but see Holyoak 2001).

Freckled Nightjar *Caprimulgus tristigma*

Months. January, July, September, October; six records, rare resident.

Notes. This nightjar of rocky areas possibly moved into the study area c. 1990, following extensive burning in the 1980s; distinctive “barking” song heard SW of GMF, toward the Gorge of the Mukutan River, 8–10 January 1995; playback of its voice brought a dark M over us on 12 January 1995, but its only (aerial) response was a bark-like grunt. Song also heard briefly in GMF 9 September 1989, a barking “whup-(er)-whup” series. At 18:50 in the dusk at GMF 14 July 1992 a chunky, blackish gray M flew downslope from the W among five Montane (one) and Dusky (four) nightjars; the dark M, larger than the other nightjars, showed its white tail spots and small white wing marks (Zimmerman *et al.* 1996, Stevenson & Fanshawe 2001). This M or another flew downslope W to E over GMF 15 October 1992, and upslope to the W on the morning of 23 October at 05:50 h. A M also circled over GMF at 18:48 h (before dark) on 22 September 1997. We flushed three, a M, a F and a sub-adult with white in its incoming outer rectrices in a rocky area N of High Boma 19 July 1998; their finely buff-white spotted black-gray upperparts were seen well. It was listed by Hartley (1986) for the Baringo area; Brown & Britton (1980) had two breeding records for the region in May–June, Cleere (1998) gave May–June, and Lewis & Pomeroy (1989) mapped it as “breeding” E of our study area. Songs in January and September suggest more variable breeding seasonality than has been thought, although Brown & Britton (1980) noted September–November breeding in SW Kenya (see Holyoak 2001).

Dusky/Sombre Nightjar *Caprimulgus fraenatus*

Months. All months over the years, at least some likely resident.

Ecology. The commonest nightjar in the area. This nightjar is common in central Kenya, *contra* Holyoak (2001), occurring to Maralal and at our Nanyuki home, where it is less numerous than the Montane Nightjar (see Zimmerman *et al.* 1996, Stevenson &

Fanshawe 2001). Habitat bushland, degraded woodland-bushland, wooded and bushed grassland, and woodland edges; often on roads in such areas, also on dam walls. Display areas more bare, with low grass tussocks and scattered bushes and trees, rocks and pebbles, often beside little-used track; nests nearby. When displays occur, usually at dusk and just before dawn, the nightjars going off to feed at dark and to roost after morning displays. More crepuscular than Montane Nightjar, active earlier in evening, later (to 06:30 h on dark mornings) in mornings. Their habitats overlap, the Montane preferring more wooded habitat, but both forage over bushland and grassland. The Montane Nightjar sings over larger "territories," rarely are more than two MM heard at one site, whereas up to five Dusky Nightjars may sing about a display ground. Roosts near display grounds; F may fly at *c.* 15 cm above ground to the display area from a short distance away. Feeds on moths in headlights of cars; fast cars are responsible for many road-kills. At times, as about roads and display areas, feeds by flycatching upward for one insect, to *c.* 8 m up, then drops back to the ground. It drinks in flight from dams and ponds. Jackson (2000b) gave its foods.

Movements. Certainly moves locally, may move more extensively (see Lewis & Pomeroy 1989), but not proven to do so. Display-breeding areas may be deserted in dry periods. At GMF nightjars tend to move NE to S from the display sites, towards nearby valleys and streams where they forage. Some April and August concentrations about dams may represent "migrants," or resting or drinking nightjars.

Behavior. Foraging and displaying Dusky Nightjars are occasionally chased by Yellow-winged Bats *Lavia frons* and by African Drongos. Aggressive displays proffered to humans at times (for some years we held an evening "nightjar watch" on most nights from 18:35–19:05 h, standing silently, sometimes within a bush, at the local nightjar display area, and here MM particularly seemed to direct aggressive displays at us), including aggressive calls (see Voice); these involved fixed-wing glides at us, with vocalizations and calling in circular flight around us. Singing MM expand throat feathers, showing off the white throat patches as circular "beacons" fluffed on each side. M-F displays include circular gliding displays and sometimes a V-winged glide, the birds very close together and flying in tandem, with or without calls. The M fluffs its plumage, may land with wings vertically before the F and spreads and closes its tail. When following the F in flight the M may maintain a puffed throat; the

tail may be spread, and even "V"-ed, with the center drooping below the spread outer rectrices (showing off both wing and tail spots). At times the M flies "reining in," raising the head up and back, churning its wings, then gliding in a V-winged display; the wings may be twisted rapidly right and left, obviously "flashing" the spots. This may occur for 40 s, the M then landing beside the F. On the ground the M may walk to the F, wings and tail spread. Calls (see Voice) accompany most such displays. The white throat marks, white superciliary, rusty nape and white wing and tail spots become much more conspicuous in displays than when perched.

There are elaborate and varied M-M interactions involving both visual and acoustical displays. Chief among these is the V-parade, usually initiated by approach of a M to another, singing M, which flies up to join the first M, and they fly parallel to one another, wings up in a V, the tail also often in a shallow V, with vocalizations accompanying the flight. One M tends to "edge" the other M off to one side, holding the wings up but pushing into the other M. One M may perch in a tree near a singing M and they may engage in calling back and forth. Challenge calls (see Voice) often initiate the M-M interactions, following more distant countersinging, the MM singing 40–70 m apart. MM flare out the throat as they call, in the air or on the ground; the superciliary white stripe is erected along with the throat patches, indeed both areas may be erected and lowered time after time. MM facing off on the ground spread wings and tail, and "stand" on the tail, flailing the wings at one another; then both may spring into the air and go off in a chase, with stilted flight (glides, or V-parade flights). One M may make repeated chases, singing or calling briefly, then going out after the other M. A lone singing M when first hearing another M, or seeing it approach, will end its song with a "challenge call" (see Voice). These details considerably amplify knowledge of this "poorly known" (Holoak 2001: 573) nightjar. *Voice.* Churring song with fast tempo can be short in display situations (1–2 s) to long, up to 270 s or rarely longer (one 373 s song had two "breaks" of less than 0.5 each in it; many songs have such momentary pauses), although most are 70–200 s in duration. Songs have been heard in every month over 14 years, 92% of the songs heard at camp were in April–September, and nearly half were in April–May (48%). Singing commences earlier on average than in Montane Nightjars each year; the songs also commence earlier in the evening and last longer mornings. Dusky

Nightjars sing less often through the night than do Montane Nightjars. At GMF camp both nightjars sang on the same date (but mainly at different times) 38% of the time (data from evenings and predawn periods, not from middle of nights). Notes heard from undoubted FF, in the presence of, or displaying with MM were: a “typp” to “tchup” or “chuk,” singly or in short series, especially when about to fly, and a low “tchtchtchtch.” MM gave sometimes single but mainly double (or, close up, triple) notes, a “chuk” or more usually “tch-kook” (close up, “tch-whut-tle,” the “kook” notes sounding like a pony’s hooves clapping on cobblestones), mainly in series of three-12 double notes. These may be loud or soft, fast or slow (a “ty---koop”). This call is uttered in the display area, in the presence of other Dusky Nightjars (M or F) or not, usually preceding a churr song that may be short, or longer. Sometimes calls are given without songs, even for a full morning or evening session, especially in June. The “koop” or “kup” also is heard from MM about to fly. Some notes, and indeed the song, may be directed at the quiet, watching human observer. Another call is a “glug,” “gloog” or “tchkoongk,” usually in flight. We have heard short “pop-op-op” notes, and an aggressive “whrrrrrrr” or “dzeeeeeeeer-chaw” call, as well as a screeching note. Another aggressive call that might be termed the “challenge call,” associated with M-M interactions and display flights is a deep, hollow “kvroooauf” (or “kkrr-roouf,” or “vroooaum”) in series of two or three to eight notes. These may be appended to an often foreshortened song when a singer detects the presence of another M. Various calls and combinations of them occur with visual displays noted above. Hatchling Dusky Nightjars give reedy, piping notes audible for a couple of m only. Vocal data for this nightjar were sparse until now (Fry *et al.* 1988, del Hoyo *et al.* 1999); Holyoak (2001) was uncertain that it has a churring song, although Cleere (1998) noted that it has such.

Breeding. The main breeding season is April–September, with some breeding perhaps in December–February. This is based upon May–June nests, intense displays April–July, and to a lesser extent in February and August, singing in April–September, and December–February, and all-night singing in May–June. Eggs in the two nests that we found numbered two each and were pale buff to buffy white with pale lilac markings. Nests were depressions in bare ground with scattered stones and grass tussocks; one was in an elephant track. The two were on a slope in bushed

grassland. The nest found 1 May 1994 could not be followed; the young were gone by June. From this nest the F flew with wings upward, showing the spots, and the tail partly cocked with the undertail coverts erected; she landed nearby with tail still cocked and undertail “fluffed,” but gave no distraction display. The second nest on the same slope had two eggs 21 June 1994. On 25 June the F was absent and there were two young in the nest, each 3–4 cm long, sparsely covered with long, fluffy sandy-yellow down; the head was downy, the black back was bare, with down around it; their backs looked like stones. Their eyes were nearly closed, the bill small and soft with prominent nostrils, and the rictal bristles were soft. This seems to be the first description of this nightjar’s downy young (Holyoak 2001: 572). The hatchlings were gular-venting, so we quickly left them. There was no sign of the egg shells. On 26 June they were noticeably larger; the wings were long, the feet large. There was a hint of flight feathers along the rear of the wings. The youngsters hopped fast, using wings and feet, appearing like miniature ducklings. Their calls were noted above. Our failure to come upon more nests likely reflects our concentration on activities of honeyguides at wooded sites unsuitable for breeding of nightjars. These data considerably amplify in Fry *et al.* (1988), Cleere (1998), del Hoyo *et al.* (1999) and Holyoak (2001) information on breeding seasons and habits.

Specimen data. Many, often unidentifiable, crushed and partly eaten nightjars were found on roads about the study area. That we hit none in 14 years indicates that slow, careful driving avoids road casualties. Sexable road kills numbered four, two MM and two FF. Measurements of the two FF were 158 and 169 mm for wing, and 110 and 115 mm for tail. A F from 18 June had the ovary 12 x 6 mm, indicating breeding. A F of 9 July had begun molt of the outer rectrices and the inner 4 primaries were new. No MM were measurable.

Eurasian Nightjar *Caprimulgus europaeus*

Months. February, April; very likely underreported Palearctic visitor.

Notes. One specimen, decomposed but identifiable as a F of this species, was picked up near Center by manager C. Francombe 9 April 1985. We were able to identify a M low over camp for 5 min 19 April 1993, a F near five feeding Dusky Nightjars over camp 17 April 1996, and, near Center on the road 1 February 1995, a F; this could have been a boreal wintering F

(see Fry *et al.* 1988), or a very early migrant (leaves southern Africa as early as February, Harrison *et al.* 1997). The lack of wing markings in FF, the small wing spots (compared with Dusky Nightjar) in MM, the absence of a nape patch, grayer overall color and the longer, "leaner" look of this nightjar, given it by its long wings and tail render it quite different from the chunky, more strongly marked Dusky Nightjar (see plates in Zimmerman *et al.* 1996, Stevenson & Fanshawe 2001 and Holyoak 2001).

Slender-tailed Nightjar *Caprimulgus clarus*

Months. August, September, probably underreported.
Notes. Common to the W of the area about lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986), and occurring in places to 2000 m (Lewis & Pomeroy 1989), this nightjar may be underreported; FF are generally difficult to identify. Horne, with S. Sassoon, and A. and J. Start identified one in the central area on 2 September 1968. Horne picked up a F dead on the road at Posho Corner 15 August 1997. This had wing 144 mm, tail 107 mm, bill 12.5 mm; the gray-brown central rectrices were 12 mm longer than the other rectrices, and were very weakly and irregularly barred with eight fine bars. The outer rectrices were heavily brown and buff-rusty barred except for the 5-mm buffy white tip; the 4th rectrix had no apical patch (Jackson 2000a). These records are outside the reported breeding season in the region (Brown & Britton 1980, Fry *et al.* 1988). If the species is resident (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996, Cleere 1998), the records may be of dispersing birds. Its foods were reported by Jackson (2000b).

Pennant-winged Nightjar *Macrodipteryx vexillarius*

Notes. Reported, but not seen by us, and reports rather vague and outside the expected March–October period for this intra-African migrant, although the M, even without full pennants, is readily identifiable. There are records (Lewis & Pomeroy 1989) from within 8 km of the study area, to the W at Mukutani, near the mouth of the Mukutan River Gorge just W of the Olari Nyiro Ranch, and from Mugie, just NE of the Ranch, as well as from farther E and SE on the Laikipia Plateau, toward Nanyuki; hence we list it for the study area. Map of non-breeding range in del Hoyo *et al.* (1999: 381), and text, do not include W-central Kenyan occurrences; see Holyoak (2001) and Stevenson & Fanshawe (2001). The related Standard-winged Nightjar *M. longipennis* is known from nearby Lake Baringo (Stevenson 1980, Cleere 1998).

APODIDAE Swifts

Scarce Swift *Schoutedenapus myoptilus*

Months. May, July, August, September. Casual visitor.
Notes. Infrequently adequately observed, often with other swifts. Records are: 4 May 1993, three at Center, low over pasture; 6 July 1990 over MK with Nyanza Swifts; 28 July 1989 at NG; c. 12 on 17 August 1993 over PO; and four on 10 September 1988 at GMF with Horus Swifts. Observations in each case were sustained of this brown, chunky-bodied, pale-throated, deeply-fork-tailed swift. It probably is more common than we had noted (we have little time to check swifts overhead); known just S of us (Lewis & Pomeroy 1989).

African Palm Swift *Cypsiurus parvus*

Months. July, December; rare visitor.
Notes. Definitely seen: two taking flying termites over EG on 25 July 1988; one low over SI flying E 24 December 1988; and two flying back and forth over SI on 6 July 1996. Likely these tiny, streamlined swifts were wanderers from the N (Short *et al.* 1990); we know this swift well, and it occasionally visits localities to 2000 m from lower elevations (Britton 1980, Lewis & Pomeroy 1989). Its flight is distinctive, "busier," than that of the bulkier Scarce Swift that more often shows its forked tail.

African Black Swift *Apus barbatus*

Months. July, casual visitor, likely underreported.
Notes. Surprisingly rarely observed; we see it at Nyahururu Falls, to the S (with Nyanza and Scarce swifts), but c. 20 over NG 18 July 1991, circling with c. 20 Nyanza and four Mottled swifts, constitutes our only definite record of this pale-throated, dark swift, although likely more common than this indicates. It appeared bulkier, blacker and more distinctly white-throated than the Nyanza Swift. We often had to pass by swifts in front of storms, to get equipment under cover.

Nyanza Swift *Apus niansae*

Months. All but March, November; probably at least small numbers all months.
Ecology. Most often seen during stormy periods, although a few can be seen frequently about the Mukutan Gorge (Fig. 13), in which it may possibly breed. Only a dozen records October–April, mainly seen May–July. Occurs in small numbers to flocks of over 100, especially before storms, and when drinking at dams; on 20 July 1990 up to 35 per min passed WNW over GMF camp for 15–20 min, over 500 of

this swift, not including numbers of Little, White-rumped, and Mottled swifts with them. Also associates at times with Horus Swifts, Eurasian Swifts, and probably African Black Swifts. It is slightly smaller, browner, with obviously paler secondaries than the Eurasian and African Black swifts (see, e.g., Stevenson & Fanshawe 2001).

Movements. Presumably can reach the study area from nearby breeding sites in uplands to the S. The dearth of April records suggests that it may breed March–May outside the study area, then appear to forage after breeding.

Voice. Often heard “tzz-zeeeeeeee” or “er-eeeeeeee;” wings make a soft whirring sound, unlike the loud sounds of wings of the species of *Tachymarptis*.

Breeding. No evidence of such. Could breed in rocky gorge of the Mukutan River; often seen at sites about that river. Occurrence of numbers in June–July as late as 18:15–18:50 h suggests nearby breeding or roosting.

Eurasian/European Swift *Apus apus*

Months. April, May, September, October, December.
Notes. About 20 records (we work under trees and would not notice migrating, silent swifts, hence underreported), most in September. Boreal spring records are: 7 April 1993 over MB, 30 going E 29 April 1996, several feeding low over South Boma; and 8 May 1995, over 200 with scattered Nyanza (*c.* 20) and Horus (*c.* 15) swifts below them, foraging in swirling circles for 25 min, but gradually moving ENE along with *c.* 80 Barn Swallows and *c.* 15 Western House-martins, over PK. A dozen or so September records are from seven years, including one by Horne, Sassoon, Start, and Start 3 September 1968. Two S-moving small groups 19 October 1992 were associated with Western House-martins and Eurasian Bee-eaters. The December records were 18, 19 and 21 December 1996, about Big Dam, involving a foraging group of up to 70, in areas around that dam; several Alpine Swifts were with 20 of them drinking there on 19 December.

Little Swift *Apus affinis*

Months. June, July; casual visitor.

Notes. Undoubtedly underreported visitor from colonies in towns to the S. The White-rumped Swift is that found about buildings and cliffs, where it breeds; Little Swifts do not breed in the study area, nor in villages or hamlets that we have checked close by. Seen mainly over GMF with White-rumped and other swifts, where readily distinguished by its small size, square tail and white rump. Thus three to four among

White-rumped and Nyanza swifts over GMF 24 June 1991; one with White-rumped Swifts 24 June 1992; one among White-rumped swifts on 4 July 1995; a group of *c.* 60 in a mass, with Nyanza and White-rumped swifts all about, 5 July 1992; and *c.* eight among numbers of Nyanza and White-rumped swifts at 18:00 on 20 July 1990. Possibly these represent post-breeding dispersal, or wandering, although the flock of 5 July would seem to represent part of a colony from somewhere nearby (the entire group was moving about a storm front). Breeds in surrounding areas (Lewis & Pomeroy 1989), including Lake Baringo.

White-rumped Swift *Apus caffer*

Months. All except January; probably resident some years at Center, and in Mukutan Gorge.

Ecology. Likely most are breeding visitors late April–May to July or August; only 10 records September–March, four in April, seven in August, over 100 in May–July. Usually in small numbers, from pairs to *c.* 15, but up to 50 with the great storm-associated flocks of swifts and rarely to 150 (10 June 1992, after rain, over GMF); at times associates with various swallows and with migrating Eurasian Bee-eaters. Drinks from dams, often with other swifts.

Movements. Numbers seen only May–August, once *c.* 50 after an October rain; presumably moves in April–May from areas to the S and W (up Mukutan Gorge from Lake Baringo). December–March records of few birds about Center, where a pair or two could reside.

Behavior. Investigates any buildings, especially May–August. Slow-beating, “butterfly” flights have been noted of single bird coming to nest, or perched mate.

Voice. Adequately described in Fry *et al.* (1988) and Chantler & Driessens (1995).

Breeding. Active nests May–July, not all seen; flies deep into garages at Center, and stays inside for a long time. Pair interactions and displays also at this time. One nest in a cross-pipe, open at each end, within a shed. Uses old Red-rumped Swallow nests at Center and LA, latter at a rock face with overhanging rocks (e.g., entering and leaving 25 cm nest at 3.5 m in a corner below the overhang); at Sipili 4 July 1992 seemed to be trying to enter Mosque Swallow cavity-nest, one pair badgering the swallows. There are as many as four nests yearly at Center, and probably scattered nests at cliffs and rock faces in the vicinity of the Mukutan Gorge. Breeding is later than the March–May peak of Brown & Britton (1980), likely due to near certainty of July–August rains.

Specimen data. One came low enough to be netted at MB 13 May 1993. Weight 22.2 g, wing 138 mm; molt only about the eyes and traces on the body. Its forehead was brown-white; from the front the forehead was almost as white as the chin-throat (the white fringe of forehead feathers was noted by Fry *et al.* 1988, which can negate the “black forehead” stressed by Chantler & Driessens 1995).

Horus Swift *Apus horus*

Months. April–October; occasional visitor.

Notes. Not seen yearly, 31 records in nine years (of 14), most records May–July. Often high, thus overlooked. Most observations associated with storms, either before or after the rain. Seen in small numbers among other swifts (especially Nyanza, Mottled, and White-rumped), and Barn and Red-rumped swallows. Occasionally 15–20 noted, rarely up to 50 when swifts may number in the hundreds, involving up to five species. Forages high to low singly, less often in pairs or trios that seem to remain associated throughout the foraging period. Even when feeding high, usually drops to near ground level at times. Unlikely to nest in the study area, as terrestrial cavity-nesting birds whose holes they use are not numerous here.

Mottled Swift *Tachymarptis aequatorialis*

Months. January, March, May–September, November–December; regular visitor.

Notes. Mainly a May–September visitor, usually in small numbers, occasionally to 40 or so; also six records November–January in four years, and a single March record. Observed in all years except 1988. Often associated with storms, but sometimes appears in clear weather, perhaps attracted to the many dams, where it may drink. This and following swift presumably come from highlands to S and SE (Lewis & Pomeroy 1989). Sometimes with other swifts, especially Nyanza Swifts; forages, to within 1 m of the ground. Attention called to it by its tail (Fry *et al.* 1988, Chantler & Driessens 1995), or wing sounds, a “whoosh-woo-woop,” that calls to mind an approaching motorboat. We have c. 60 records May–September, over half in July–August. Rather easily identified when flying low and often makes repeated back and forth flights, paying little or no attention to the human observer.

Alpine Swift *Tachymarptis melba*

Months. December–February, June–July, September; casual visitor in small numbers.

Notes. C. 25 records, over half in June–July, often with Nyanza, Mottled, Horus, and White-rumped swifts, drinking, and storm-cloud associated. The single Sep-

tember and December records were in 1995, and the five records January–February were all during 1997. The December–February records possibly represent Eurasian birds; see Zimmermann *et al.* (1996) and Stevenson & Fanshawe (2001). Only occasionally flies as low as Mottled Swift, and then about dams, where drinking. At close range, wings (Cramp *et al.* 1985) produce a “zzzzz” or “zzzh” sound. Presumably reaches the area from mountain breeding areas to S and W (Lewis & Pomeroy 1989).

COLIIDAE Mousebirds/Colies

Blue-naped Mousebird/Coly *Urocolius macrourus*

Months. Resident.

Ecology. Apt to be found any place in the study area; usually not in thick woodlands, but overflies such, and in dry periods feeds in them. More numerous than the following species, and more widespread, but occurs with it about many sites, especially in the S part of the area. Feeds upon berries and other fruits, including those of *Euclaea* spp., *Carissa edulis*, and Australian pepper trees. Drinks at streams and probably at dams. One fed with finches on salt at an old salt lick (surrounded by barren earth, no grass, or even stones). Occurs in groups of five-eight. The well-known calls serve to keep the group together. Occurs at sites to 2000 m here and elsewhere on the Laikipia Plateau.

Breeding. Brown & Britton (1980) indicated breeding for the region during or after the big rains (April–May) and little rains (October–November), but with some breeding in most months. We suspect breeding is generally after the April–May, July–August, or October–November rains, depending upon their amounts and distribution, i.e., they breed during fruiting periods. Our evidence is meager, representing an immature handled in February, immatures observed July and August, and apparent “singing” (see Fry *et al.* 1988) in May, June, and September.

Specimen data. Three adults weighing 48, 51, and 52 g, and an immature (no blue nape, dully colored bill), 40 g, were netted at Center 11 February 1985; their coloration was as noted in Fry *et al.* (1988), and del Hoyo *et al.* (2001) for *U. m. pulcher*.

Speckled Mousebird/Coly *Colius striatus*

Months. Resident.

Ecology. Less common than the last species and more restricted to taller, denser vegetation, but sympatric regularly at Kuti, Center and Nglesha Center, CS, LU, PO, and KS. Usually not in bushland and in de-

graded acacia woodland. Occasionally reaches N sites (TA, FS, OD), and only sporadically occurs at some central sites such as MK, EG, LA (not at PK, MB, GMF, and UL). Largest groups, to 14, noted at NG. Among foods are fruits of *Rhus* sp., *Carissa edulis*, and cholla cactus *Cylindropuntia* sp. Del Hoyo *et al.* (2001) treated its foods. Drinks at streams, dust-bathes in roads. One group visiting MK foraged inside the honeyguide feeder, eating either beeswax or insects. May disperse along watercourses during good breeding years, and retreat to or remain only at favored sites in dry years.

Movements. Probably only disperses, as noted above; usually absent from most sites.

Behavior. Well known. It is aggressive, being helped by its social habits (members of groups regularly forage close to one another, much more so than in Blue-naped Mousebird); they can readily supplant honeyguides and such birds as Tullberg's Woodpecker. No interactions with Blue-naped Mousebirds were noted, although we saw both at some sites.

Breeding. No information concerning its breeding and its seasonality; in our area it may nest at any time (Brown & Britton 1980). Breeding is indicated throughout our area by Lewis & Pomeroy (1989). Its soft vocalizations and penchant for foraging within tree or bush foliage render it inconspicuous. A nest at Nanyuki was active May-June, the eggs laid in May.

Specimen data. Only one netted at NG 18 December 1994, weighing 50 g, with wing 92 mm. Only its tail was in molt. Its gape was blackish pink. Bill above black along the sides, silver along the culmen and about the base; below horn-colored; eye brown (race *kikuyuensis*, Fry *et al.* 1988, del Hoyo *et al.* 2001).

TROGONIDAE Trogons

Narina's Trogon *Apaloderma narina*

Months. Sparse resident; not recorded March, August.

Ecology. Found at well-wooded sites, especially NG, PO, LU, and in the gorge of the Mukutan River; also more or less regular at MB, OD and UL, and occasionally at MK and EG. Lacking in apparently suitable woods at SI and KS. Probably suffers in dry years, may later disperse back to central sites from NG and Mukutan Gorge. Sometimes forages within 1 m of ground, going to ground in flycatching from a low perch. Two-three pairs at OD and NG.

Voice. Well-characterized in various works; mimicked song by D. Chepus used to elicit songs (which it does

very effectively), and used, e.g., at MB to determine if present. F occasionally calls "coo" as M sings nearby, is less silent than Fry *et al.* (1988) described.

Breeding. Fledgling in June, nestlings in July, sings especially April-July (to a lesser extent November-January); thus breeds April-July and possibly November-January in some years. These data support seasonality of breeding given by Brown & Britton (1980). The one nest was 4 m up in an *Olea europaea* and likely was an old woodpecker cavity. The begging nestlings inside were well feathered, and came to the entrance, where fed insects (as green caterpillars) at long intervals by the parents.

Specimen data. Seven adults netted in April, May, June, and July, and a fledgling seen within 2 m. Adult weights and measurements were very uniform: weights of seven, 63-70 g, wing of five, 126-129 mm. Only the two adults taken in July were in molt (primaries new, to P6 and P7, tail at R3, body and head molt). Soft-part colors: M bill pale horn to yellow, tomtia yellow to orange, pale blue at base of bill and becoming greenish yellow on the bare skin of the fore-malar; gape pink; supra-orbital skin pale blue, under eye yellow to yellow-green; gular skin yellow; the April M had a cloacal protuberance. The FF have muted colors: bill dull green-yellow; facial skin patches bluer, less yellow and green; gape bluish pink; gular skin dull flesh-colored. The 30 June 1994 fledgling differs from those illustrated (Fry *et al.* 1988, Zimmerman *et al.* 1996) in showing slight green on the breast, and some yellow-white spots on the back (this bird had the tail "bobbed," was being fed by both parents, and could floppily fly only *c.* 5-8 m). The trogons were of the nominate race (see above citations; *arcanum* Clancey of del Hoyo *et al.* 2001 is not recognized).

ALCEDINIDAE Kingfishers

Brown-hooded Kingfisher *Halcyon albiventris*

Months. August, September, three records, all about Mukutan River.

Notes. Records are 25 and 28 August 1986 of a subadult at MK, 23 August 1993 of a subadult in the LA near MK, and 12, 17 and 20 September 1989 of a near adult (call not that of a fully adult Brown-hooded Kingfisher) about the EG. These kingfishers fed away from water, dropping to the ground for insects as van Someren (1956) described. The first two subadults had dusky over the culmen and at the tip of the bill, and the usual white collar of adults was obscured by dull streaking. The adult netted 20 Sep-

tember in a hail storm could not be measured and weighed (there were other birds, including honeyguides, in nets) it had a dull white collar, red bill with a dusky tip, rusty buff below, and some back molt. The nails of the orange toes of this last bird were horn-colored. The adult fed over small pools about, in low bushes under large trees, and up the slopes into leleshwa bushland. These presumably were post-breeding wanderers (Brown & Britton 1980, Fry *et al.* 1988, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996), of the race *prentisgrayi*, and were just below the 1800 m maximum attitude given for the species by Fry *et al.* (1992), although del Hoyo *et al.* (2001) have it occasionally above that level.

Gray-headed/Chestnut-bellied Kingfisher *Halcyon leucocephala*

Months. January, July–December; possibly casual breeding visitor.

Notes. Eleven records in eight different years, also seen in the study area by S. Sassoon. Sites were near NG, LU, MK, and MB; an adult was also seen near Kinamba, S of the study area 31 January 1999. Observed both near water at dams and the Mukutan River, and in woods away from water. One took a green lizard, dropping on it from above. Another dove six or seven times into the Mukutan River, splash-bathing itself, rather than feeding. Its trilling “song” (Fry *et al.* 1988, 1992) was heard October–January at LU, where on 3 October 1986 we found an adult beside an old woodpecker cavity 6 m up an *Acacia abyssinica* dead stub, below a 9-m bank of a dry Mukutan River channel. Work elsewhere prevented us from returning to the site, so we are uncertain of its nesting but note that six of the 11 sightings were at LU, the only site at which it sang. A molting subadult had streaking in blue on the rump, fine breast barring, a strong, dusky eyeline, and ventral rufous on the undertail coverts and in a mark on either flank; its bill was fully orange, but the tip of the bill was blunt and appeared to have been damaged, or broken; it weighed 48 g, and was netted at MK 19 October 1987. On 12 November 1985 we netted an adult at MK; it had a red bill, white chin and band across the breast and rufous-chestnut from lower breast to undertail, weighed 49 g and had wing length at 100 mm. The two netted, and indeed the adults we observed, all appeared to represent the dark-bellied nominate race; almost all were outside the April–September dates when *H. l. pallidiventris* could be expected (Stevenson & Fanshawe 2001). The possible breeding record

fits in with the breeding period given by Brown & Britton (1980); it breeds all about the region (Lewis & Pomeroy 1989), and we wonder at its sparse occurrence. About half the feeding efforts were over and into water, but the MB site had no flowing water, and the individual near Nglesha Dam 4 January 1997 foraged from fence to ground in open bushland 100–300 m from the dam.

Striped Kingfisher *Halcyon chelicuti*

Months. February, June, July, September, only four records.

Notes. Seen 2 September 1986 in a low dead stub along a road near MB, one observed after hearing it call in the steep ravine at PK 28 July 1987, and several duets heard in the lugga at PK 12 February 1988. Also likely one adult, at MB 16, 17, 30 June and 5 July 1992; it sang on three of those four days. We are uncertain as to why it is not more common, as it is found to the W of the area about lakes Baringo and Bogoria (Hartley 1986), and on the Laikipia Plateau about us to the E (Olson *et al.*, undated MS, and Lewis & Pomeroy 1989), and is mainly resident, although not about Lake Baringo (Stevenson 1980). Its voice is loud and distinctive, and we are unlikely to have missed its familiar call.

African Pygmy Kingfisher *Ceyx pictus*

Months. June, August, two records.

Notes. The two records of this vagrant (Fry *et al.* 1988, 1992; Lewis & Pomeroy 1989) from the W are adults of *C. p. pictus* (only white in the mark below and behind eye), from a streambed with dense undergrowth and trees at NG, and from dense but dry lugga vegetation at MB. The NG bird of 23 June 1992 weighed 10.5 g, and was in nearly fresh plumage with moderate body molt and two outer rectrices and two outer primaries yet to be molted. The MB kingfisher weighed 10.75 g, showed no molt, with wing 51 mm, and differed from the first one only in having *c.* 8 mm of dusky in a fine line on the culmen to the tip of the orange bill (possibly subadult). Both showed black in the lores and a fine black fore-malar line, as illustrated in Zimmerman *et al.* (1996), barely hinted at by Fry *et al.* (1988), but lacking in illustrations of del Hoyo *et al.* (2001) and Stevenson & Fanshawe (2001). The gape was orange, as were legs, feet and claws. The two sites are at 1850–2000 m. These records support the casual E (or W from Tana River region) wandering of W Kenyan individuals (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996).

Malachite Kingfisher Alcedo cristata

Months. January, February, May, July–October, casual; nine records in six years.

Notes. Two January and May records, one only in the other months, at MK, the acacia crossing (Fig. 3) and Center Dam. Seen feeding on introduced “Louisiana” crayfish *Gammarus* sp. in the Mukutan River. One dusky-faced and dusky-breasted, black-billed juvenile seen 21 September 1986 at MK; and a subadult still with a half-black bill noted at acacia crossing 2 August 1989, suggest earlier breeding (big rains, Brown & Britton 1980). An adult eating crayfish 2 January 1986 at MK was netted the next day; it weighed 16.5 g and had a wing of 58 mm, with no sign of molt. In hand it swung its head side-to-side and erected and closed its crest feathers. It later plunge-bathed in the river, and took another crayfish. Resident to W at Lake Baringo (Stevenson 1980), and occurs to our E (Lewis & Pomeroy 1989, Schulz & Powys 1998).

Half-collared Kingfisher Alcedo semitorquata

Months. July, possibly September; one valid record.

Notes. The black bill, buffy cinnamon underparts, barred, crestless blue head, blue sides of breast and rump and greeny blue general color of wings and upperparts, with its near Striped Kingfisher size, made the kingfisher seen for c. 5 min at acacia crossing 22 July 1989 easily identifiable as this species, well known to Horne from 10 years of experience in S Tanzania. Likely another was glimpsed at the Mukutan River 19 September 1986, but was seen only in flight, so we hesitate to “count” it. All were larger than Malachite and pygmy kingfishers. There are other reports from central Kenya (Naivasha, Lake Nakuru, Archer’s Post; Lewis & Pomeroy 1989, del Hoyo *et al.* 2001), and it does occur in highlands, but this was an unexpected observation.

Giant Kingfisher Megaceryle maxima

Months. Resident in low numbers.

Ecology. Likely one or two pairs in the study area along the Mukutan River, from Ol ari Nyiro Springs and, at times, the Okisim Lugga to MB and Titus Dam, although not regularly at MK site after 1993; at times, as in 1996, about the Big Dam and its wall, and about Lugwagippe Dam. These sites are along the Mukutan River, which has a population of introduced “Louisiana” crayfish regularly eaten by Giant (and other) Kingfishers. Usually hunts from a perch; hovers at times, from a height much greater than the usual hovering height of Pied Kingfishers. Does not use

dams as regularly as does the Pied Kingfisher; seen only near or at Titus, Big, Center and Lugwagippe among dams in the study area.

Movements. No migration, but may fly to 5 km from territory to a feeding site, e.g., from Mukutan River up Okisim Lugga to Titus Dam and back.

Behavior. Well-known as “shy.” One attacked at fishing perch by Scaly-throated Honeyguide gave up its perch, with a few “kak” calls, to the honeyguide. On 10 May 1985 we saw aerial displays of a M at MK; it flew in high circles over the river, rolled over three or four times in each circle, then fluttered down to the river calling “kek-kek,” also dove, snipe-like, from high up, to the river, the wings apparently making a whistling sound. This was near where they have nested, and the F was present along the river below the M. Displays virtually unknown (Fry *et al.* 1992, del Hoyo *et al.* 2001).

Voice. Slow to fast “kek” or “kak” calls, often a “cackling-rattle” as slow notes give way to rapidly delivered ones; this can be very *Accipiter*-like. An example with shifts in tempo was: “kyuk, kyu, ke-ke-ke-ke, kowp-ke-ke-ke-ke-ke-ke-ke-ke-ke.” Also a “chik-ta-kik” low series by MF together near nest. Fry *et al.* (1992) and del Hoyo *et al.* (2001) gave other calls.

Breeding. Difficult to ascertain nest contents, but active at nests May–August, food carried into nests in June, July; simultaneous calling of MF, frequency of calls generally, chases, displays, nests, and October juveniles indicate breeding May–September (del Hoyo *et al.* 2001 had May–October), and likely in some years also November–January. Nests seen only along Mukutan near MK (1985, 1990–1992), but likely nests occasionally at Big Dam (nest in dam wall) and possibly Lugwagippe Dam. Nest holes in steep bank, with rocky outcrops, within 0.5 m of water (1991 nest flooded). We did not go to nests, but entrances seen were excavated upward, such that entering adults flew upward into the nests. Three were within 20 m of river bank in three consecutive years. A juvenal F was seen at Lugwagippe 3 October 1986, and a F fished near a juvenile, probably a M, at the Mukutan River 2 October 1987. Numbers down, no breeding noted since lodge was constructed near the Gorge, and road along river became more used in early 1990s.

Specimen data. Usually flies through nets (some 10 times)! We secured the MK site M 15 November 1985, and the F 2 February 1986. Both were in full plumage with no molt. The M weighed 335 g, and had a wing of 195 mm; the F weighed 322 g, with

wing 197 mm. We lacked large bands when handling the M; the F was banded with East Africa Natural History Society band C-5061. We did not likely see the same M there on 11 February 1986, but it seemed so stressed by the netting and its removal that we released it immediately – it perched close by us for 58 min before it finally flew.

Pied Kingfisher *Ceryle rudis*

Months. All months; resident permanently at least at Big and Lugwagippe dams.

Ecology. Resident about two dams, wanders to streams and other dams at times. Seen all year and known to breed at Big and Lugwagippe dams, likely breeds occasionally near Center Dam and Nglesha Dam. Seen irregularly at Titus and Dirty dams, and sporadically along the Mukutan River, at acacia crossing, and at Nglesha crossing; likely also at other dams, as Education Center Dam where seen once. Hovers regularly, but more often hunts from a perch over or beside water. Eats fishes, “Louisiana” crayfishes *Gammarus* sp. and frogs of several species. One with a fish over half its size beat and mandibulated it for 7 min before swallowing it head first; the tail of the fish protruded from the kingfisher’s bill for another min before the fish was “swallowed.” Even a frog may take four to five min to ready for swallowing. Also hunts termites; seen pulling termites at intervals from an earthen bank too low for nesting cavities. May forage from a perch located within 3 m of a fish-eagle at times. One hunted along the Mukutan River for at least five hours then flew up in a circle, gathered height, and flew off to the E at considerable height. Diet more versatile than noted by some (Barrow & Demey 2001: 520, “feeds almost exclusively on fish”).

Movements. Moves locally to various dams; uses Mukutan River as a pathway about the area. None seen in late 1984 and early 1985, following a severe drought; may desert the area, at least for a considerable period of time.

Behavior. Supplanted by a Great Cormorant when perched close to the latter’s nest. Displays not seen described include a M calling as it hovered near a perched F; the M then went down to the water and waved its wings, almost “walking on water” as the F hovered above him for *c.* 10 s; both then flew to a perch and “duetted” (see Cramp *et al.* 1985, Fry *et al.* 1992).

Voice. Young call from the nest with a “sweet” to “tyi” series of notes. Other calls have been well-described (Fry *et al.* 1988, 1992), but nestling calls noted here

do not match those of Cramp *et al.* (1985), Douthwaite (1978:5) or del Hoyo *et al.* (2001).

Breeding. Nests with young June–July, excavating May–August, displays in May–July and December, calling together of a pair in June–July and December–January and courtship feeding (which precedes nest excavation by up to three weeks, Fry *et al.* 1992) in December indicate a May–August primary breeding season, with a secondary period of December–February, perhaps only in some years. Nests were from 0.35 to 2 m above the ground or water and may be flooded out by severe rains that wear away the banks or flood streambeds (those flowing into dams) to nest level or higher. A nest discovered 5 July 1993 fledged three young on 21 July. We found no evidence of helpers; trios observed were engaged in chases or otherwise seemed not to involve a helper, hence not always “highly social” (Stevenson & Fanshawe 2001: 222, Tarboton 2001 had it nesting mainly as solitary pairs in southern Africa). Doubtless the area is suboptimal for them, or there would be more Pied Kingfishers about more of the dams in the area; even Big Dam, with 4–5 km of shoreline, usually supports only one pair. Degradation of habitat resulting in much soil erosion when rains are heavy has left dams silted and water unclear for weeks to months thereafter.

Specimen data. One M netted at Lugwagippe Dam (honeyguide net near water) 6 January 1988 weighed a low 65 g (below weights of all 284 MF given by Fry *et al.* 1988); the wing was 139 mm, although the outermost primary was yet to be molted and other primaries may not have been to full length (Cramp *et al.* 1985). It was completing its tail molt as well, and the body and head feathers were mostly new.

MEROPIDAE Bee-eaters

Little Bee-eater *Merops pusillus*

Months. All but March, September, few pairs probably resident; over 60 records.

Ecology. Mainly seen in more open areas; paddocks about Center and Nglesha, and bushed pastures near Main Gate are likely breeding areas, all being near water. Half the records are from around Center and near the Main Gate; the others are from 19 sites covering the full altitudinal range (to 2160 m) of the study area. Ten records of more than two individuals made August–December, except for four close together near Big Dam 23 June, and eight apparent adults around KS edge 19 April. Five dustbathed together near Center on 9 December. Five fed on in-

sects at flowers of *Carissa edulis* near PK 25 August 1993. A migrating flock of White-throated Bee-eaters foraged over two hawking Little Bee-eaters at Center 10 July.

Movements. The adults seen 19 April 1997 could have been passing through or moving into the area – we never saw them there at other times. Usually considered resident (Lewis & Pomeroy 1989), but see del Hoyo *et al.* (2001).

Breeding. Suggestive of breeding are: the occurrence of a pair about Center in most months; two molting adults with three immatures near PK 25 August 1993; a bird flying from near the ground in South Boma 5 July 1998 (rough ground, large mammals prevented check for nest); and the fact that eight of 10 records of more than a pair were from August–December, well after the big rains. No concentrations of it were noted, hence what pairs there are in the study area are well-scattered, perhaps numbering five to 10 pairs in reasonably wet years.

Specimen data. One netted at PK 1 February 1998 weighed 14 g, was in fresh plumage with wing 104 mm; it was of the race *M. p. cyanostictus* (see Fry 1984, Fry *et al.* 1988, 1992).

Cinnamon-chested Bee-eater *Merops oreobates*

Months. January, April–August, October; casual sometimes breeding visitor.

Notes. Some 16 records, seven in the Mukutan Valley (MK, above MK, Gorge), three at NG, two at LU, and the other four at four well-separated sites. The Mukutan records were all 1992–1994 and involved breeding, at least in 1992, when three pairs were in 1.4 km of the valley, and at least one pair had young. The nest found 12 May 1992 contained at least two young (being fed white butterflies by the parents) on 2 June; by 6 July the two known holes were vacant and undamaged and the bee-eaters gone. This record is outside of those listed by Brown & Britton (1980) for the region (and del Hoyo *et al.* 2001 for all of E Africa), but likely their records reflected no area within that region that has three rainy seasons. Most other birds representing records were obviously moving through the sites where they were seen, and were not present for long enough to breed. None was seen near other bee-eaters, although we observed four species of bee-eaters, including this one, 16 April 1994. *Specimen data.* An adult netted at MK 22 April 1993 weighed 28 g, had the wing 103 mm and the gape yellow anteriorly and pale pink posteriorly; we noted no molt. The black subterminal mark on all rectrices

except the central ones was rectangular on each side, with the black narrower only on the outer rectrix (as illustrated in Fry *et al.* 1988, and not forming a V as shown in the flying adult by Fry *et al.* 1992).

White-throated Bee-eater *Merops albicollis*

Months. Mainly June–August; records all but December.

Notes. Variably present (as many as 40 records in 1989) or absent (1986; one each in 1988 and 1998), over two-thirds of the records in June–August with 91 in July alone. Flocks averaged 15–20; 40 and *c.* 80 were high numbers for months other than January and June–July, when we had totals at times of 500 or even 1000. “Records” reflect days when this bee-eater was seen, not the number of flocks in a day, nor the frequent occasions when flocks were seen at several sites in one day. Sites were all over the study area, including places above 2000 m in elevation. Most flocks were moderately high in the air, but at times they foraged low, or hawked from perches. Most January–March flocks were moving E to NE; June–August flocks predominantly flew W, especially from midday on; some flocks seemingly went E mornings and back W evenings. Rains forced some to descend; one such group of *c.* 100 13 August 1987 included within it two fully adult-plumaged Eurasian Bee-eaters. Sometimes foraged over cattle, and a cattle dip, and about bee-hives. They also feed about acacia flowers. There was no breeding in the area, but some of the June, July and (one) August flocks contained short-tailed, dull, greeny-plumaged immatures, suggesting earlier (February or March to May) breeding elsewhere. We saw July and August adults lacking, or with very short, tail streamers, thus in molt. Calls of this bee-eater, usually heard incessantly, are distinctly higher-pitched than those of Eurasian Bee-eaters, with more of an “eeee” sound (see Fry *et al.* 1988). Occurrence of this bee-eater in such numbers, more or less regularly, and at such high elevations (see Fry 1984, Fry *et al.* 1988, 1992) was unexpected, although del Hoyo *et al.* (2001) gave it as more or less resident near the equator.

Olive/Madagascar Bee-eater *Merops superciliosus*

Months. May–September, well over half of all records in May, migrant visitor.

Notes. Seen in nine years of 14, one–11 records yearly. May records were NW to SSE, with almost all N to NW records in 1994; directions of movements in July were NW to SSW (four records), and four September records with direction determinable were to the

E. Flocks were of three to over 300 (7 May 1995), flying high to low, the birds calling (“yapping” call) regularly. A flock of 50 downed by rain 15–16 May 1994 afforded close observation. Butterflies were a favored prey for hawking Olive Bee-eaters. Two scaly blue-green plumaged, nearly square-tailed immatures accompanied six or seven adults 15 September 1995. This “lowland” bee-eater moves about the W Laikipia Plateau at between 1700–1950 m (1500 m is its usually stated limit, see Lewis & Pomeroy 1989, Fry *et al.* 1992, but Stevenson & Fanshawe 2001 have it to 2300 m).

Eurasian Bee-eater *Merops apiaster*

Months. All but June–July; migrant and non-breeding visitor.

Notes. Three-quarters of records are for April, September and October; more often seen on boreal autumn migration than on boreal spring migration. In some years passes through quickly in September and April. The N-moving high flocks of early 1992 were observed only 28 January–3 February; but later that year S-moving flocks were noted September. In late 1994 leisurely S-moving flocks foraged and rested 15 November–13 December, but no earlier. Observed as late as 10 and 12 May during 1990 and 11 flocks on five days of May 1995; some of these flocks foraged low and perched, frequently calling (both “priet” calls and the distinctive, husky “kruup” calls, see Cramp *et al.* 1985). These May records are later than those usually given (Fry *et al.* 1988, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996). Stevenson & Fanshawe 2001 reported them in Kenya during May, and Harrison *et al.* (1997) showed that southern African migrants are still departing in late April and even early May, thus passing through E Africa still later. We also saw two adult Eurasian Bee-eaters perched and foraging in light rain among a large number of White-throated Bee-eaters N of Center 13 August 1987. Eurasian Bee-eaters usually do not reach Kenya until early September or later (Lewis & Pomeroy 1989), but reaches Zambia as early as late August, and Stevenson & Fanshawe (2001) gave July for early E Africa birds. Some obvious immatures were seen among September–November flocks that foraged low or perched (these immatures get their adult tail through molt on their boreal wintering grounds, and are duller than any, even eclipse-plumaged adults, Cramp *et al.* 1985). Numbers usually less in January–May, rarely reaching 50. In September–November individual flocks are mainly small, but they may pass over one after an-

other, say all morning, with totals to 500 and flocks as large as 60–70. From 10–22 October 1992 we counted 2130, and estimated 3000–5000 passed to the S over us. Accompanying the bee-eaters at times were Eurasian Swifts and hirundines.

CORACIIDAE Rollers

Rufous-crowned Roller *Coracias naevius*

Months. All months, fewest March–April; irregular visitor, also breeds.

Ecology. Sometimes common along roads and in degraded bushland and woodland, with low numbers in some years (none in 1984, very few in 1985, 1986 and 1989), nests at one to four sites most years, but not a regular breeder anywhere. Greatest numbers are May–July (also at times September, December–January). Seen feeding on grasshoppers and flying termites. Interacts with Lilac-breasted Roller, which is dominant (but that may reflect its territoriality for longer periods). Frequently seen in the Kuti-GMF-MB area, and favored sites are MB, PK, LU, EG, and UL.

Movements. Difficult to evaluate. Does not migrate in groups. Except at sites where it breeds, apt to stay in one area for a few days, or occasionally to four weeks. Lewis & Pomeroy (1989) noted yearly variation in numbers.

Behavior. Wobbling flight displays with and without rolling, showing off its blue (but appear white in light) wing marks (Fry *et al.* 1992). A pair at PK flew in a side-by-side parade about 6 m apart down and around the valley, the M wobbling about beside the F.

Voice. Its “kaw” or “kaa” calls are well known; during rolling these switch to “ek-aa, ek-aa” and at times to harsh of “ek-ek-ek” notes. In displays of a pair (see Behavior): “ka-kut, kyu, kyu-kyu, ka-ka-ka-ka, ka-kak-k-ka-ka, ek-ka” then “uk-uk-uk, tchi-kut, tchi-ku, chi-ka, chka, ti-u, ti-u, tu, t-u,” fast, as in a babbler chorus, from 3 May 1994.

Breeding. Pairs seen in most months, including February and December, and calling occurs April–September and November–February. Displaying, including calling in aerial displays, was noted in February and April–August. Immatures May–September, nests May–June, and copulations in June indicate a May–August breeding regime, with a potential for nesting December–February, and of commencing as early as February. Fry *et al.* (1988) gave February, March, May and November as breeding months for our region, but nesting seems to occur in the study area from late in

the big rains, through the subsequent drier period, and into the July–August rains. The nest at LU 1 June 1989 was in a broken-topped dead tree in dried mud back from the dam, at the *c.* 13-m-high break; the tree was 0.7 m thick. Adults were carrying insects, including dragonflies, to the nestlings inside. A second pair at the other end of the dam were seen copulating that same day. Other nests were in the wall of the lugga at PK and probably at Titus Dam, where a fledgling was hop-flying about trees 18 June 1989. An adult carried a grasshopper for over 300 m at NP 24 August 1997. A fledgling was following an adult at Titus Dam 17 May 1996. Another accompanied juvenile still begging was NW of MB 9 July 1992, and two adults moved closely with an immature at LU 12 September 1988. Independent immatures were about GMF through late May–early June 1996, about Saddle Boma 31 May 1996, and at the E border of the study area 7 September 1987; four apparent adults in fresh plumage, showing no aggression together in two trees at the E border 7 January 1987 may have been two subadults with their parents. Fresh-plumaged adults were observed August–January.

Eurasian/European Roller *Coracias garrulus*

Months. January, May, November–December; casual Palearctic migrant and boreal winter visitor.

Notes. Usually occurs below 1500 m (but up to 3000 m rarely, Lewis & Pomeroy 1989), and our five records seem to be wanderers; all are of one to three rollers. Reported by C. Francombe (*in litt.*) as seen rarely at NG (*c.* 2000 m) in early April, we have seen two at Sipili 24 December 1988, one at the area N of acacia crossing 31 January, and one at MK 28 January of different years, presumably boreal wintering casual wanderers. At High Boma three were present 14 November 1992. In a low bush N Center 30 May 1996 we saw an adult in apparently good plumage allowing approach to 7 m beside the road. Although known so far only until late April in Kenya, this roller occasionally leaves southern Africa as late as May (del Hoyo *et al.* 2001, and a few oversummer there, Harrison *et al.* 1997) and thus can be expected to occur in May in Kenya. Of course it could also have been a sick bird; in any case its features were those of a fresh-plumaged breeding adult (with grayish central rectrices and black primaries and secondaries, so not a streamerless Abyssinian Roller *C. abyssinicus*, which should be elsewhere breeding at that time). The Abyssinian Roller is a lowland NW Kenyan species that does wander into uplands, but we saw none.

Lilac-breasted Roller *Coracias caudatus*

Months. Resident in small numbers, common breeding visitor.

Ecology. Favors edges of woods, degraded woodland and bushland, pastures, wooded and bushed grassland, and edge of cultivation and gardens. Can be found about all sites and roadsides. Requires cavities in which to nest, thus is pugnacious, aggressive to other hole-nesters, especially Rufous-crowned and Broad-billed rollers, parrots, woodpeckers, starlings and hornbills. Rueppell's Long-tailed Starlings may perch near Lilac-breasted Rollers in the presence of small avian predators, such as Gabar Goshawks. Forages near mammals (cattle, zebras, elephants) at times. Usually hawks to the ground for insect prey; also takes snakes to at least 30 cm, and lizards. Hawks for flying termites, but also was seen to clamber about a dead tree like a turaco, capturing termites as they hit the tree. In favorable years paired birds remain together near the breeding sites, but they disperse in extended dry periods.

Movements. Many move out of the area in droughts, as in 1984, and in extended very dry periods, whereas in wet years with confluence of rainy periods pairs remain at breeding sites. Apparently does not “migrate” in flocks, but a group of seven seen on the slope of UL, and including two immatures, were moving through the area 14 November 1992. Hence is not strictly resident as books (e.g., del Hoyo *et al.* 2001, Stevenson & Fanshawe 2001) tend to indicate.

Behavior. Other than attacks on, and attacks by other hole-nesters, is itself “mobbed” occasionally (by helmetshrikes and drongos) and itself chases Egyptian Geese, Gabar Goshawks, African Little Sparrowhawks, African Goshawks, Augur Buzzards, chanting goshawks, African Cuckoos, and even Tawny Eagles. Also supplants terrestrial, insect-foraging starlings. The rolling display were well characterized by Fry *et al.* (1988, 1992), but other aspects of aerial displays are poorly known. Wobbling displays can accompany rolling, may be used after rolling (as the roller comes down), and on its own, without rolling. In this aerial display the body tilts or swings regularly or irregularly from side-to-side, sometimes as one roller circles another (likely paired birds). A zig-zag flight may accompany the wobbling. As it comes to its mate, the displaying roller may glide down with wings in a shallow V. Maclean (1993) mentioned the wobbling (not as such) in this roller, and Cramp *et al.* (1985) noted it in discussing rolling displays in the Eurasian Roller. Paired birds bow frequently, with wings flapping in

non-aerial displays. An incoming M from its rolling display may bow and the F respond with a bow commencing with "sky-pointing," the bill held up vertically and the tail cocked and spread; she does this before courtship-feeding. She may also erect crown and superciliary feathers. Wing-bashing and gaping mark M-M encounters following or preceding chases. We think that the M rolls and calls loudly in chasing, say geese, and small predators such as Gabar Goshawks, and at humans, as a demonstration before the F; both of a pair may indulge in this together, perhaps as a pair-maintenance activity (see Cramp *et al.* 1985 for Eurasian Roller).

Voice. Major calls of displaying, rolling birds as Fry *et al.* (1992) described them. F also gave "wik" note series with the M flying above her, and in courtship-feeding low "kek-kek" calls were heard. Nestlings utter a "tink-tink" series much like notes of the Three-banded Courser.

Breeding. Nests primarily in February–September, mostly April–July (25 nests), but can breed in any month, and occasionally does so October–January (e.g., 1988, 1992, and November 2001 in Nanyuki). Although this roller calls at any time of the year, rolling, wobbling and other displays were prevalent May–July and December–January. Copulation was seen May–August; nestlings and dependent fledglings were noted March–September, and November–January. Nests were at two–16 m in trees such as *Acacia xanthophloea*, *A. abyssinica*, *A. gerrardii*, *Combretum molle*, and *Olea europaea*, mainly in old woodpecker holes (some previously used for nesting by parrots, starlings and wood-hoopoes) but, in a few cases, in natural cavities caused by limb breakage and rot. The Brown Parrot may be an asset to the roller because entrances to many nests of the latter appear to have been enlarged from the original woodpecker's entrance, more easily allowing entry by the rollers.

Specimen data. A partly albino adult was at LU 1991–92, with one wing and its back splashed with all-white feathers. Two were netted in 1993. A F taken 8 April weighed 109 g, and had the wing at 164 mm; it was in fresh plumage. After releasing this roller, it joined its mate in attacks on starlings, and the M then fed her an insect (we had marked the F). Another taken 6 May weighed 115 g; it had an unusually abraded right wing at 151 mm, whereas the left wing measured 164 mm. The mouth of these rollers was pale yellow, and the eye light brown with a paler, buffy outer ring. Molt of the central rectrices was observed July–September (one in May), with wing molt noted

to November, and obviously freshly molted adults seen August–December. Those observed and examined were of the nominate race (Fry *et al.* 1988, 1992); no blue-throated *C. c. lorti* were seen.

Broad-billed Roller *Eurystomus glaucurus*

Months. January, April–October; irregular, sometimes breeding visitor.

Ecology. Records mainly 1986–1994 (none in 1985 and 1998, one each in 1995–1997) with one in January 1987. Forages mostly as swallows and nightjars, taking insects in the air, but sometimes hawks insects from a perch. Often crepuscular, and forages more on dull, overcast days than in sunlight. May perch within 1 m of ground, and inside foliage of bushes and trees, resting or in avoidance of conflicts with Lilac-breasted Rollers. It is faster, more agile in flight than is the latter. Mainly in edges of riverine woods.

Movements. Usually appeared May–August, rarely April, mostly in June. Stayed briefly in some years (1986, 1993), in other years for c. four months (July–October 1987, June–September 1989 and 1992, May–August 1990, April–July 1994). Groups were of four–11, mostly in June and August.

Behavior. Conspicuous on the wing, often perches quietly, hidden; attacks other hole-nesters when breeding, returns attacks by slower Lilac-breasted Rollers. Courtship involves flight display over the nesting site, and often involves three adults initially; hence there is much chasing and calling, with supplanting (Fry *et al.* 1988).

Voice. Well characterized by Fry *et al.* (1988, 1992) and Maclean (1993), but one interactive call heard 4 June 1990 as one supplanted another was a "prew-pee-yewp."

Breeding. Nested certainly in 1986 and 1994, both at EG and likely nested in 1989–1993, as suggested by pairs on territory, calls, and chases. Calling was heard June–September and likely occurred as early as March 1994. One nest was in a split open old woodpecker cavity at 3.5 m in an *Acacia xanthophloea* in early August 1986; the young fledged but adults must have led them away from EG right after fledging. A fledgling was with parents there 19 June 1994; nesting must have commenced in late April. In years when Broad-billed Rollers do come to breed, their seasonality differs from that stated by Brown & Britton (1980), Fry *et al.* (1988), and del Hoyo *et al.* (2001), being earlier, between the big rains and July–August rains, or centered on the latter. Perhaps they come to breed when rains are insufficient in other prospective

breeding locations. The virtual absence of records October–March indicates that it is not a resident in or near the study area.

Specimen data. Two unsexed adults were netted, 8 August 1986 in EG (probably one of the nesting pair there) and 13 July 1989 at MB. These respectively weighed 113 and 119 g, with wing length 176 and 173 mm; the August roller was not molting, and the July bird was completing molt of the primaries. Several molting adults were noted in August. The specimens were of the race *E. g. suabelicus* as determined by their lilac-tinted crown and neck and pale blue undertail coverts, as well as their measurements (Fry *et al.* 1988, del Hoyo *et al.* 2001).

PHOENICULIDAE Wood-hoopoes, scimitarbill

White-headed Wood-hoopoe *Phoeniculus bollei*

Months. All but February–March, November; local resident Nglesha.

Notes. At least two groups inhabit the forest remnant, surrounding woodland, riverine woods and thickets at 1900–2000 m about Nglesha (Fig. 15). On 24 April 1993 an African Fish-eagle stretching in an *Acacia abyssinica* S of the Lugwagippe Dam caused six of these wood-hoopoes to flush from that tree. This is the only record away from NG, at which this species was observed on 40% of our visits. It is known to occur NE of the study area about Maralal (Lewis & Pomeroy 1989), so its occurrence at NG is not totally unexpected. The LU record may indicate dispersal from hence successful breeding at NG. Seen frequently in *Acacia abyssinica* trees in which it probes under bark crevices; one fed in this way near two similarly feeding Scimitarbills. Calls vary from a “krikikrikik” to a “brrrrrrrrrrr,” as well as a “prdddt-dddeedeet” that leads into a chorus, or (from field notes) a chattering trill to a winding rattle, differing from harsher, lower calls of Green Wood-hoopoes, which occur sympatrically at NG and LU. Its flight is more airy and Scimitarbill-like than like that of the Green Wood-hoopoe. Apparently breeds during and following the big rains as we saw three adults with two juveniles 28 July 1989; an adult fed a cicada to a fledgling that took 2 min to swallow it. The juveniles were nearly as Fry *et al.* (1988) described immatures; the head was mottled gray, green, and white, the bill was mainly dark, and the legs were duller, more pink-red than those of the adults. Most of the observations followed our hearing of its distinctive calls. Comes to distress calls of netted birds. Voice tape-recorded.

Green Wood-hoopoe *Phoeniculus purpureus*

Months. Common resident.

Ecology. Common in groups averaging five individuals in all wooded parts of the study area. It ranges at times into bushland and wooded grassland, e.g., a group wandered through GMF in bushland perhaps every tenth day on average. Forages on bark of trees, including fallen limbs, sometimes on the ground (for termites); at times joins mixed-species foraging flocks, associating especially with White-crowned Helmet-shrikes and Brown Babblers, but also with hornbills, other babblers, and other birds. Mainly insectivorous, eats caterpillars including the large saturniid *Cirina forda*, waxworms in drying beeswax, grubs, and others; also eats lizards occasionally, and a group at Center feeds on hanging carcasses of cattle or game in the meat shed. Drinks from streams and water in tree crevices. Subject to predation by various mammals, snakes and raptorial birds; the bush squirrel *Paraxerus ochraceus* ate the eggs from a wood-hoopoe clutch. Du Plessis (1989) showed how important available roosting cavities are to this wood-hoopoe; burning and firewood-gathering practices are detrimental to it. Territories are defended in wooded areas where wood-hoopoes breed, but groups do not defend adjacent bushland where one, then another group may feed sporadically.

Movements. No large-scale movements, groups cross open areas to feed in lone grassland or pasture trees, and irregularly move into surrounding habitat of their breeding territories that is suboptimal for breeding, but may provide food. That it is not strictly resident is indicated by its irregular appearance *c.* seven times a year at our Nanyuki home.

Behavior. Well known (Fry *et al.* 1988), but from perhaps optimal habitats. Engages in sometimes frantic battles over prospective breeding cavities, particularly with glossy starlings, and to a lesser extent with rollers and various woodpeckers. Also has to deter the nest-parasitic F Greater Honeyguide from laying in its nest. Pursued by smaller avian predators, it may itself chase an African Little Sparrowhawk that harries a group member. Against the Gabar Goshawk the group may cluster together, flapping their whitemarked wings at it. We have seen displays and copulations, the latter lasting to 90 s (see Fry *et al.* 1988). Second broods are raised at most favorable sites such as EG, SI, MB, and LU (all with many dead or dying trees), and young of the previous brood will both feed the primary F, and beg food from other group members. After hatching some primary FF receive all incoming

food and the F herself feeds the nestlings (and herself), whereas in other cases the other group members assisting as helpers go into the nest to feed the young, and these include even the black-billed immatures of a prior brood.

Breeding. Nesting peak is May–July; overall nests March–September and, in a few years, December–February. Double broods occur some years, but we have no instances of triple-brooding among *c.* 47 nestings. Usually two, but one to three young fledged from the successful nestings. Nests at 2–10 m in various trees, frequently olive, which have many natural holes, some leading to cavities suitable for nesting (and many holes for roosting), and also *Acacia xanthophloea*, *A. abyssinica*, and *Euclea* sp. Greater Honeyguides parasitize some nests, as evidenced by the characteristic wood-hoopoe odor noted on *c.* eight immature Greater Honeyguides. In one nest with three bluish wood-hoopoe eggs and one rounder, white honeyguide egg, only one wood-hoopoe hatched; the other eggs disappeared. Most begging heard near the nest is of the primary F begging from incoming adults and subadults of the group, with her insistent “pee-pee-pee” calls. Fledged young are well cared for by all members of the group, and are incorporated into the group. The largest groups were of 10–11 birds, with say two immatures and another one or two subadults, but these were exceptional. Breeding seemed clearly related to the big rains–July–August rains usual regime, which in most years ensured insect foods, particularly caterpillars (Fry *et al.* 1988) for immatures during July–September.

Specimen data. We netted 12 adults and six immatures-subadults, all but one adult taken April–November. The 11 April–November adults weighed 64.5–81.5 g (71.1 g); the January adult weighed 94.5 g. The six subadults weighed 67–85 g (77.3 g). Of the 18 wood-hoopoes only two from May and November were essentially fresh, with but traces of molt. We were surprised to find wing molt in all months of April–July, as well as in September, November, and January. Thus wing measurements gave no significant information (four adults, 126–144 mm). We did not sex the netted birds by bill length; although MM have a longer, more curved bill (by 20% according to Fry *et al.* 1988), we noted considerable variation in FF of those authors’ sample of *P. p. marwitzi* such that the F range included that of most MM. The wood-hoopoes were of this subspecies, although several were more blue-violet, possibly tending toward *P. p. niloticus* (range given by Zimmerman *et al.* 1996 and Steven-

son & Fanshawe 2001 includes NW Kenya to lakes Baringo and Bogoria for *niloticus*, which was not even admitted into Kenya by Fry *et al.* 1988 and del Hoyo *et al.* 2001).

Scimitarbill/Common Scimitarbill *Rhinopomastus cyanomelas*

Months. Fairly common resident.

Ecology. Occurs in woodland, bushland, degraded, open woods, and edge; similar habitat and foraging to the Green Wood-hoopoe, perhaps more often in wooded grassland. Sometimes forages with mixed-species foraging flocks of warblers, flycatchers, tits and others, sometimes with Green Wood-hoopoes (but occasionally chased by the latter). Often forages in acacias, and seen in same habitat as the Abyssinian Scimitarbill, but less common than is the latter there. Flycatches for termites. Forages singly, or more often loosely in pairs or family groups of up to four. Territories at least as large as those of wood-hoopoe groups; pairs rarely meet, probably keep apart by songs.

Movements. None known, but numbers down in some years, as 1997.

Behavior. One pair suffered 7 min of sustained attacks by a M Black Cuckooshrike that the Scimitarbills had attacked. Pairs join in mobbing, e.g., Pearl-spotted Owlet. Sometimes responds to human whistled mimicry of its song by approach, “shreeee” calls, and bowing the head far down and tail upward. Also displays involve a vertical head-raising.

Voice. Song well-known series of *c.* four to nine whistled “pwa,” “waat,” “wecowt,” or “pewt” notes, easily mimicked, as by a human whistling slowly to his dog. A less loud, guttural “gwa-gwaak” while feeding may serve as a contact call. Also heard occasionally are: a cuckoo-like chatter “chukka-chukka-chukka” heard in M-F displays; chattering trilling or a few notes, “tik-tik” or “tik-et;” a “tk-tk-yow, kyow, kyow;” and the “shree” note mentioned above. Aggressively utters a long “skreeee” or “tzzeee-tzeee” call. These show differences from calls described in Fry *et al.* (1988), Maclean (1993) and Steyn (1999).

Breeding. Nests not found, but brown-faced, short-billed immatures (one or two) have been observed with parents May–July and December, following the big rains and little rains. Songs were heard every month but mostly April–September and November–February, with more heard May–July than in the other months. It is not a dry season breeder as meager data of Brown & Britton (1980) suggested; del Hoyo *et al.* (2001) gave only June for Kenya.

Specimen data. Only two adults and a subadult were netted. An adult of a pair with accompanying young weighed 32.5 g, but the press of netting prevented measuring its wings. An adult F (face brownish black) netted 5 November 1985 (MK) weighed 37 g, and had wings at 111 mm. A subadult feeding alone in EG 12 September 1987 weighed 26 g; it had brown on the face and throat, and a pale yellow gape, and was later seen on 15, 16 and 19 November, always alone. These represent *R. c. schalowi* (Fry *et al.* 1988, del Hoyo *et al.* 2001).

Abyssinian Scimitarbill *Rhinopomastus minor*

Months. May–September, November; very local resident.

Notes. Almost entirely observed in the flat, degraded, acacia woodland and bushland about Northern Plain Dam; one sang in the dry lugga of ML 4 September 1987, and none was seen there again, so does move (see del Hoyo *et al.* 2001). Seen usually in pairs, nine records, including a pair with two newly fledged young following adults closely as they foraged, mostly on branches and trunks of *Acacia gerrardii*. Thus breeds July- or August–September, during or at the end of this area's unique July–August rains (see Brown & Britton 1980). Distinctive song (see Fry *et al.* 1988) a “whee-whee” to “feew-feew” series. Reaches 1800–1900 m elevation here and presumably to the E (Olson *et al.*, undated MS, Mutara Ranch; see also Lewis & Pomeroy 1989 and Schulz & Powys 1998); common just to the W about lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986).

UPUPIDAE Hoopoes

Hoopoe *Upupa epops*

Months. Resident and Palearctic visitor.

Ecology. Relatively common in degraded bushland, roadsides, pastures, grassy areas about buildings and dams, and eroded luggas. Probes into ground for worms and other invertebrates, picks up insects from surface. One in a garden at Center pursued grasshoppers; it was followed by an African Drongo that pirated grasshoppers as they hopped in front of the Hoopoe. The Hoopoe finally shifted to probe-feeding and the drongo left.

Movements. Some move into areas such as bushland about GMF in wetter periods, and may breed in such sites. Variations in plumage make it difficult to assess numbers of Palearctic *U. e. epops* present (24 September–30 March), as *U. e. senegalensis* and *U. e. waibeli* also could occur (Fry *et al.* 1988); del Hoyo *et al.* 2001

noted that *waibeli* connects *senegalensis* with *africana*, and there is such variation in May–August Hoopoes (that should all represent *U. e. africana*) that we hesitated to designate racially every Hoopoe seen. We have over two dozen records of likely *U. e. epops* with gray-brown tone on the mantle and breast and more white in the wings, including one observed closely on a fence at Center 19 August 1992 (Cramp *et al.* 1985, noted that migrants begin reaching areas S of the Sahara in late August). (See Behavior below).

Behavior. Aggressive, countering and chase when defending territory. One of two calling, fighting MM at Center 1 December 1989, that were stabbing at one another, clasping and rolling about, was grabbed by a person pouncing on them (it was released later). Bows head, crest erected or not, with song notes. One singing, rusty African Hoopoe attacked and chased a gray-pink, whiter-winged, paler European bird about, calling, at EG 22 November 1993. On 27 April 1994 a brighter, whiter-winged (*waibeli*-like, see Fry *et al.* 1988) M sang and chased a duller, typically *africana* F, which also chased him; he then carried an insect, walking toward her, fluff-throated, singing, with wings half raised, crest rising and falling and tail spread. When the M reached the F, she leaned toward him, crest low, begging with several low “hoop” notes, then took the food item, and followed him across the grassy area (see Cramp *et al.* 1985).

Voice. Song “hoo” to “hoop” notes in series of one to five, usually two or three, louder or softer, very like song of African Cuckoo at times, often faster; ventriloquial, difficult to locate. Bows slightly to deeply, crest raised or not, with each note. M sometimes sings above its feeding mate. Song often starts softly (heard at close range), then builds to greater volume, as “ooot-ooop-ooop-OOP;OOP-OOP.” Some variation in songs was discussed by Cramp *et al.* (1985) and Fry *et al.* (1988). We question the restriction of singing to the breeding season, as those latter authors stated; Hoopoes have sung in every month in our study area, and the aggressing European (*U. e. epops*) Hoopoe reacting to the attacking (African) Hoopoe noted under Behavior (above) seemed to sing twice. The statement in del Hoyo *et al.* (2001: 402) that the African Cuckoo differs from the Hoopoe in singing a four-note song, the Hoopoe two or three notes, is erroneous (see e.g., Stevenson & Fanshawe 2001). Other calls heard include: the low “hoop” notes of the courting F mentioned above; and trilling (“brrdddr”) and skizzing (“skreee-skizz”) aggressive calls given in flight or in conflicts on the ground, and perhaps, re-

spectively, the rattling and cawing calls described in Cramp *et al.* (1985). Trilling was also heard from a M courting a F. Songs and some calls were recorded on tape.

Breeding. We have few breeding indications, but songs most prevalent April–September and November–February, displays of paired birds April–September and December–January, and fledged young seen January, point to breeding in these months. Hoopoes flying with food visible in the bill April–June, chases April–June and November–December, apparently of MM, and movement into GMF with regular singing April–July in some years, support breeding April–July and November–January (or -February). These periods are within and between the first and second rainy seasons, and late in, and following, the little rains. It is most unlikely that Hoopoes would breed in normally dry months (usually January–March and September–October) in our study area. Variations in rainy seasons, both in amount of rainfall and the seasonal timing, likely are reflected in the extensive breeding seasons of the Hoopoe shown by Brown & Britton (1980); for all of E Africa del Hoyo *et al.* (2001) gave only August–January.

BUCEROTIDAE Hornbills

Crowned Hornbill *Tockus alboterminatus*

Months. Common resident.

Ecology. Occurs at all wooded sites, especially riverine woods, but rare in far N (none at TA) and NE (none at FS, rarely seen at NP), probably reflecting need for quite large holes in trees for nests. More or less regularly breeds along Mukutan River and its tributaries, as well as all central sites. Forages in trees, sometimes on ground, at times hawks insects from a perch and, during termite emergences, flies like swallow or bee-eater, snapping at termites. Drops to ground, roller-like on grasshoppers, locusts and caterpillars (including *Cirina fonda*, among others). Bashes large caterpillars and locusts, mandibulating them for 2–3 or even 7 min before swallowing them. Eats figs, seeds of *Acacia gerrardii*, and fruits of *Cussonia horstii*; also takes red-legged frogs, chameleons, and one reported by D. Chepus to have taken a roosting African Scops-owl to its nest to feed to its mate. Joins mixed-species foraging flocks, especially with helmetshrikes, babblers and wood-hoopoes, and even ground-feeding starlings. Territory for breeding *c.* 0.5 km of riverine woods, but range widely after breeding, especially into bushland and wooded grassland outside breeding ter-

ritories; several family groups may meet at sources of fruit, with considerable interaction, including calling and sometimes displays.

Movements. As noted above; after breeding may forage in a radius of *c.* 3 km from the breeding site. No large-scale movements were seen such as Kemp (1995) and in del Hoyo *et al.* (2001) noted, or were any gatherings greater than five observed.

Behavior. Chased at times by Lilac-breasted Rollers and various passerines. Itself mobs perched eagle-owls *Bubo lacteus* and African Hawk-eagles. Gives sky-pointing (bill up vertically) displays and shuffle-wobbles on perch in courtship, and M courtship feeds F (see Fry *et al.* 1988, Kemp 1995).

Voice. Major call or song a series of sharp “pi” or “pee” notes, sometimes irregular in tempo, pitch and volume, as “pee, peep, peepeepeep, peepeep, peep;” notes higher-pitched and less clearly whistled piping than in Hemprich’s Hornbill. Other calls that seem inadequately described in the literature include: a) a buzzy oxpecker-like “zzz” series between paired birds, related to a hissing-skizzing note by the M in courtship-feeding; b) harsh “g’yeh” and “yek” calls by a sub-adult in hand, and, c) soft “peep” calls by recently hatched nestlings (see Fry *et al.* 1988).

Breeding. Nests April–September, peaking in May; nestlings and recently fledged young May–August and December–January; immatures with parents July–March. Calling peaks May–July, although calls heard in all months. Thus, seems dependent to some degree on big rains and area’s unique July–August rains; some occasionally may breed during the little rains. Nest failures to the fledging stage *c.* 30%; we have seen no more than two young within or out of nests, hence the larger clutch size Kemp (1995) reported may be an austral African phenomenon. Nests were mainly in *Acacia abyssinica* and *A. xanthophloea* trees, with a few in *Croton megalocarpus* and *Olea europaea*, at 0.4 to 7 m above ground (the 0.4 m nest was in a slit trunk opening, going upward from ground level, but the entrance was at 0.4 m, at SI, Fig. 11). A few may have originated as picid holes, enlarged over years through rotting, splitting of wood, and use by starlings, oxpeckers, parrots and honeybees; most of 33 nests were in natural holes, cavities of which may have had prior use by those other secondary hole-nesters. Fecal matter, molted feathers of the F from inside the nest, hard parts of insects, eggshells, and, once, the body of a dead hatchling hornbill were beneath the entrances. Wandering family parties reached GMF May–October.

Specimen data. Recently molted FF out of the nest were seen July–September. Seen up close at an NG nest, the F had a redder bill than her casqued-billed, more orange-billed mate; the nestling young had a yellow bill and gray eyes. One netted subadult M at EG 12 September 1987 weighed 222 g, had the bill pale orange, the eyes gray-yellow and the wing coverts spotted. Although we released it quickly, it took nearly 1 h for it to rejoin its parents. We saw it with the adults through December 1987, at EG, in the hills about there and to the LA site. Considered monotypic by del Hoyo *et al.* (2001).

Hemprich's Hornbill *Tockus hemprichii*

Months. All but March, December; irregular but sometimes common visitor and breeder.

Ecology. We have 86 records (68 from 1985–1991, 18 in only five of seven years of 1992–1998) from the CW and SW third of the study area, between PK, to the W of NP; MB, N of Center, Dirty Dam, and NG, and mainly along the Mukutan River and its tributaries (55 records from the Mukutan Gorge, Fig. 13, to MK and EG). We published on our initial records (Short & Horne 1985), noting that C. Francombe previously had seen Hemprich's Hornbills occasionally in the Mukutan. Flies more easily and often higher than Crowned Hornbills, several km or more without stopping, presumably seeking food. Catches emergent moths, and comes to netted, calling birds, also eats figs, berries and other fruits, and lizards. Seen singly, more often in pairs, also in family parties of up to five and in loose flocks to eight. Records mainly in an abrupt peak January–February (30 records, all in only five years), and May–September (56 records, 27 in August–September).

Movements. Seems to enter the study area from the W about the Mukutan River, records for most months in the Gorge and valley below MK. Probably breeds in the rocky Gorge of the Mukutan and W, some moving upslope (to 2000 m about Nglesha and Dirty Dam, and 1900 m along the Lugga Maji Nyoka and Okisim valley) after breeding. Moves, and attains elevations well above those usually noted (Fry *et al.* 1988, Zimmerman *et al.* 1996, Stevenson & Fanshawe 2001; del Hoyo *et al.* 2001 had it to 4300 m (*sic*) in Ethiopia). Hegner (1980) reported movement of this hornbill to the Nakuru area, mainly August–September, but to a lesser degree in February–March and October–November. Our study area, closer to the Baringo region breeding center (breeds there May–September, Stevenson 1980, though Kemp 1995 gave

March–May as the Kenyan breeding period), had more April–July, and especially January–February records.

Behavior. Little known (Fry *et al.* 1988, Kemp 1995). Interacts in flight, two approaching, in parallel, then beating the wings hard, making noisy sounds. In display calling to F, M may: a) arch the head-neck, lower its wings, raise the spread tail high over the back, calling “pyew-pup-pup-pup,” and b) raise the head and wings, and the spread tail high upward and forward toward the head, at which calls reach their climax, “pew-pew-pyew-pyew-pyew,” the notes rising in tempo and volume (for (b) see Fry *et al.* 1988). F may raise and lower her tail as the M calls and displays, or she may do this to playback of the M's calls. *Voice.* Song or call of variable notes, usually less high-pitched than those of Crowned Hornbill, rather whistled “pew” than “pee” notes, but varies more in Hemprich's, e.g., “pyew,” “pyow,” “pyeep,” and “yeep.” As in the Crowned Hornbill, there is variation in the tempo, pitch and volume of the notes in a series, such as “pyew, pyew, pew-PEW-PEW-PEW, pyew, pyew,” the louder notes rising in pitch and timed with high raising of the displaying bird's tail. Often starts pew series with a low “put” note. At their fastest and higher in pitch they can resemble notes of the Crowned Hornbill, and in fact Crowned Hornbills have approached, silently or calling, both calling Hemprich's Hornbills and playback of the same (nine instances widely separated in time, no two on the same day). When three mutually display and call, the rising and falling notes at times crescendo and sound (“ewewewew” to “popopop”) like bullets whistling overhead. Other variations in series calls are: “pup-pup,” “kwik-wik,” loud “eep” notes in the air, “kwee-kwee” notes, and tinkling notes between flying hornbills.

Breeding. Very likely breeds in the Mukutan Gorge, about the mouth of the Lugga Maji Nyoka (Fig. 13) and opposite the lower Kutwa Lugga that enters the Mukutan from the S. The very rocky, partly cliff-face, slopes of the Gorge and entering streams offer ideal nesting habitat for this rock-crevice-nesting hornbill (Kemp 1995, and in del Hoyo *et al.* 2001). At least four of the family groups seen about MK and the Lugga Maji Nyoka in July and August included one or two fledglings begging food from the parents and flying very weakly. Adults were carrying insect food to the young, rather than the latter flying to the adults as is the case of strong-flying, older accompanying young. We do not believe that these families with re-

cently fledged young came up from Lake Baringo, but rather think that they came from nearby nests, fledging in June–July. Family groups late July–February were largely comprised of adults and older, independently foraging, dark-billed immatures or subadults. Apparent courtship displays, and repeated calling of Hemprich's Hornbills observed as pairs, suggest some nearby breeding in August–November or later; the breeding season could be longer (or could vary, depending upon rainfall) but in general appears to be primarily May–September, as at Lake Baringo (Stevenson 1980).

Von der Decken's/Jackson's Hornbill *Tockus deckeni*
Months. January; one record.

Months. An orange-billed, spotted-winged M of *T. d. jacksoni* was feeding on fruits of a *Cussonia holstii* tree, along with many Red-winged Starlings in the Mukutan Gorge at the mouth of the Lugga Maji Nyoka 6 January 1995. Shortly after it left, a pair of Crowned Hornbills flew into the same tree to feed, and Hemprich's Hornbills later were observed nearby. Lewis & Pomeroy (1989) noted that Von der Decken's Hornbill occurs to 1700 m (race *deckeni*; it probably exceeds this farther E and higher on the Laikipia Plateau, as at Mutara Ranch, Olson *et al.*, undated MS) or (*jacksoni*) 2000 m, so a wanderer of the latter race up the Mukutan River to c. 1680 m from the Lake Baringo area, where it occurs commonly and breeds May–July (Stevenson 1980), is not unexpected. Kemp in del Hoyo *et al.* (2001) kept both as races of *T. deckeni*. We have not seen others, nor any of the race *deckeni* in the study area; the pale head would make it obvious among commoner Crowned and Hemprich's hornbills. Among the six species of *Tockus* found about Lake Baringo, with three occurring in the study area, perhaps the Red-billed *T. erythrorhynchus* and African Gray *T. nasutus* might be expected along the Mukutan River. Indeed, the African Gray Hornbill has been reported to us from there, and it may occur, but chances of confusion at a distance with dark-headed Hemprich's or Crowned hornbills make it prudent to await a more certain sighting.

Silvery-cheeked Hornbill *Ceratogymna brevis*

Months. January, May, June; irregular visitor, possibly breeds.

Notes. Reported occasionally at Nglesha by C. Francombe, and about the Mukutan early in May 1987 by S. Sassoon. We published (Short & Horne 1985) our May 1985 sighting of a calling F (likely M was near) in the Mukutan Gorge. We have since seen a

M near the MK site 1 January 1992, a M carrying food N across the Mukutan Gorge 2 June 1992, and two MM and two FF calling over us at NG 22 June 1994. Presumably these hornbills were foraging out from the highland forests fast-disappearing to the S, although the food-carrying June M suggests its breeding in the Mukutan Gorge. Its "gahw" to "g'ya" bellowing, or braying calls are distinctive. The large-casqued, calling M 1 January 1992 had brown-pink orbital skin, rather than the usual blue or purple skin (Fry *et al.* 1988, del Hoyo *et al.* 2001). We hoped to find ground hornbills, either the Northern *Bucorvus abyssinicus* that occurs S to Lake Baringo, or the Southern Ground Hornbill *B. leadbeateri* found SE of us on the Laikipia Plateau (Olson *et al.*, undated MS, Mutara Ranch, Lewis & Pomeroy 1989), but could find neither. Perhaps it is too densely wooded or bushed, and, where open, too degraded for it (see Secretarybird discussion above).

CAPITONIDAE Barbets, tinkerbirds

D'Arnaud's Barbet *Trachyphonus darnaudii*

Months. September; one record, vagrant.

Notes. A wanderer upslope from just W of the study area (common at Tangul Bei) to the NP site where we saw it, heard it sing one duet part (song) alone, and were able to net it. At 32 g weight and with wing 75 mm, it was, as expected a representative of *T. d. darnaudii*, presumably dispersing slightly out of the species' range (see Fry *et al.* 1988; Short & Horne 2001, 2002a). It was a non-molting individual, and was color-banded, but never seen again, nor did we hear or see this species again.

Yellow-rumped Tinkerbird *Pogoniulus bilineatus*

Months. Resident at Nglesha only.

Ecology. Regularly seen and heard at NG; only twice seen elsewhere, at Mad Dam near PO site 7 August 1989, and at ML 3 July 1990. Frequents dense woodlands, especially riverine woods and thickets (Fig. 15) in partly cleared surroundings. The Red-fronted Tinkerbird is sympatric with it, occupying the edges of woods and thickets about NG, as well as throughout the study area. Records away from NG probably represent dispersing individuals, which were seen but once. Feeds on fruit, fruit seeds and pulp (often singing with seeds stuck to bill), including those of *Triplaris grandifolia* and various mistletoes. Always alone, in pairs, or with dependent young.

Movements. Dispersal movements only, as noted above.

Behavior. Discussed by us elsewhere (e.g., in Fry *et al.* 1988, Short & Horne 2001, 2002a). Conspecific interactions frequent, also with Red-fronted Tinkerbird (one Yellow-rumped supplanted a netted Red-fronted when latter was released, and comes to latter's calls at times) and Spot-flanked Barbet (a Yellow-rumped feeding in the nest tree *Acacia abyssinica* of the Spot-flanked Barbet was driven off by a M of the latter.).

Voice. In East Africa its paused-popping song is diagnostic. Much of the year the phrases between pauses contain three to five notes, and are regular throughout the song, except that the last phrase of a long song usually contains fewer notes than preceding phrases. In the breeding period, when interacting with other conspecifics or Red-fronted Tinkerbirds, phrases contain more notes and are less regular, e.g., 2-5-8-6-5-5-6-5-6-3-8-6-6-5-7-9 (unusual ending), and 4-5-6-10-14-20-13-14-3. The latter series had more notes in a single phrase than any we have heard (see Fry *et al.* 1988), although one at Nanyuki in 2001 consistently sang 20-38-note, non-paused popping. Also utters: series of fast multiple pops; hoarse honk calls; hissing notes; a grating "tzip-ip, tzzzzeh," and others. All of these heard at NG.

Breeding. Few details indicate breeding, particularly because the NG site was visited at relatively long intervals, and were very busy there (see van Someren 1956, who found them starting excavations in every month, most never being finished). Singing, use of diverse calls, chases and interactions, suggest breeding May–September and October–January, thus about the times of the three rainy seasons and thereafter (Short & Horne 2001). A nest was found in April at Nanyuki.

Specimen data. Only two netted at NG, one 26 December 1988, the other 18 December 1997. The former was seen there 15 May 1991, 29 months after its banding. The two respectively weighed 13.75 and 12.75 g; the former was in molt, the latter had wing 53.5 mm. We noted the gape as pink with a red tinge and black where meeting the bill, hence it forms a pattern in gaping, aggressive tinkerbirds.

Red-fronted Tinkerbird *Pogoniulus pusillus*

Months. Fairly common resident.

Ecology. Occurs in woodland, riverine woods, bushed woodland and wooded grassland about all sites and elsewhere. We have 204 records for the first seven years and only 109 from the second seven years of the project, with less consistent singing, fewer birds seen, and presence regularly at fewer sites in recent years. Possibly adversely affected by 1980s fires and by clear-

ing of wood for firewood and construction. At any rate, only 16 records for 1997 and 1998, with only TA, PO, and NG represented by more than one sighting. Courtship-fed *Rhus* sp. fruits. Takes termite workers and soldiers from tunnels on dead trees or branches (see Fry *et al.* 1988 and Short & Horne 2001 for other foods). Interacts with Red-fronted Barbet, both feed at times on same fruits, but hardly competitors for most foods and not for nest-sites. Sympatric with Yellow-rumped Tinkerbird at NG (also at Nanyuki in the SE of the Laikipia Plateau, and parts of coastal Kenya, see Fry *et al.* 1988); tends to forage in thickets and woodland edge more than its congener, and the two tend not to sing at the same times. Regularly occurs to 2000 m (Lewis & Pomeroy 1989, Short *et al.* 1990). Bathes at times in streams.

Behavior. Discussed by Fry *et al.* (1988) and Short & Horne (2001). Raises forehead patch, cocks tail at times to playback of its voice, comes to playback of Yellow-rumped Tinkerbird's song, and may call after Red-fronted Barbet calls.

Voice. Popping song (Fry *et al.* 1988) uttered all months; multiple piping to popping, fast trills April–September and November–January; grating calls "ggrrrrt, ggrrrt" given May and July–December. Popping at 102–120 notes per min, multiple pops at *c.* 50 per min, and grating bursts at *c.* 24 per min. Slow popping at 43 to 56 pop notes per min also heard occasionally. Often shifts from popping to trill, as "pop-pip-pip-pipip, pipipipip." Grating, as "nnnych" heard when M interacts with F or two MM interact in presence of F.

Breeding. Mainly based upon calling and behavior, likely May–September and November–January. Grating, courtship behavior, strong interactions with chases, and excavated holes indicate this seasonality, which encompasses all three rainy seasons. Only three possible cavities found that could have been roosting or nesting holes, two in thin small dead branches, one in a large dead *Acacia abyssinica*. They likely do not nest in the woods around which our honeyguide studies were carried out, have large territories-home ranges, and are difficult to follow with large mammals about. March–April and October were periods of low-level vocal activity; they tended to become territorially active after the onset of the rains. Juveniles were not obvious; they leave their parents rapidly, we surmise, after being led to sources of fruit that they can eat without help.

Specimen data. We netted eight, all apparently fully adult (red forehead patch present). These were taken at diverse sites in January (two), April, June, July, Sep-

tember, October, and November. Weights for eight MF were 9.25–13.5 g (10.8 g); wings of six MF were 50–53.5 mm (51.9 mm). The heavy (13.5 g) tinkerbird of 5 April 1993 had an orangey-red forehead, approaching the condition sometimes found in Yellow-fronted Tinkerbirds *P. chrysoconus* in W Kenya (Short *et al.* 1990). These represent the subspecies *affinis* (Fry *et al.* 1988, Short & Horne 2001, 2002a).

Red-fronted Barbet *Tricholaema diademata*

Months. Resident.

Ecology. Generally common in bushed acacia woodland and degraded acacia woodland in N half of the study area, S to Kuti and occasionally MK, and acacia crossing; irregularly along S border and pastured area N of Main Gate, possibly attracted to fence posts in those sections, for roosting and nesting cavities. Eats fruits, also termites (taken from their tunnels on trees, and alate termites taken on wing, see van Someren 1956), and other insects. Egests remains of insects and fruit pits occasionally. Drinks water in tree crevices. Present at MB site 1989–91 using cavities in dying or dead crotons for roosting and nesting, until Bearded Woodpeckers enlarged their entrances and usurped some cavities.

Movements. Sedentary, disperses into habitats immediately surrounding nesting sites, especially into *Combretum* wooded grassland and along edges of luggas.

Behavior. Hoop song uttered with bill downward, red forehead feathers spread; at end of song raises head and looks all about. Fights with other hole-nesters at times; is attracted to song of Red-fronted Tinkerbird and vice versa (the two are broadly sympatric). Flips wings during interactions, uses fluttery display flight at times (see Fry *et al.* 1988). M courtship-feeds F. Copulation occurs without ceremony (Short & Horne 2001, 2002a).

Voice. Hoop notes in series are song, may vary in volume, tempo, and number in song (faster, more notes in response to playback; responded well to playback of Miombo Pied Barbet *T. frontata*). Hoarse hoot notes may be interspersed in hoop songs at times. Nyah call is another series call, or song, often heard in response to hoop songs, by mate or other bird. This call varies about same as hoop song, soft “nekh” or “negh” version in interactions. Grating calls (“skizz”) occur during interactions, nest changeovers, and courtship feeding. Wing-rustling sounds accompany aerial approaches to playback of its voice and during interactions.

Breeding. Nests mainly March–September; probably to a lesser degree, November–January. Thus breeds

during and following the three rainy seasons. Seven nests in April–September, copulations (several), courtship-feeding and other intra-pair displays, and vocal activity (greatest May–July, with April and August–September songs slightly more frequent than those in November–January) are indicators of such seasonality. The April nest contained nestlings, so eggs laid in March (two young fledged in May); copulation and incubation in August and feeding of young in nests in September mark the other extreme of the March–September season. Nests were at 1–7 m in *Combretum molle* (two), *Euphorbia candelabrum*, and *Acacia gerardii* stubs, and fence posts (three). One fence post nest, at TA (Fig. 8), excavated by Cardinal Woodpecker originally, was used successfully by Red-fronted Barbets in April 1995 (nestlings 23 April) and again by that species in August 1996 (two eggs 23 August). This shows year-to-year variation in nesting time (whether or not by the same pair of barbets). When we found the August nest the top of the post had recently been broken by elephants, such that the barbed wire held the broken top to one side, with the barbet eggs exposed above them through the top of the nest (we wired the stub top back onto the post; the barbets accepted the repairs and returned to incubate the eggs!). We had one instance of a third adult or more likely subadult about a nest at PK; this individual was tolerated by the primary pair, and was near the nest several times, but never entered it.

Specimen data. We netted 21 Red-fronted Barbets, 16 were adults; the latter weighed 28.5–34.8 g (31.5 g), unsexed (n = 16). Only six adults were sufficiently fresh-plumaged for wing measurements: 79–83 mm (80.3 mm). The other five birds were subadults (three) and juveniles (two); the latter had little red on the forehead and a trace of tomial teeth (see Fry *et al.* 1988). The subadults weighed 31.3, 27.8, and 28 g; a juvenile was unweighed, and the other, a recently fledged barbet weighed 37.5 g, our heaviest weight for this species. The immatures were from May and June, the subadults from July (two) and September. Adults in early to mid-molt were in May–July, a late-molting adult was netted January, two starting molt were weighed November and December, and the six fresh-plumaged adults were from February, May (three), July and September. The variation in stage of molt, which is usually common in the mid-to-late breeding season, suggests variation in the breeding periods of these barbets, those breeding later probably molting later. The superciliary stripe is very bright yellow ahead of the eye gradually, paling to white at its

rear (it usually is illustrated pale yellow in front and white at the rear). The orbital skin is black. The gape is dull pink, the tongue white; the tongue is cleft with a “brush” (fine, hair-like projections) at the tip (Short & Horne 2001). The barbets represent the race *T. d. diademata* with sparse ventral spotting; varies, usually has a few flank spots and may be a few on thighs and undertail, but several have the sides and flanks spotted. The races are weak, and individuals well within the range of each race approach the spot condition of the other (see Fry *et al.* 1988), hence depiction of only racial extremes (see Stevenson & Fanshawe 2001) is misleading. Immatures of all populations tend to be more spotted below than are adults.

Spot-flanked Barbet *Tricholaema lacrymosa*
Months. Resident.

Ecology. Common, at least two pairs, at NG only, in dispersal perhaps E to Poromoko area along S border. Usually forages in riverine woods dominated by *Acacia abyssinica*, but also into neighboring thickets, feeding on fruits. Gleans, flycatches, takes insects and spiders to feed young; berries and fruits include those of *Trimeria grandifolia* (tropica, Flacourtiaceae), *Lantana trifolia* seeds, and mistletoe berries. Occurs nearby to the W at lower elevations (Tangul Bei, pers. obs.), where Red-fronted Barbet is sympatric. These two congeneric barbets occur together in places, e.g., Nanyuki, Tangul Bei; Spot-flanked is inevitably in lush vegetation near water. They are allopatric in the study area, perhaps due to degradation of riverine habitat unoccupied by either.

Movements. Only dispersal movements.

Behavior. Interacts with Yellow-rumped Tinkerbird, chases it at fruit sources. Pale-eyed M cocks tail and flips wings during changeovers at nest with dark-eyed F. When calling M cocks tail, erects head and rump feathers and calls, bill pointing downward (see Fry *et al.* 1988, Short & Horne 2001). Flits wings, partly cocks tail in chasing Lesser Honeyguide.

Voice. Primary calls are hoop song and nyah series call, both more variable than in Red-fronted Barbet; hoop song higher-pitched and notes usually uttered more slowly than in the latter species, whereas nyah call is lower-pitched, faster and with shorter notes than in nyaaa call of Red-fronted Barbet. Hoop can be uttered slowly or rapidly, notes may be “oop” or “pup;” also wup notes are similar, wup series may be location call (see Fry *et al.* 1988). Nyah call, nasal in tone, may be softly uttered at times. Variable notes during changeovers are: “schweh,” “shree,” “skree,” “tzeh,” “tzeh,”

and “yeh-yaaaaa.” About the nest the pair softly call “chuk, chuk, chuk.” The F sometimes utters a “chi” series in changeovers at the nest. Hoop and nyah calls are heard all year.

Breeding. Nests April–October; nests on same territory in September 1986 (incubating), June 1991 (incubating), October 1992 (nestlings) and April 1993 (incubating). Just to the W we saw fledgling young in August 1977. The June 1991 and October 1992 nests were in the same cavity, and probably involved the same pair. Breeding thus can occur about all three rainy seasons in the study area. Nests were at 9–16 m on the underside of large branches of partly dead *Acacia abyssinica* trees beside a stream. During incubation the F shifted more often. Some 10 intervals were noted as 12–45 min of incubation per bird. Nestlings are fed primarily insects and spiders at first, by the beakfull, then later, berries and other fruits as well. We suggest that wet season breeding of this barbet in the one portion of the study area that it occupies is enforced by the uncertainty of rains and need for fruits to feed growing young; hence there is no evidence of a peak in the January–March dry period noted by Brown & Britton (1980) for the region generally (they likely had a sample from wetter highland areas near the center of human population). A 7-min chase of a Lesser Honeyguide, and several appearances of this honeyguide about nests of Spot-flanked Barbets at NG, suggest that this honeyguide uses the barbet as a host.

INDICATORIDAE Honeyguides

Brown-backed/Wahlberg’s Honeyguide *Prodotiscus regulus*

Months. April–December, may be a visitor and certainly moves locally.

Ecology. Some 31 sightings (nine in the last seven years of the project) at scattered, wooded sites in all parts of the area. Feeds singly in foliage but mainly above c. 6 m. Gleans for scale-insects and other insects, and hawks for insects with gusto (tends to perch longer, hawking flights shorter than in flycatchers such as Dusky Flycatcher). Joins mixed-species foraging flocks containing species of cuckooshrike, warblers, flycatchers, tits, weavers and drongos. Especially frequents acacia trees.

Movements. Not consistently seen at any single site and only once at a number of sites. Moves along streams and luggas, as at PK and the Mukutan River sites from SI to MK. Known hosts (petronias, sunbirds, cisti-

colas) are common locally, should be more regular and breeding (see Fry *et al.* 1988); only two records (April, December) in months between November–May suggest that it mainly is a visitor.

Behavior. Sings with head forward, bill nearly horizontal, and forehead feathers erected (see Fry *et al.* 1988, Short & Horne 2001).

Voice. Buzzy trilling song, vaguely reminiscent of that of Scaly-throated Honeyguide, generally a bit buzzy and tending to end in a squeaky “eet,” compared with southern African tape-recorded songs. Two in a chase gave a buzzy, grating-like “bzzz-a-zzz-zzz-za-zzz,” possibly a courtship-related call (see Fry *et al.* 1988, Short & Horne 2001). Songs were heard April–October, i.e., in all months in which this honeyguide was seen except November and December. One repeatedly called “tsir-ik” and “tsi-tink” at us.

Breeding. Other than singing, two juveniles observed (August, November), and a possible courtship chase (May), there is no conclusive breeding evidence. The juveniles were feeding on their own and could have come from elsewhere, to the S or SE (see map in Lewis & Pomeroy 1989). At PK in May 1994 and 1995, and June 1992, but only three songs heard; and at SI, singing frequently on four consecutive days of July 1987, but not before then nor again that year at SI. Thus behavior not consistent with its breeding, although it may do so sporadically.

Pallid Honeyguide *Indicator meliphilus*

Months. January–June, August–September, December; uncommon visitor-resident, lower Mukutan River.

Ecology. Known only from sites about the lower Mukutan (MK, EG and the Maji Nyoka or Python Pool, with 32 records; the nine records since 1990 all at Python Pool, the only regular singing territory known to us. Ecological details in Fry *et al.* (1988) and Short & Horne (1990, 2001, 2002b). Gleans, dashes to pluck insects and hovers as well as hawking insects. Eats beeswax by scraping walls of abandoned honey beehives. In the study area favors *Acacia xanthophloea* along the lower Mukutan River and basal parts of its tributaries.

Movements. Associated with the lower Mukutan River, moved up and down the river, and not seen July and October–November; however, likely resident in Mukutan Gorge area. If a visitor, may come from W or S.

Behavior. In study area interacts at times with Lesser Honeyguide (chased by it, or occasionally chases it)

and with flycatchers such as White-eyed Slaty Flycatcher. Submissive-aggressive fluffed posture assumed in presence of larger honeyguides. Singer “hunches,” arches head like Scaly-throated Honeyguide, turns head side-to-side watching for respondents, and twitches tail in time to notes of song. To playback reacts by erecting crown feathers, erecting and lowering body feathers, flitting tail and wings, and may lash tail side-to-side. Stilted flight displays occur (January–February), and also winnowing flight displays (Fry *et al.* 1988, Short & Horne 2001).

Breeding. Almost certainly breeds at Maji Nyoka, where a territory has been more or less continually occupied by a singer since December 1982 or earlier. Netted immatures in August and September included two with remnant tarsal scutes, lost by 3 months of age, so breeding presumably in the big rains April–May and thereafter, into June–July, when the July–August rains more or less regularly occur. Possibly uses Red-fronted Tinkerbird (only known host is Yellow-rumped Tinkerbird) as its host, otherwise woodpeckers such as the Cardinal, and perhaps Yellow-throated Petronia are potential hosts (Fry *et al.* 1988, Short & Horne 2001). Possibly also breeds November–January, as December a regular month for song over the years; but like most honeyguides sings much of the year to hold territory.

Specimen data. An adult and three immatures netted and color-banded (none seen again); adult 11 May 1985, weighed 14.4 g, wing 74 mm, in fresh plumage. The immatures netted 15 August 1986 and (two) 21 September 1987, all at MK, weighed 14.5–17.2 g, with wings 67.5–72 mm. The immatures all had white tips of rectrices 3–5, (the rectrices were pointed at the tips) and they lacked the vestigial outer (10th) primary. Without a malar mark the immatures appeared like a small immature Lesser Honeyguide; the tiny raised nostril covers are smaller than in young Lesser Honeyguides. Two showed barest traces of the (incoming) adult white loreal mark. Soft parts: bill black except for pink basal half of mandible; orbit pale gray; eyes umber brown; legs and feet, including toe pads, dark gray (see Fry *et al.* 1988, Short & Horne 2001, 2002b).

Lesser Honeyguide *Indicator minor*

Months. All, much movement and some are visitors; some present all year.

Ecology. The c. 600 netted and re-netted, along with Scaly-throated and Greater honeyguides making up the 1762 netted in the course of our honeyguide

project, will be the subject of a separate publication, hence few details are included here. In years with more or less average rainfall hundreds of immature Lesser Honeyguides drift into the study area, along with some adults; only two of our sites (PO and NP) regularly have a singer and perhaps a half-dozen singing territories are within the study area in any one year. In the year following the 1984 drought year only seven adult Lesser Honeyguides were netted, whereas immatures outnumbered adults among the *c.* 45 netted yearly thereafter. Likely that the common, resident, larger Scaly-throated Honeyguides occupying wooded areas and edges favored by Lesser Honeyguides impact upon the latter. In only one of the 16 sites occupied by Scaly-throated Honeyguides is there a more or less regular Lesser Honeyguide singing territory, and it is at the margins of territories of Scaly-throated Honeyguides.

Movements, Behavior, Voice, Breeding, Specimen data. Will be covered elsewhere in a treatise on the honeyguide project (see also Fry *et al.* 1988; Short & Horne 2001, 2002b).

Scaly-throated Honeyguide *Indicator variegatus*

Months. Common resident of woodlands and riverine woods.

Ecology. This was the focal honeyguide of our study, results of which will be published elsewhere (see Fry *et al.* 1988, Short & Horne 2001, 2002b). Singing territories maintained essentially all year at most sites. Forages into bushed woodland and sometimes bushland from wooded sites. Found our wax storage shed at GMF, which became a major site with *c.* 20 or more feeding there daily at times, but it never became a regular singing site. Eats beeswax, forages for insects on bark and in foliage, as well as in crevices and cavities in trees; hawks for insects, especially winged termites during emergences. Monitors humans, follows them in woods; often the first honeyguide at the opening of a beehive. There was no evidence whatsoever that this honeyguide guides humans to beehives, although it is familiar with most active beehives in any area. Dominant over other honeyguides except Greater Honeyguides at wax sources, and juveniles often are dominant over adults of the latter, as well as over conspecific adults. Some FF and primary singers among MM are faithful to a site, but may travel up to 4–5 km to a feeding site; others, especially young birds, wander from site to site, staying for a time in the vicinity of any source of wax.

Movements, Behavior, Voice. Will be treated in detail elsewhere. Honeyguides are vocally complex, having

acoustical, vocal and non-vocal displays that are not even suggested in field guides.

Breeding. This, as other facets of its biology, will be described elsewhere. At least MM are ready to breed at any time, and over years we have evidence of breeding activity in all months but March (and in the few years with rain in January–February may have bred in March). The main peak of breeding is April–September, with breeding thereafter in some years. Thus coincides with rainy seasons (big rains, July–August rains, sometimes little rains), except in very wet years with extended, heavy rainfall, in which breeding, correlated with that of host woodpeckers, occurs September–January or beyond. Nubian and Gray woodpeckers are the preferred hosts in the study area.

Greater/Black-throated Honeyguide *Indicator indicator*

Months. Common resident.

Ecology. Found in all but the most open, grassland habitats, sympatric with the other honeyguides but more regularly frequents bushland and wooded grassland. Singing territories in woodlands and riverine trees are more apt to center outside these, on surrounding slopes in bushland and degraded woodland. It is the only true “honeyguide,” leading humans to beehives, but guiding behavior (see Fry *et al.* 1988) is very irregular. We often see, hear and handle one to five Greater Honeyguides a day with no occurrence of guiding; when it occurs, the prospective guider may call and attempt to guide throughout a morning. One can “trick” a guider (by sporadically following) into leading one to four–five hives, the locations of most of which are known to us, and of course all are known to the honeyguide. Eats beeswax, and insects secured by gleaning and, occasionally, by flycatching. At beehives is dominant over other honeyguides (except some juveniles of Scaly-throated and Lesser honeyguides), and distinctively-plumaged immature Greater Honeyguides are dominant (“superdominant”) over all honeyguides, except conspecific juveniles. Other details will be published in a treatise on honeyguides.

Movements, Behavior, Voice. Will be discussed elsewhere (see Fry *et al.* 1988; Short & Horne 2001, 2002b).

Breeding. Largely to be discussed elsewhere (see above). As in Scaly-throated Honeyguide, singing can be heard all year, and breeding, although usually April–September, can occur later (or not at all in drought years). Usually mates in or near singing territories of MM, but M may display over a perched or feeding F anywhere; such a M may then sing nearby (not in

its singing territory), and may mate with a F if she is in breeding condition (M may mistake an older immature for a F and may display to molting, non-breeding FF). Hosts seem primarily to be Greater Blue-eared Glossy Starlings, Rueppell's Long-tailed Starlings and Green Wood-hoopoes, all of which are rainy season breeders, the starlings entirely so (see also Fry *et al.* 1988; Short & Horne 1990, 2001).

PICIDAE Wrynecks, woodpeckers

Rufous-breasted/Red-throated Wryneck *Jynx ruficollis*
Months. All; resident NG only, casual elsewhere.

Ecology. During the study found only at NG and once near the Main Gate, but seen by Horne 22 March 1968 on Kuti Hill, and may occur sporadically in wooded grassland. At NG in riverine woods, but also in somewhat park-like, pastured thicket-*Acacia abyssinica*-grassland (Fig. 15), where it feeds at times on the ground. Also forages in bushes and trees, eating insects, especially ants (Short 1982). Likely occurs in cultivated country S of the study area (see Lewis & Pomeroy 1989). Probably overlooked when not calling; it called in all eight months (January, April–July, September–October, December) in which it was noted (19 times in all). There are two, possibly even three pairs at NG.

Movements. Believed a resident, but dispersal wandering occurs; known to occur sporadically at various sites (Short *et al.* 1990), staying for several days or a season, then perhaps disappearing to reappear two years later.

Behavior. One singer knocked from a perch in a dead tree by two African Thrushes. Bobbing, swinging side-to-side movements, spreading of rufous throat-breast feathers and cocking of tail (Fry *et al.* 1988) noted in likely MF displays without chases. Likely M ran up limb after F. We observed allopreening of a pair.

Voice. Distinctive long call or song of “kweek” notes (Short 1982, Fry *et al.* 1988, Winkler & Christie 2002); notes sometimes bisyllabic, “ka-week.” Low “wikka” or “peegeh” calls with head-swinging displays, also “nyeh” calls in series by M or F. Adult followed by fledgling uttered “kwa-kwa-kweek,” double- or triple-noted calls, the fledgling calling in buzzy chattering notes.

Breeding. Displays of pairs in January and September; nest 20 April 1996; fledgling from that nest 22 May 1996, and one with adult 28 May 1995. Breeding thus is during the big rains; possibly also prior to and following the little rains (Brown & Britton 1980 had

a single May record from our region; Winkler *et al.* 1995 gave January–June for E Africa). The April nest had incubated eggs. The fledglings were being fed insects taken in an *Acacia abyssinica* in which Gray and Brown-backed woodpeckers also had fed. Fledglings had a more buffy crown, barring on the throat which was only partly rusty, and pink legs (see Short 1982, Fry *et al.* 1988).

Nubian Woodpecker *Campethera nubica*

Months. Resident, the commonest woodpecker.

Ecology. Found in all habitats with accessible and suitable trees for excavating nesting and roosting cavities; readily excavates in fence posts, so occurs adjacent to pastures and airstrips where it regularly feeds on the ground. Ranges through bushland that usually lacks nesting/roosting potential. Abundant in riverine woods and woodland, and their edges. Ground-foraging for ants and termites occurs more than we thought previously (Short 1982, Short & Horne in Fry *et al.* 1988), the woodpecker working to the ground from bushes or trees, or flying out to mid-pasture and airstrips. Most foraging is by gleaning and probing in ground or on trunks and branches of trees and bushes, fence posts and fallen branches. Rarely excavates into wood, tapping uncommonly heard at a distance. Joins mixed-species foraging flocks at times. It is badgered by honeyguides, especially the Scaly-throated, and occasionally supplants one of them; and it interacts especially with the Gray Woodpecker, which has somewhat similar nesting-cavity requirements, and with Greater Blue-eared Glossy Starlings that usurp its nesting/roosting holes. Territories are loosely defined and maintained, as habitats are irregular and the woodpeckers wander outside of them into areas in which there are few or no nesting possibilities, as about GMF at times. Well-wooded sites may support three pairs which interact frequently when in or near the breeding season. Can hop sideways (body parallel to ground) down tree or sapling.

Movements. Resident, moves in dispersing and as above when not breeding.

Breeding. Interacts at least vocally with Gray Woodpecker and Cardinal Woodpecker, may chase or supplant either, and sometimes chased by Gray, and also by larger Bearded Woodpecker. Has to keep starlings, oxpeckers, sparrows, and other secondary hole-nesters from its nests. Waves spread wings, swings head and bobs it (Short 1982) in intraspecific conflicts including M-M and F-F interactions. Dispersal probably effected by adults warding off, and finally attacking

fledged, independently-feeding young that interfere with duets between the two parents. Joins in mobbing predators, as slender-tailed mongoose *Herpestes sanguinea* that raided one nest; M successfully used wing-bashing attacks in saving the second nestling at nest from Greater Blue-eared Glossy Starlings that dragged one young Nubian Woodpecker from the nest and killed it.

Voice. What we have heard from them in the study area enlarges upon their known repertory (Short 1982, and in Fry *et al.* 1988; Winkler & Christie 2002). Long call or song a whistled series of “weee” notes (readily mimicked by a human) that shorten and speed up. It functions as a contact call, as well as in territorial maintenance, often uttered by one woodpecker, then answered by its mate, after which one may join the other in a “duet” (if away from territory, this serves in maintaining the pair). Duets are usually unsynchronized simultaneous songs, that of M often continuing beyond end of F’s song. Repeated duets by several pairs may establish or re-establish territorial boundary, and mark breeding at the optimal sites. Songs may be heard from well after dawn, in the study area *c.* 06.20 h onward, to near dusk, rarely to near dark (18:51 h in study area). Song may begin (rarely) with a trill, a wavering “bddd-bddd-bddd-bdddrrrrr,” reminiscent of song of Bennett’s Woodpecker *C. bennettii* (Short 1982), and sometimes ends in a “kik” note. Alarm calls are loud, staccato “keek-eeek-ik-ik-ik” or lower “pi-pi-pi” series, reminiscent of main call of Tullberg’s Woodpecker; also a “ta-ha-ha-ha” (may give either form of call when released from being held). Alarm calls also are used in mobbing. Softer “ikka-ikka” or “wikka” (Short 1982) calls mark interactions, conflicts between individuals of the same sex, or members of a pair. A fledgling uttered a “purr-rr-ritt” call, but mainly give plaintive “squeep” notes; the alarm of immatures is “dddititit.” Adults calling to young to follow them may give *sotto voce* song notes, or a series of “eee-ya,” compound notes, or a wikka call variant, “tree-tit, tee-tee-tee-tit.” Many vocalizations were tape-recorded.

Breeding. Breeding peaks May–July, with a lesser peak December–January; nests found April–September and November–January, pair displays April–July and November–December, fledged young seen June–October and December–February, and lone subadults August–November and February (peaks based upon 20 definite nests and six likely ones). “Nests” can be mistakenly inferred from roosting cavities, especially during excavation, but paired birds entering a cavity

are an indication of intent to breed, and replacement of an individual by another of the opposite sex, as well as entering a cavity with food, are clear indications of nesting. The molting regime (June–April, peak July–September or July–October), molt commencing more or less in the middle of the breeding period, is in accordance with the above breeding schedule. Thus breeds from late in the big rains into the July–August rains, and following the little rains. Honeyguides are a major problem, with the Scaly-throated Honeyguide and occasionally the Greater Honeyguide parasitizing Nubian Woodpecker nests (five or more cases). Nests were excavated in fence posts (12 cases or more, these at 1.0–1.5(-5) m), and in olive (six nests), *Croton* sp. (two nests, one natural cavity), *Euclea* sp. (one), *Acacia abyssinica* (four), and *Acacia xanthophloea* (one). Except for the fence-post nests, nests were at 0.7–13 m (mean 4.6 m, or for 23 nests including fence posts 3.2 m). Most nests could not be monitored because of our irregular schedule, and we were reluctant to approach nests because of the terrific predator-human association. We never found more than two eggs, or two-three young within nests, nor did we find adults feeding more than two fledglings, hence the average clutch likely was two or three eggs rather than the two-five in Fry *et al.* (1988): see also Winkler & Christie (2002). Desertion of nests is high, and many incipient nesting holes are abandoned or relegated to casual use as roosting holes when there is human activity close by.

Specimen data. We were able to net 32 Nubian Woodpeckers and rescued the body of one nestling taken from its nest and killed by starlings. The nestling, *c.* five to seven days old, had the remains of its egg tooth and a wattle at the corners of the gape; it weighed 29.5 g, and came from LU 20 June 1992. Two recent fledglings, both F, were: a brown-eyed one, not weighed, 7 August 1986 from MK; and a gray-white-eyed F from PK weighing 62 g on 14 October 1992. Older, red-pink-eyed subadults, both M, were from MK 14 February 1986, at a weight of 58 g and from PO on 1 May 1996 that weighed 56 g. Only nine were adult MM from six sites; they weighed 62–70.3 g (mean 65.2 g), and seven had wing 106–119 mm (mean 110.3 mm). Two were retrapped 1.5–2.5 years after they were banded, one was netted both 10 months and 38 months after it was initially banded, and one was observed at MK 5.5 years after being banded. For unknown reasons 19 FF (vs nine MM) were netted, the 19 weighing 56–70 g (mean 61.0 g); 13 of these had the wing 104–113 mm (mean 108.7 mm). These

included an adult banded 11 September 1988 at MB, retrapped there 11 May and 5 August 1989, and again at the same net site (we try to use the same net lanes to avoid degrading a site) 27 May 1996, hence the F was at least nine years old. Its weight consecutively was 66, 72, 73 and 69 g on those respective dates and the average of 70 g was used in the weight summary above. MM appear to be slightly heavier and longer-winged than FF; weights include some more and less than in Winkler & Christie (2002). Soft-part colors: The black bill often is very dirt-encrusted. The eyes in adults vary from pink-red to ruby red and once nearly purple, but usually are red with a variably wide outer creamy white ring that gives the eye a milky or pink appearance in some individuals. One F banded at GMF had the iris of each eye "broken" by a melanic portion in the front, rendering the red iris the shape of a horseshoe, recalling such marks in the iris of some toucans (Short & Horne 2001). All of the banded woodpeckers seen or retrapped later were at the site where they were originally banded. All were of the nominate race (Fry *et al.* 1988, Winkler *et al.* 1995).

Tullberg's/Fine-banded Woodpecker *Campethera tullbergi*

Months. Resident; uncommon, probably only two pairs, at NG.

Notes. Observed and voice recorded on a total of only five visits to NG in five months of five years, this highland forest woodpecker is particularly inconspicuous (see Short 1982). A M gave "tik-kik-ik-ik" calls perched in an old, dense olive tree; the call is similar to the alarm call of Nubian Woodpecker. One M fed with White-headed Wood-hoopoes. A pair gave low "kwik" calls. A F in a croton pecked away at lichen clusters, tearing *c.* 10 of them apart, then tonguing or gleaning insects uncovered thereby. We noted that it often hangs upside down and frequently uses small, dense trees. All were seen in the dense riverine woods at NG, although the pair flew out into adjacent thicket-grassland. This is the N-most occurrence of the species in the E highlands; probably a relict in the remnant forest at NG. It does occur down to 1500 m in some places (Lewis & Pomeroy 1989). The nearest population is in the Nyandarua Mountains to the S.

Cardinal Woodpecker *Dendropicos fuscescens*

Months. Resident, formerly common, now less so.

Ecology. C. 280 records, 170 in the first half of the project and 110 in the second half, from all parts of the study area, but especially the central and N sites

and surrounding habitats. Seeks dead wood in open woodlands and edges, often favoring acacias. Fed on trunk at times, but mostly on dead, small stubs and branches, and hanging dead wood. It is frequently seen at elephant-browsed dead tips of acacias. Rarely feeds on wood on the ground. At times feeds on sticks of fences. When feeding near one another (usually is alone, except prior to breeding), the M frequents larger stems, branches 4–10 cm thick, while the F feeds 1–4 m away in twigs and fine branches. Works through open bushland, probing and gleaning on dead parts of one tree or bush, flying 10–30 m to another, and onward, covering a large area. As the smallest picid, gives way to Nubian, Gray, and Bearded woodpeckers; these may impact on the Cardinal Woodpecker's territorial size and shape. Sings in tree-tops. For foods and other aspects of ecology see Short (1982), Fry *et al.* (1988), Winkler *et al.* (1995), Winkler & Christie (2002).

Movements. Resident; as territories do not regularly abut, often forages over a large area, even to 1 km or more.

Behavior. Bobbing, swinging, wing-waving, and erecting of crown-nape feathers (showing sexual markings) are favored displays of MM and FF in courtship and in aggression (Short 1982). Dispersal of young may be assisted by M aggression toward older juveniles.

Voice. Main call a fast series increasing in tempo, with notes shortening, uttered by both sexes at all times of the year (more frequent when breeding); also used in response to Nubian and Gray woodpecker calls at times. Also gives rattle calls (Fry *et al.* 1988, Winkler *et al.* 1995) during interactions, with a few variations, as a slow rattle "ti-ti-ti-tyet" of a F when released after netting. Also "wikka" calls during interactions, as "wikka-weeka-week" of F to M. Alarm call is a "keeeak." Both sexes drum, a soft "bddddddd," heard in the study area June–August and December–January. Changeovers at the nest are marked by "keep" series. Nestlings called in series ("peep," "keek," or "kee" notes) that often led into a trill series "dddd-bddddd-ddddt."

Breeding. Definite nests known only from September and December–January, but likely nests also June–July and October. Recently fledged young noted January, March, July–August, and December. Paired birds seen mainly December–January and May–July. Breeding seems to follow the rains in May–July, September–October, and December–March, perhaps preferring the last. Brown & Britton (1980) suggested

post-rains (dry season) breeding in this region. Local breeding is seasonal and rain-related, *contra* Winkler *et al.* (1995) and Winkler & Christie (2002). A Lesser Honeyguide juvenile may have come from that Cardinal Woodpecker's nest. Nests were in a fence post at *c.* 1 m, at 2.5 m in a stem-branch of a 4-m tall *Acacia gerrardii*, and at 6 m in a 10-m *Acacia gerrardii*; possible nests included one at *c.* 12 m in a tall croton and at the same height in a dead branch of a tall *Acacia xanthophloea*. The maximum number of fledglings seen with any pair was two.

Specimen data. We netted only two adult MM and a F and two juvenal MM. Compared with Nubian Woodpecker, much less often in net-lanes of our woodland sites, and not low when at such locations. Weights for all five were 21.3–27 g, the adult F being 21.3 and the two adult MM heaviest at 25 and 27 g. The M banded 11 July 1991 at MK was netted with the adult F, its presumed mate, 16 October 1992, in the same net at MK. These two gave the only measurable wings, though both worn, at 83 mm for the M and 86 mm for the F. Brown-eyed juveniles (adults all crimson-eyed; see Fry *et al.* 1988), both taken in January were fed by an adult M, possibly the same M (netted with juvenile 4 January 1986; bands not seen but with juvenile taken 10 January 1987). The 1987 juvenile had a distorted, elongated maxilla that we trimmed, but we could not adjust it such that the tips met. These woodpeckers are of the upland population of *D. f. massaicus* but tending toward *D. f. lepidus* in size and greenish yellow tinge of the upperparts (Fry *et al.* 1988, see also Short 1982, Winkler *et al.* 1995).

Bearded Woodpecker *Dendropicos namaquus*

Months. Resident where large trees present.

Ecology. The largest picid becoming less common over the course of the study; two-thirds of the records are from the first seven years, one-third from the last seven. Requires large trees for nesting and foraging, and these inexorably are becoming less numerous. Thus frequents riverine woods and woodlands, including degraded woods, and *Combretum* grassland where large trees remain (from firewood-gathering, removal of trees for construction, burning, and elephant-caused destruction). Feeds on trunks and branches of trees, especially where bark is flaking. Comes to bushes and small trees with dead branches. M debarks trees at times, using sideways peck-probing strokes. Both sexes excavate for beetle and other larvae. When feeding together as a pair M favors trunk and branches, F

tends to forage in small branches and large twigs, or may feed in a small tree beside the larger one used by the M (degradation lessens the habitat available for pair members to forage together). Does feed to ground level, and on fallen trees and logs. Larvae fed to the young may be split in two, the adult eating half. Flycatches clumsily; may flutter downward to secure flying termites. Occasionally suns in treetop. Seen drinking twice from water in tree crevice.

Movements. Sedentary. Forages widely away from breeding sites after nesting, even into bushland (which in 1960s was woodland or bushed woodland); seen once in GMF, in bushland, but heard from there five times. *Behavior.* Discussed by Short (1982), in Fry *et al.* (1988), and by Winkler *et al.* (1995), including displays of M-M, and M-F. Reacts often to Gray Woodpecker; chases occur. Usually its large size and long bill render it dominant to other woodpeckers. We have seen a dozen or more encounters of Bearded Woodpeckers with Scaly-throated Honeyguides, and three with Lesser Honeyguides, although we have no records of parasitism by these honeyguides on this woodpecker. One juvenal woodpecker even attacked a Scaly-throated Honeyguide. There were obvious nest-roost interactions of this woodpecker with Brown Parrots and Red-fronted Barbets, the woodpecker usually victorious. African Little Sparrowhawks thrice chased and tried to close with the Bearded Woodpeckers, perhaps involving "play" by the hawk, as the woodpeckers readily evaded them.

Voice. Territorial (long-range contact call as well) loud series calls are at times difficult to distinguish from those of Gray Woodpeckers. In general the loud rattling "wik" series is shorter, with longer individual notes at a slightly lower pitch; they often are slower, especially at the end, whereas the Gray Woodpecker's similar call usually ends in shorter, faster notes. When uttered in a more "wikka" form (see Fry *et al.* 1988, Winkler *et al.* 1995) as loud series calls they are distinct (as "week-week") from calls of Gray Woodpeckers. Both sexes give these calls, heard all year, but are more frequent May–September and November–February than in the other months. About half the calls heard were in May–August. Nestlings utter incipient wikka calls such as: "wa-eh," "wi-eh-eh," "tyew-ew," and "yeek-eek." Adults near one another give a low wikka twittering, and in flight, approaching one another, "t-chewi" notes. Both sexes drum loudly and much more commonly than the Cardinal, Gray, and Nubian woodpeckers. The drumming beats tend to slow toward the end, a "bd,d,d,d,da-da-dat," ter-

minating in one to five regular taps, and is heard all year, but most often in May–September and November–February. Winkler & Christie (2002) had drumming end in four (only) regular taps, but varies.

Breeding. Nests have been found May–September and November–February, and dependent young in all 12 months. One M at SI, banded 13 September 1989 as a full adult that had raised young that year (thus likely three years old or older) is known to have been: incubating eggs in June 1991 and feeding fledglings 10 August 1991; excavating a nest with its mate 1 July 1992; being followed by and feeding a fledgling 19 December 1993; feeding fledgling young 9 January 1995; and with an accompanying fledgling 3 February 1999, when it must have been at least 12 years old. We estimate that its mate (it had at least three different mates in this time) had laid in June, July or August, October, and November in four consecutive years, and in December 1998, indicating that a pair may nest in the May–September period in one year and the November–February period in another year. Courtship feeding was observed in March, May and December, and copulation seen in December and January. The F usually goes to the M who holds food, they call “t-ch, t-ch,” “tch-dd-dd-iiii” or “dddiii,” and he feeds her. Some November–February nestings may reflect nest failures in May–September attempts. Breeding thus occurs following the big rains into the period of the July–August rains, and following the little rains (there were seven nestings and 10 sets of fledglings for the former period, and six nestings and 16 sets of fledglings for the latter, with only four sets of fledglings in the other three non-rainy months). Winkler *et al.* (1995) and Winkler & Christie (2002) reported breeding only April–October in the region overall. Nests were at 1.3–17 m (mean 5.8 m, 11 nests) in trees such as *Acacia abyssinica* (five), *A. xanthophloea* (two), *Croton* sp. (three), and *Olea europaea* (one); one nest was in a large, broken-off branch hanging downward in an *Acacia abyssinica* and another was in an angled branch of a fallen dead tree of the same species. The clutch was two or three, with only one instance of three fledged young. Because each parent seems to take one fledgling under its care, and they forage separately, we could not always determine the number of young fledged. Unlike the Cardinal Woodpecker, a parent may escort a young woodpecker of either sex. During incubation some periods were considerably longer than noted by Short in Fry *et al.* (1988), namely to 103 min before change-over of a M by a F, and to 204 min before change-

over of a F by a M. As fledgling young become independent, interactions with the parents, and especially of fledgling MM with the M parent, become very aggressive as the M tries to display or at least approach its mate. Nonetheless, in some cases an immature remained with one parent for as long as c. three months after fledging. Since fledglings eventually must excavate, or find an old, unoccupied roosting cavity, the gaining of independence after starlings have ceased breeding, in October–March, is of benefit to the young woodpeckers.

Specimen data. We netted 20 Bearded Woodpeckers, 10 adult MM, eight adult FF and two immature MM. Some of these were netted twice, and a number were seen, as many as 13 times in the case of the 12-or-more-year-old Sipili M Pink/Dark Green mentioned above. The observations provided information on replacement of mates: at EG M Purple/Yellow was mated with F Purple/White in 1987, but she was not seen thereafter, and his mate in 1988 became F double Green. The 10 MM weighed 73–89 g (mean 81.8 g), and had wings 128–138 mm (132.1 mm, $n = 8$); the 8 FF weighed 70–80 g (74.3 g), and had wings 127–133 mm (130 mm, $n = 5$). The two young MM weighed 64.5 and 70.5 g (taken in January and February). The individuals appeared varying intermediate between *D. n. namaquus* and *D. n. schoensis* (e.g., some had black eye-stripe connecting to the malar stripe, others had these separated), but measurably they were closer to nominate *namaquus* (see Fry *et al.* 1988). Soft-part colors: Bill black with horn along tomia; gape pink, to black where meeting bill. Adult MM had deep (ruby) red eyes, those of FF were chestnut to red; the orbital skin is black in MM, dark gray to black in FF. Legs and feet are blackish gray, toe pads are yellowish and claws are black, except that one M had seven black claws and one white claw (on toe 4). Molting specimens gave June–November (once January) as the molting period, thus starts molting in early to mid-breeding; a F taken with her older fledgling offspring was completing her molt.

Gray Woodpecker *Dendropicos goertae*

Months. Locally common resident in well-wooded sites.

Ecology. Occurs mainly along Mukutan River and well-wooded luggas off it; more common than Bearded Woodpecker at S sites such as LU, PO, and NG, and about Center and Kutu. There are few records for PK and TA in the NW, but common in olive-croton woods of OD and in degraded *Acacia-Euclea-Olea* woods at NP. Seems to have become more common

in last half of the study period; 190 records 1992–1999 at the same 11 sites where 121 records were obtained 1984–1991, and at 10 additional sites (50 records) in the recent period. Forages on dead and live wood, tapping and probing, occasionally excavating for insects. Rarely forages on the ground for grubs (once for 35 min on a large “lawn”), and for termites after emergences. Takes adult moths. M feeds larger insects and their larvae to young than does the F. Feeds in bushes as well as trees, keeps in foliage, less often in the open than Nubian and Bearded woodpeckers. It forages rapidly and covers large areas of surface in a short time, pausing only at crevices, rough places and lichen clumps, then hopping or flying on. Occurs singly, in pairs, or family parties; sometimes two pairs may feed close by without aggression, and even approach one another (possibly one of them is a former nestling of the other pair), but usually aggressive and maintains irregular territories.

Movements. Sedentary; disperses along streams in riverine trees, also through woods and acacia bushland, does not move through other bushland, never seen or heard, e.g., at GMF. Appeared at MK and EG in 1989, none there earlier.

Behavior. Interacts with other hole-nesters, especially glossy starlings, Nubian Woodpeckers, Brown Parrots, and less often with Bearded Woodpeckers. A M attacked its image in a glass window at Center. Also interacts with Scaly-throated Honeyguides, and sometimes Lesser Honeyguides (is a host of the former honeyguide). Pairs engage in fluttering flight displays and M courtship-feeds F. Crest-raising, bowing and bobbing, swinging of the body and wing-waving are used in interactions and in M-F behavior (see Fry *et al.* 1988). Mobs Pearl-spotted Owlet with other mobbing birds. Occasionally suns in tree-top.

Voice. Well-known major call or song, a rather fast “wik” series, usually speeding up, but occasionally having a slower “kwik-wik-wik” ending. Wikka interactive call an often double-noted “t’weet, t’week” (or “ta-week”); between M and F, a “twee, t’wee,” “twee-twitta,” or “twee-tee, twitta” or softer a series of “tik” to “tch” notes, or “tcha, tcha.” Alarm call can be a “kli-kli-kli-klik,” or, from a bird in hand, a “kew-kew-kew.” An aggressive “chchchch” was given by a Gray Woodpecker at a Bearded Woodpecker. Nestlings utter variable calls: “ik-ik-ya-ik;” “tye-tye;” “chi-chi;” “yeep-yeep” to “pyeep-yeep;” and “tch-tch-ch-ch” (from tape-recordings) notes. The wings make loud, rustling sounds during encounters. Uncommonly drums April–August, a soft, fast “ddddd” that may

have c. 13 beats, given by M or F (see Fry *et al.* 1988); M also “signal taps” to F, a tap-tap, during displays between them. Flutters wings and taps with bill to playback of its voice. Is vocally identical to W Kenyan *D. g. goertae*.

Breeding. Breeds mainly May–September, with 27 of 32 definite nests in that period, peaking in July; of 49 adult-accompanied fledgling broods (one or two young woodpeckers or one young Scaly-throated Honeyguide), 34 were in May–September. Other indications such as occurrence of drumming, M-F displays including courtship-feeding, and copulations, predominantly are in April–August, with a slight peak also in November–February. Gray Woodpeckers in the study area breed after the onset of the big rains and through the July–August rains, and to a much lesser extent after the little rains (see Winkler *et al.* 1995, and Winkler & Christie 2002). Although fledging was not seen from all nests (nor could we reach most of them), at least five Scaly-throated Honeyguides hatched in Gray Woodpecker nests. In one case a pair that fledged a honeyguide in June re-nested, for they had a fledged Gray Woodpecker following them about the next January (thus they had a May and a November–December nesting). Note that the honeyguide, after fledging, begs loudly but does not follow its foster-parent woodpeckers, thus does not return to the nest to roost. This rapidly leads to the breakup of this “unnatural” family, the young honeyguide going its own way within two to six days. Nests are more often in live trees than in the other three wide-ranging woodpeckers. The trees, with number of nests, were: *Olea* sp. (14), *Acacia abyssinica* (seven), *A. xanthophloea* (two), *A. gerrardii* (one), *Croton* sp. (five), *Cassia* sp. (one), and unknown exotic tree (one). Significantly, none were in fence posts which Cardinal and Nubian woodpeckers use, although one was in an olive support post in the center of a Kuti house verandah. One nest was in an abandoned cavity that Nubian Woodpeckers used, and twice Gray Woodpeckers nested in the same cavity used the previous year. Nesting cavities (n = 31) were at 0.4–23 m (mean 5.0 m). Its ability to nest in partly live trees (also uses dead trees, but less so than Bearded, see Fry *et al.* 1988) and use of hard olive wood, with the usually neat, small entrance, help them to repel would-be usurpers of cavities, especially those larger than the Gray Woodpecker. Most cavity entrances have a diameter of 3.5 cm in the study area; irregular and large openings often show “biting” marks of Brown Parrot attempts to enter. Incubation, carrying of fecal

material from the nest, and feeding nestlings seem about equally shared by both parents. No more than two young usually fledge (once three). In cases in which both parents were observed, there were two fledglings nine times, one fledgling 10 times. Fledglings may follow either parent, regardless of sex, but a young M with an adult F encounters problems as it nears independence, the F commencing to strike at, and push away the fledgling M. By the time juveniles are assuming their first adult plumage, and the crown is more adult-patterned, both adult M and F are aggressive to them, particularly when the paired birds come together and interact. Sites such as PO, SI, and MB had two-three pairs within the site as circumscribed by honeyguide netting operations.

Specimen data. We netted eight MM, five FF, two immature MM, and two immature FF; one family of M, F and fledged young, one of each sex, was netted 1 October 1986 at LU. The MM weighed 47–57 g (mean 50.6 g), and had wing ($n = 6$) 104–111 mm (107.5 mm); the five FF weighed 46–51 g (48.5 g), and three had the wing 107–109 mm. The young MM were 48.5 and 50.5 g in weight, the young FF being slightly lighter, at 47 and 47.5 g. A mated M, hence likely two or more years old, banded 3 June 1990, was netted 30 April 1996, and thus was probably eight years or more of age. F Blue, netted as an adult 23 October 1986, likely was mated with adult M Red 1986–1989, but in June 1990 was mated to M White/Blue; she was at least five and probably seven or more years old by 1990. A M netted with its (M) fledged youngster was in mid-molt, so molt starts in the breeding season; molt was noted April–December. One adult F with her mate and two fledged young was in fresh plumage; apparently molt was arrested during breeding, as she had (symmetrically) new primaries 1–6, and old, worn primaries 7–9, with no molt elsewhere. All specimens, and all those observed in the field, had the moderately to very large red belly patch of highland Kenyan *D. g. rhodeogaster*; the study area and nearby are likely the source of wanderers to lakes Bogoria and Baringo (Stevenson 1980, Hartley 1986, Lewis & Pomeroy 1989). Soft-part colors: Bill black, paler at base of maxilla and gray at base of mandible; eye umber brown to red-brown, gray-brown in immatures (one adult M had iris blue-gray). Orbital skin varies, possibly seasonally, at least individually; in adult MM gray to fully pink, narrow orbital ring, in FF, pink to pink-gray or pink-green; and in immatures, pale fleshy pink (older) to slaty gray (younger). Otherwise as in Fry *et al.* (1988). We can

find no reason for separating Ethiopian *D. g. spodocephalus* and *rhodeogaster* from *D. goertae*, and indeed Winkler *et al.* (1995: 249) provided cogent reasons for retaining them in one species. They are alike vocally and both differ from *D. griseocephalus*, a red-bellied species with one race lacking the red belly (hence variable, too, in this character, see Winkler & Christie 2002).

Brown-backed Woodpecker *Picoides obsoletus*
Months. Uncommon resident.

Ecology. Occurs at NG, once seen in woods at SI and KS, four records for *Combretum* grassland upslope (NE) from ML, four more from PK, and one in TA woods. Its habitat is riverine woods, adjacent thickets, bushed woodland of luggas, and *Combretum* grassland. It feeds rapidly in dead or live branches and branchlets of various trees and saplings, including those of *Combretum* spp., *Canthium* sp., *Croton* spp., *Cordia* sp., and *Acacia abyssinica*. May back downward, also turns and moves forward down stems, tail raised off the bark; often hangs upside down. Skips large areas, pecking, tapping frequently, pausing at rough places, crevices and lichen masses. Excavates (Short 1982) frequently, but not for long, soon moves out of sight. May quickly clear bark off a place as large as its body; sometimes feeds within 0.25 m area of a branch, makes pits to 8 mm deep (smaller than those of Bearded Woodpecker) in places where it excavates regularly. One dropped from the branch of an *Acacia abyssinica* onto one of its flowers, taking insects (pollen, nectar possibly) from two of them: it can drop downward along a vertical stem with wings spread. Flies rapidly and somewhat zig-zag at times, from tree to tree in the open, as from *Combretum* to *Combretum*. One seen elaborately sunning after full stretching; perched crosswise on a branchlet, it briefly faced the sun with wings spread, then turned, erected feathers of the upperparts, and for 6 min let the sun onto the skin of the rump, back and nape. Its wings were spread and nearly touching the branch at the wrists (lifted to the rear, flight feathers up), and its head and neck were elongated forward with fluffed, erect feathers. Joins mixed-species flocks.

Movements. Presumably resident.

Behavior. Little known (Short 1982, Fry *et al.* 1988, Winkler *et al.* 1995, Winkler & Christie 2002), interactions obscured by movements often so rapid that crown markings not seen, thus sex not determined. One rattle-called at an interaction between a pair of Cardinal Woodpeckers with a Nubian Woodpecker.

Brown-backed Woodpeckers interact with rattle calls. *Voice.* Little known, and we provide notes on the sparse calls heard without trying to fit them all into the framework Winkler & Short (1978) gave for the genus *Picoides*. Rattle calls are like those of Downy Woodpeckers *Picoides pubescens*, but faster, e.g. a “brdd-dd-dt.” Apparent contact call is a “ter, ter” to “ter-a, ter-a, ter-a.” Wikka-Kweek calls (Winkler & Short 1978) are more variable, from a high “wee-wee” to “kweek-kweek” (see Fig. 23 A in Winkler & Short 1978), as well as series of “k’li, k’li” to “te-ree, te-ree” (or “t’ree, t’ree”) notes. Often but one individual was seen, although two birds called, then both would disappear.

Breeding. A nest at 5.5 m in the dead horizontal branch of a large *Acacia abyssinica* standing alone in the center of a maize field at NG 11 March 1976 contained begging nestlings, fed by the M and F. Three at NG 24 October 1987 may have been a family group. Lone juveniles seen 17 May, 8 July and 12 September at NG and PK indicate earlier breeding in each case. A lengthy breeding season of February–September is suggested by these data. Apparently this is the first breeding record N of the equator in Kenya (Lewis & Pomeroy 1989).

ALAUDIDAE Larks

Singing Bushlark *Mirafra canillans*

Months. Late May–July, September–October; irregular breeding visitor.

Ecology. Visitor, seen in only five years, including a 1968 record by Sassoon, Start, Start, and Horne, only locally common in 1991 and 1992, when occurred from the NW (PK) to SE (LU) of the area in degraded bushed grassland, and degraded woodland and bushland about luggas, including areas that had been burned in the 1980s. Forages on bare ground and in grass (for foods see del Hoyo *et al.* 2004). The 16 records were at 1600–2000 m, above the range given by Lewis & Pomeroy (1989) and Stevenson & Fanshawe (2001).

Movements. Known to be migratory in part (Lewis & Pomeroy 1989, Keith *et al.* 1992), occurring at nearby Lake Baringo April–July. All but two records from the study area were May–July, within and after the big rains. The paucity of records at other times implies movement into the area in at least 1990–1992.

Behavior. We elaborate on its flight-song behavior (see Keith *et al.* 1992). Sings in bushes, and equally commonly on the wing. Aerial songs uttered after M

climbs to *c.* 50 m and either flies along a loosely straight line, or in a circle with stilted wings as it sings; continues in the air for up to 10 min, singing sporadically. At the end of an aerial bout, the lark drops with wings held in a shallow V, breast forward and appearing fluffed, and lands in a bush with its tail cocked.

Voice. Song from perch or in air a usually short mixture of buzzy, warbled and chirping notes, e.g., “zee-weeez-zee-weeezy-wee,” “tzee-tchee-tzee-chee-chee-chee” (both from same M), and a “tseep-seep-zere-eeep-zeep.” Some vaguely resemble songs of the Red-faced Sylvieta.

Breeding. There is little evidence for breeding, mainly extended singing and aerial display flights May–July, and two observations of adults carrying insects. One went up the lugga slope bearing a large greenish larva at MB 19 July 1991, and one carried an insect up the far E slope of GMF hill 15 July 1992. Brown & Britton (1980) gave breeding in the region as April–June. It is unlikely that the lark would appear in some numbers to sing extensively upon territories in the big rain period for other than breeding purposes.

Rufous-naped Lark *Mirafra africana*

Months. All but October; probably locally resident.

Ecology. Irregularly common and widespread in short grass, degraded bushland, and degraded wooded and bushed grassland with grass tussocks and some bare ground but dead or live bushes (or termite mounds, or fence posts) present as song perches. More common since 1989, following several years of burning of large parts of the study area. When present in numbers, throughout the more open areas from pastures and even fields of dead beans about the Main Gate, NG, and LU to PK, TA, NP, and bare areas about Kuti Hill. At NP (Fig. 7) foraged in bare earth beneath *Datura stromonium*; near MB in and about an old, abandoned manyatta (abandoned huts, surrounded by thorny branches).

Movements. Likely resident, at least in some years (e.g., dry 1993), and locally, as at the large pasture N of Main Gate, but mostly an irregular invader for breeding in dry years and after burning. Most common April–September; present only three-four years in December–January.

Behavior. Sings during flight display much less often than from a perch (possibly influenced by more common, flight-displaying Flappet and Fawn-colored larks). When displaying, flies slower than normal, usually flying up to *c.* 40 m, then flying in a line or circle (in

line to 200 m or so), singing every 20–30 m. Two MM may sing in parallel aerial displaying, presumably over their separate territories. Does not remain in the air as long as do the two larks mentioned above. At the end of the flight, drops with breast feathers erected, wings in a V, to a perch. The flight during displays is stilted; the bird appears to be laboring greatly as it flies. Such displays not noted by del Hoyo *et al.* (2004).

Voice. We discussed “song capture” of the song of a Montane Nightjar, appropriated and used exclusively as its song by a M Rufous-naped Lark about GMF and MB (Horne & Short 1998); see also Keith *et al.* (1992) for discussion of this lark’s repertory. The common song is “sweet Mary,” whistled, in three-four notes. “Pee-wit” alarm and “pseet” call notes have been heard. The aerial song of *c.* 6 notes is rendered “chee, choo, chee, chee, chee, chee” in at least one version. About 86% of songs were heard April–July.

Breeding. Other than most singing occurring April–July, we have no definite breeding. Most records of Brown & Britton (1980) were in March–May (big rains) from our general region, likely lacking records from triple-rainy-season localities; probably breeds April–August in average-to-low-rainfall years. We had little time to seek open-country lark nests.

Flappet Lark *Mirafra rufocinnamomea*

Months. Common though inconspicuous resident except when displaying.

Ecology. Ubiquitous in bushed grassland, degraded, open woodland, and eroded luggas with patches of grass and bushes/trees present. Resident, “flappeting” (equivalent of song, noisy flapping of wings in precise pattern over territory) heard year-round. Habitat as for more abundant Fawn-colored Lark, but averaging more bushy or wooded. Tends to “creep” about, less often in the open, perches less often on bush or tree (and rarely on fence-posts and wires) than does Fawn-colored Lark. Walks about, pecking and probing for insects in grass-clump bases. Sometimes joins mixed-species foraging flocks.

Movements. Resident, probably some local movement as usually one territory, but sometimes to three territories, about GMF. It was seen regularly to 2000 m, above the 1800 m allowed by Stevenson & Fanshawe (2001).

Behavior. Flappeting display flights (see Keith *et al.* 1992) reduced to a few early in the morning when not breeding, much more frequent and sustained when breeding; all-day displaying after rains. Dis-

playing MM in breeding period may fly in parallel, each on its territory, “counter-flappeting” at each other. May climb to over 100 m, displaying path in a line or circle, ending with a vertical dive, usually to the ground. Rarely displays at night; when breeding, however, frequently displays pre-dawn, as early as 05:00 h, but not beyond dark (to *c.* 19:00 h). M seen with F on ground had head and especially crown-crest feathers and neck feathers erected, those of neck in ruff, as it bounced about the presumed F. Several fights have been with the Fawn-colored Lark.

Voice. Flappet Larks in the study area “flap” in their aerial displays in one dialect (see Keith *et al.* 1992), with two or more often three short, then one long burst, “bddd-bddd-bddd-bddd-bddd-bddd-bddd.” The sound seems ventriloquial; the flying, displaying lark is more difficult to see than is the aerial-displaying (singing) Fawn-colored Lark. Often the flaps seem close overhead, but the bird proves to be 50 m or more above the observer. Up to 30 flappeting “songs” may be produced in one display flight, whereas, when not breeding, may display once or twice a morning, giving only one-three flappets. In addition to the flappeting sounds, also engages in wing-snapping, louder sounds, when two MM are displaying relatively close to one another. One unusual series of flappet-sounds occurred 12 July 1994 at PK. A M flew from the top of a bush to a tree 20 m away, flappeting en route; after perching, it flew to another bush, again flappeting as it flew; from the bush it then flew, flappeting en route, to a small tree. Flappeting was heard most frequently April–July, with another peak in December–January. Actual songs are much less frequently uttered from the ground or a bush; we heard them May–July, once in September, and in November–January. Songs heard were simple, a “twee-zee-eee-ee,” and “tsee-chee-wee-chee,” apparently the first song type given by Keith *et al.* (1992), but not only during flappeting, for we viewed the singer several times perched in a bush. It does not end flappeting aerial display with a song (see Maclean 1993).

Breeding. Other than songs and flappeting as indicative of breeding April–September and November–February, evidence consists of: a three-lark family including a weakly flying immature 8 June at UL; a nest relatively in the open E of Kuti, containing three eggs (flushed from it, not closely approached by us), 14 August; and an adult with a begging, bob-tailed fledgling E of GMF on 2 February. These indicate that breeding occurs April–August and December–January, i.e., during and between the big rains, July–August

rains, and following the little rains. This seasonality agrees well with Keith *et al.* (1992) for regions “C” and “E” in East Africa; there were no data (see Brown & Britton 1980) for region “D” (these regions were described by the latter authors), at the edge of which is our study area.

Fawn-colored /Foxy Lark *Mirafra africanaoides*

Months. Ubiquitous resident of bushy open areas.

Ecology. The abundant lark, ubiquitous, in mixed bushland and grassland, edges, low grassland with bushes nearby, and open woodland; likes bare ground near bushes, hence degraded habitats are well-occupied. Also extends into woodland, as at SI and MB when dry. More often in open than is Flappet Lark, and is less retiring. At times forages with pipits *Anthus* spp., and may join mixed-species foraging flocks. Foods are given by del Hoyo *et al.* (2004); during emergences of termites may run about after them, and even hawk them in the air. One of the most numerous species, found at all sites, and along roads throughout the study area, to 2000 m (Stevenson & Fanshawe 2001 gave 1800 m as its upper limit).

Movements. Is resident, may leave the area in part during droughts, but movements likely are local, if any.

Behavior. Interacts with pipits, *Anthus* spp., one seen fighting in road with a Flappet Lark. M in floppy “butterfly” flight over F on occasion. Flips wings during aerial singing flight, flapping sound may be heard, chest forward at times; dives downward or “falls” at end of flight, chest out, undertail “fluffed,” feet going up-down – lands with wings flicking and tail cocked. Flight displays with songs are in small to large circles with exaggerated wing movements; adjacent MM on territory may fly parallel to one another. When singing from a perch the M flicks its wings; when counter-singing the M leans forward, almost bowing, beating its wings as it sings, and pumping its tail trying to keep balance. An adult with a bob-tailed juvenile flew at us with “whooshing” wing sounds, then dropped to the ground and for 90 s hopped and walked in small circles giving a broken-wing distraction display. For other behavior see Keith *et al.* (1992), and del Hoyo *et al.* (2004).

Voice. Aerial songs-displays during circular or linear flight, songs at irregular intervals, flights to *c.* 7 min; sang a mixture of clear and noisy notes (e.g., “sweet, sweet, jirrr, twee, tt-tt-eeee”), heard from before dawn onward, and at intervals during the day when breeding. Over the years sang in flight displays in every month. Songs from perch in bush or tree, even

top of a large *Acacia abyssinica* in open woodland at SI, of more melodic, fewer noisy notes, as: “deet, deetle, deet-deet-deetle-dee;” “chee-cha-wee-chee-chew;” “tee-dee-dee-dee-eee-it;” and, “sweet, sweet, sweet-wee-wee” (see Keith *et al.* 1992, Maclean 1993, del Hoyo *et al.* 2004). They responded to playback of their song with more continuous series of clear, short songs. Adult giving distraction display called “sweet” a number of times.

Breeding. Likely can breed in any month, depending upon rains; in wet years, i.e., 1996, breeds in big rains, ignores July–August rains (no singing), and may breed again October–January, during and after the little rains. One nest with three young in December had them lost to a snake (“tracks” seen), fledged young seen with adults January–February, June–July, and September, adults carrying insects about January–February, April, June–July and September. Aerial displays, pre-dawn and intensive singing, and chases, with above data, suggest breeding during and following all three rainy seasons. Bob-tailed young, recently fledged, can glide and “fly” *c.* 20 m.

Specimen data. Two chasing MM taken 12 May, and three other adults netted 1 May, and 10 and 12 July. Weight: (n = 5) 22–25 g (mean 24 g), the two MM at 24 and 24.5 g; wing: (n = 4) 87–93 mm (90.4 mm). The two chasing MM had a cloacal protuberance, very large in one that was not molting except for the first rectrix, and small in the other, which was in early wing and tail molt. The one other May lark also was completing its molt (the first rectrix was worn on one side, out on other side). The race is apparently *M. a. intercedens* (Keith *et al.* 1992); variation is considerable, as in black versus brown arrow-markings on the breast, extent of the black line through the eye, and other markings, only partly relating to the molt. These variations occur in both rufous and brown “morphs,” depicted by Zimmerman *et al.* (1996) and Stevenson & Fanshawe (2001) as differing mainly in rusty or brown tones. Put in *Calendulauda alopec* by del Hoyo *et al.* (2004).

Red-capped/African Short-toed Lark *Calandrella cinerea*

Months. February–July, September, December; local, probably resident.

Ecology. Restricted to short-grass areas, about Center, Big Dam, and Nglesha, and especially the pasture area N of the Main Gate, and the main airstrip. Favors sites of mixed bare ground and low (overgrazed) grass

in patches, even within low-grass situations. Forages singly, in pairs or family groups, or small flocks. We rarely saw this lark, as we infrequently stopped in such open habitats as it favors. Sassoon (pers. comm.) has seen it about Big Dam. It is common about lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986) and on the Laikipia Plateau E of our study area (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996; at Mutara by Olson *et al.*, undated MS, and Pinguone Ranch, Schulz & Powys 1998).

Movements. We were not in its habitat sufficiently often to detect these.

Behavior. Seen in aerial displays, singing, in May–July. The display involved flying in buzzy flight (wings beating strongly and slowly) into the wind for 100 m or more, then curving rapidly back to *c.* its original starting point, and turning again into the wind, beating heavily, etc., for up to 9 min, singing during the slightly upward, into-the-wind stages. Series of these movements and songs ended with one or two partial dives, then a drop to the ground or just above it (if the latter, it climbed back upward to display again). The flights were at *c.* 50 m above the ground.

Voice. During aerial displays a more or less continuous, chittering song, sometimes melodic, a “pee-per-pee-tee, cheek-chit-chit.” Calls heard were: “tzweep,” “pree-yewp,” and, at us when near its nest, a “chip-chip,” sharply double-noted. Songs were heard only when the presumed MM were displaying in the air.

Breeding. One nest found at the airstrip 10 July 1994 contained two well-developed young (black skin, straw-colored “puffs” of feathers scattered about the body), and was empty on 17 July. The two presumed parents called excitedly and ran and flew close to us on 17 July, suggesting that the young had left the nest successfully. The nest, which we photographed, was of fine rootlets and grasses at the edge of a bare patch with a short tuft of grass beside and partly over it (see Keith *et al.* 1992, Tarboton 2001, del Hoyo *et al.* 2004). Brown & Britton (1980) considered it a “rains” breeder in our region, during February–July, and also November–December.

Fischer’s Sparrowlark/Finchlark *Eremopterix leucopareia*

Months. March, May, July, September; regular visitor, conceivably resident in far E.

Notes. Seen mainly in the barren area about the Kuti cattle dip, and also in bare roadside near Center (March 1976) and by Sassoon (pers. comm.) in the open area near Big Dam (September 1982). It is fre-

quently seen E of the study area in the farming area of small-holdings, in or beside the road, and noted at 2050 m just S of the Main Gate, coming from the Ranch to the SE, in flight (a pair, 29 May 1994). Favors bare areas with very sparse grass, apparently throughout the Laikipia area (E to Pinguone Ranch and farther, Schulz & Powys 1998), but noted only to 1800 m by Lewis & Pomeroy (1989) and Zimmerman *et al.* (1996), although Stevenson & Fanshawe (2001) had 2000 m as its upper limit. Areas where it has been seen along the E boundary, and about Main Gate are over 2000 m; the other sites are 1800–1900 m. Except for the pair noted above, seen in groups of four–20 or more, those in July and September in mixed plumages and likely in post-breeding, annual molt. It breeds in the region February–July and December (Brown & Britton 1980; see van Someren 1956). We observed no dependent juveniles, so have no definite breeding indication for the study area.

HIRUNDINIDAE Swallows, martins

Black Saw-wing *Psalidoprocne holomelas*

Months. Relatively common resident and moves locally.

Ecology. Usually in pairs and small groups of up to 18; at times in July–September greater numbers occur, up to 100, but only loosely together. Prevalent in valleys along riverine woods, at times foraging over bushland and water, and rarely flying high along storm fronts with swifts and other swallows. At one time or another observed at virtually every site in the study area, even over scrub and pastures (especially after breeding when vegetation is lush). Forages in slow twisting or circular flight just above the canopy or at *c.* 10–15 m over non-wooded areas. Congregates about termite eruptions, often with other swallows, especially Red-rumped. Agile, swoops into small openings in forest and woodlands. Occasionally drinks at dams, dipping bill into water. Away from habitations it is usually the commonest swallow, except for Barn Swallows in October–April.

Movements. Less common in dry periods, indeed almost absent during droughts, except at NG, where it is resident. Numbers are always less in November–March, when some likely move upslope to the S.

Behavior. Pairs interact and members of a pair sometimes fly side-by-side in stilted flight, the long tail often spread, during April–September (once in November.) Chapin (1953) observed pursuits (“courtship”), the pursuer flying with stiffly beating wings

held below the horizontal. Chases were more frequent than side-by-side flights. We observed at least six cases of courtship feeding, one bird (M, presumably) passing an insect to another as they flew beside one another. These were seen in May–July. The chases in some cases may be inter-pair aggression.

Voice. In a three-bird chase, grating notes were heard, as of running finger nails along comb. Also heard, a soft “wheeee” to “tseeew,” and a “growwp” call, recorded on tape. The apparent song is a twittering “tsee-tsee-tsee-tseeew,” or “tsee-eee-eee-ow” uttered while flying and displaying (see Keith *et al.* 1992, Maclean 1993).

Breeding. Breeds April–August, active nests in holes in banks of streams or erosion channels of dams (nesting in four years in Mukutan Valley and at Lugwagippe, near the dam). Likely nests in dam walls at Big Dam and possibly Dirty Dam. In 1985 (Short & Horne 1985) three nests were excavated at MK and in 1994 three were found at LU in banks 3–5 m high, excavated by the swallows. One nest dug out at MK 30 August 1986 because it held a dead adult near its entrance was c. 38 cm deep; there were two old, broken eggs in the chamber at its end. This nest probably was abandoned in July, the adult having died (and dried out), following a wing injury. Semi-colonial nestings probably were the exception (see Tarboton 2001); most breeding likely is in pairs at less conspicuous sites than these open streambanks (del Hoyo *et al.* 2004).

Specimen data. Seven taken in nets at MK, TA, CS and PK in March, May, June (two) July, and August (two). Six adults weighed 10.5–13 g (11.4 g), an immature weighed 10 g. Wings showed diverse wear, especially in nesting adults; three in June–July measured 111–116 mm, three others were 97–103 mm (some perhaps FF). The specimens are of the highland race *P. h. massaica* (see Keith *et al.* 1992); the glossy green-black head is the darkest part of the plumage. The fledgling (27 August 1993) was browner, less glossy and greenish than adults, with a yellow gape and flange at the corners of the gape. The orbital skin is dark gray. Unfortunately we did not notice the sexual difference in the outer primary (rough-edged) mentioned by Turner & Rose (1989), and noted by Keith *et al.* (1992) for the genus *Psalidoprocne*, but not cited by them in their accounts of the species of saw-wings and sexual difference in each species. One photographed shows the 18 June 1990 adult to be a M by this feature (wing 115 mm).

Brown-throated/African Sand-Martin *Riparia paludicola*

Months. April, September, November; casual.

Notes. Sparse, apparently not breeding locally, as not found about banks and seen only in very small numbers. It occurs on the Laikipia Plateau to the E (Lewis & Pomeroy 1989, Schulz & Powys 1998), occasionally at Lake Baringo (Stevenson 1980) to the W, and also at Lake Bogoria (Hartley 1986). Seen in the study area by Horne, Sassoon, and party 4 September 1968. It may be under-represented with our four records, but all parties of brown, small swallows have proven to be Sand-Martins *R. riparia*.

(Common) Sand-Martin/Bank Swallow *Riparia riparia*

Months. October–January; occasional visitor from Palearctic.

Notes. Frequents lower elevations (Keith *et al.* 1992) than in our study area, but seen occasionally to 2000 m (dams along S boundary of study area). As few as four observed (with one Brown-throated Sand-Martin) about the glade and bushy slope at EG 22 November. Most often seen over Big Dam, where more than 50 were noted 3 December 1994; over 50 also seen S of PO (near dam S of the study area) 15 January 1994. Abundant at times W of the area at lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986, Lewis & Pomeroy 1989).

Banded Martin *Riparia cincta*

Months. April, June–January; uncommon visitor, could breed about NG.

Notes. Usually observed in numbers to four, but 12 September 1995 over 50 flew about Nglesha Dam and many more (50+) were flying about the open fields and pastures at NG. Observed to the N above Python Pool (Maji Nyoka) in the Mukutan Gorge, and flying E over OD woods. Other than these sites, we observed Banded Martins about Big and Lugwagippe dams, and once over MB, heading perhaps to Titus Dam. Seen perched on fence wires frequently, and noted with foraging Barn Swallows and Western House-Martins three times in August–November. It occurs on the Laikipia Plateau E of the study area at Mutara (Olson *et al.*, undated MS), and might be expected to breed (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996), but the study area may be too wooded for it, except about Nglesha; may breed in the largely open area of mixed cultivation, low bushland, fields, pastures and dams just S of the study area.

Mosque Swallow *Hirundo senegalensis*

Months. All except October; one-quarter of c. 125 records September–March.

Ecology. This large swallow may be resident but its conspicuousness and sparse records September–March suggest at least local movement out of the study area. It is found from Lake Bogoria (Hartley 1986) across the Laikipia Plateau to Pinguone and elsewhere (Lewis & Pomeroy 1989, Schulz & Powys 1988), wherever there are trees. Often present in woodlands in pairs (two–four birds), and only occasionally in numbers. Cruises slowly while foraging in woods; occurs away from woodlands at times, as at Center and once at GMF with Red-rumped Swallows. Seen drinking at a tree crevice and observed catching flies over dead buffalo in open grassland of an airstrip. Often seen flying about tree cavities, even when not nesting.

Movements. Its sporadic absence from some sites, given that it is very conspicuous, suggests that it moves away in some years.

Behavior. Seen flying in apparent display with a feather (of the Egyptian Goose) in April and July; a high circling display of a pair flying in tandem also was noted in May, neither mentioned by Turner & Rose (1989), Keith *et al.* (1992) or Maclean (1993). Use of tree cavities causes interactions with other secondary cavity-nesters, starlings, and wood-hoopoes.

Voice. Distinctive calls have been heard in all months but March and October. Typical call a nasal “neent” or “kreee-eeek” or “preeeng.” The song may be somewhat melodic (“hweeee-kwa-kwa-kwak,” or “plee-uk-ttt” or “kreeeeeee-ka-ka-ka”) or more trilling (as “kleeklik-ik-ik”). Uttered from a perch near a prospective nest site, the delivery seems to be with bill opened wide and snapped shut at intervals (see Maclean 1993).

Breeding. Active nests have been found May–July, so breeding is during and after the big rains (Brown & Britton 1980; del Hoyo *et al.* 2004 give only April–May and December). Nests mainly have been found in trees at SI and NG, but one pair nested in a shed for aircraft at the main airstrip (May 1994); the latter was an incomplete (open-topped) mud cup above a wooden brace at 3.5 m up. The seven tree-cavity nests were at 5–9 m in *Acacia abyssinica* trees, all but one dead, usually in a split branch, the split forming a cavity. It also uses old woodpecker cavities in non-vertical stubs. In one split branch an old mud nest could be seen below, with the new mud mass (retort) projecting out of the top of the slit. One nest-branch

broke and fell, killing the nestlings. Once fledged, the adults and young depart from the site and feed generally about the wooded surroundings. Both sexes carry mud to build the nest and both feed the nestlings.

Specimen data. These swallows forage above our usual (2.5–4 m) net level, and but one was netted, a 49.25-g non-molting adult with a wing of 148 mm (*H. s. saturator*, tail with but a trace of white marks). A short-tailed, well-feathered nestling killed when its nest-branch fell had been dead for perhaps two days; its chin was spotted, it had a gape flange on each side, rusty tips of uppertail covert and tertial feathers, and differed from the Keith *et al.* (1992) description in the brown breast band being barely complete in the front only.

Lesser Striped Swallow *Hirundo abyssinica*

Months. February, April–September; scarce and casual.
Notes. Only about 10 records, odd with its occurrence to the W (Stevenson 1980, Hartley 1986) and E (Lewis & Pomeroy 1989, Schulz & Powys 1998) of the study area. The lack of bridges, culverts and habitations, plus presence of Red-rumped Swallows about the buildings may be factors in its sparse occurrence. Except for sightings at High Boma and TA, those seen were about buildings, mainly at Center, where five or six persisted in singing and courting in May 1994 and August 1989; these may have tried to breed. We have observed replacement of this species by Red-rumps, and vice versa in nesting at buildings elsewhere (Ruiru), so this may be one reason. Also observed in the area by Horne, Sassoon, and the Starts 3 September 1968.

Red-rumped Swallow *Hirundo daurica*

Months. All but March, absent some years September–March; mainly near buildings.

Ecology. Associated with habitations but less restrictedly than Wire-tailed Swallow. Occasionally seen foraging about dams and most sites (not in woodland). Regularly associates with other swallows, and sometimes swifts (*Apus* spp.). Flies gracefully but slowly, at various heights. Rarely feeds on ground after termite eruption, grits on bare ground. Usually in numbers of four to 10, sometimes in large flocks after rains. Drinks from dams and water in tree crevices and knot-holes. Forages closely over flowering, insect-attractive trees such as *Apodytes dimidiata*. Foods given by del Hoyo *et al.* (2004).

Movements. Numbers and occurrence fluctuate widely year to year, often absent September–March. Large

numbers seen briefly after rains come from elsewhere. *Behavior.* Sings May–July (Keith *et al.* 1992). Gathers mud for nests late April–late July.

Breeding. May–July or August, possibly rarely in December–January, in big rains and July–August rains mainly. Most nests about sheds, garages and unoccupied buildings at Center, Nglesha and Kuti, but also at airstrip and GMF sheds and buildings; builds below rock ledges about Mukutan Gorge, seen entering rock-crevices as late as 18 August. Fledged young observed July–August. We never saw more than two nests in a single (large) shed, so pairs spaced out, and no more than four pairs seen about a breeding site. Families seem to leave the nest areas by September.

Specimen data. An apparent pair taken at GMF 12 May 1995 included a likely adult M (23.75 g, wing 127 mm, race *emini*, Keith *et al.* 1992) and a likely F that was subadult (weight 23.5 g, wing 113.5 mm). The subadult was paler below showing very fine, vague streaks (breast, sides), the rump was much paler (buff), ear coverts were duller, the tertials were buff-tipped, secondaries brown (lacking any gloss), and the uppertail coverts were browner. Neither was molting, although the F was replacing its left outermost rectrix. The M had a nearly complete rufous collar; the central nape was mixed blue and rufous (see Turner & Rose 1989, Keith *et al.* 1992, del Hoyo *et al.* 2004).

Rock-Martin/African Rock-Martin *Hirundo fuligula*
Months. All, likely local resident.

Ecology. Found mainly around rocky slopes of Mukutan Gorge, nearby luggas, at PK, and about Nglesha, but occasionally over woodland, bushland, and habitation. Forages at rock faces, also in woodland edges, flying up under the canopy in the manner of saw-wings. Sometimes forages high, as over High Boma, and among other swallows and bee-eaters. Usually in small numbers (up to seven); maximum seen, 13, at EG 31 December 1993. This swallow and the Red-rumped Swallow are those most often seen among resident swallows after saw-wings.

Movements. When not breeding, forages widely but locally.

Behavior. In pairs when breeding, circling together, flitting, spreading tails and darting to underside of rock ledges.

Voice. Harsh “dzhit” calls have been heard from birds flying about rock faces.

Breeding. Likely mainly in June–July, when regularly at rock faces as at LA and in the Mukutan Gorge. Nests under ledges high above Maji Nyoka in the

Mukutan Gorge, and inside the lip of crevices in a sloping rock face at LA in June–July. Nests not observed closely. Is a breeder in the rainy season (Turner & Rose 1989, Keith *et al.* 1992), occurring widely on the Laikipia Plateau (Lewis & Pomeroy 1989, Schulz & Powys 1998), and along the Rift Valley at lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986) to the W.

Specimen data. One fresh-plumaged adult without a brood patch, and showing no molt; not weighed, wing length was 112 mm, and it appeared to represent the East African race *fusciventris* (Keith *et al.* 1992). Put in *Pryonoprogne* by del Hoyo *et al.* (2004).

Wire-tailed Swallow *Hirundo smithii*

Months. All but October, March; few resident Center, yearly breeder at Kuti, Nglesha.

Ecology. Present yearly dating back through 1960s (Horne), few seen occasionally away from buildings at dams, NP, High Boma, LA. Mostly forages flying rapidly rather low about fields, pastures and buildings. Drinks at dams. Perches on and in buildings, even small, occupied huts, and on parked vehicles. Up to three pairs about Center, only occasionally are more than six observed together. No movements noted, forages with passing flocks of swallows; perches but does not often feed with slower, more numerous Red-rumped Swallows. A common resident on the Laikipia Plateau (Lewis & Pomeroy 1989).

Behavior. Effectively attacks and chases domestic cats; may fight one another if perching too near (three pairs at Center nested 70–100 m apart and tend to forage apart). Pair roosts about nesting site after breeding (Turner & Rose 1989).

Breeding. April–September and also November–December, three broods raised in some years. Nests on side of rafter or over window in buildings; nested in tiny occupied hut, nesting over a window or on the upper wall, entering a slit over the door when door was closed. Pairs nested in separate buildings at Center. Old nests re-used in part the following year, rebuilt with mud pellets. Fledged young seen June–September and December.

Specimen data. No birds netted, but two adults watched closely as they fought foot-to-foot; both had yellow-pink at the base of the bill, and white edges of the primaries and secondaries (fresh-plumaged adults; these colors not noted or shown by Turner & Rose 1989, Keith *et al.* 1992, Maclean 1993, Zimmerman *et al.* 1996, Stevenson & Fanshawe 2001, del Hoyo *et al.* 2004).

Ethiopian Swallow *Hirundo aethiopica*

Months. January, February, April–July; casual visitor.

Notes. Generally occurs at elevations lower than in the study area (mostly below 1000 m, Lewis & Pomeroy 1989), though present at sites on the Laikipia Plateau to the E and N (Zimmerman *et al.* 1996). Stevenson & Fanshawe (2001) reported it to 1900 m; we have seen it feeding over High Boma (2000 m). One to three seen at several sites alone or mixed with other swallows such as Barn Swallows and at least four times at Center (16 January, 2 February, 4 and 18 July), all pairs. One of a pair sang on a wire at Center 16 January 1989. Otherwise we have not seen them lingering about habitations, nor has anyone else, although S. Sassoon reported verbally having seen this species in the study area sometime during the 1980s.

Angola Swallow *Hirundo angolensis*

Months. June–September of four years, sporadic visitor.

Notes. Although the study area is at the E end of the range of this highland species (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996) it extends beyond our area to Nanyuki; there is one June record from Mutara, to the E (Olson *et al.*, undated MS). Seen mainly at Center, three to six individuals, especially through June–July of 1987, but *c.* 70 at High Boma 6 July 1990 with a few Ethiopian and Wire-tailed Swallows. Observed 3 September 1968 by Horne, Sassoon, and the Starts. Four at Center 18 July 1989 were near several Red-rumped Swallows and two Ethiopian Swallows. A distinctive swallow usually found about buildings, we are not apt to have missed noting it, so those seen presumably were wanderers.

Barn Swallow *Hirundo rustica*

Months. All, usually ubiquitous visitor from the Northern Hemisphere August–April.

Ecology. Outnumbers all other swallows combined during most of the year. Forages in the open, and over all habitats, from within a few cm of the ground to 200 m or more. Rapid and agile, it is highly successful, although currently decreasing in parts of Europe. Often zips over and disappears, but gathers in feeding over large mammals, dams and carcasses, as at lion-killed buffaloes. A well-defined pattern of movement locally is from W to E mornings up the Mukutan River and associated luggas. Seen August–November and February–April (when northward migrants may be involved). These may come from roosts about Lake Baringo (Stevenson 1980), where many thousands may

occur. Numbers 07:15–08:45 h totaled 300–500 and occasionally 1000. By 09:00 h they were all over the study area. Return W in the evening was not pronounced; they drifted back gradually or, by 18:30 h, rapidly to the W. At times 100 or more roost in trees along the wall of Big and Dirty dams. Attracted to any burning in numbers, the swallows feed over the flames, often in February–March (dry season).

Movements. Extreme dates are 3 June 1995 and 4 July 1992, giving one month in which none was observed; Stevenson & Fanshawe (2001) mentioned that a few remain all year. We were not present continuously so as to be certain of arrival-departure dates yearly; in six years that we were present April to June, dates when last seen varied from 13 April to 3 June (three in April, two in May, one in June), and initial sightings for the year for 10 years in which we were present mid-June to mid-August, varied from 4 July to 19 August (seven initial sightings in July, three in August). They usually become common *c.* two weeks after the first sighting (e.g., 9 July 1991, in numbers 20 July 1991), and are common through the first week of April. In some years common throughout the overwintering months, but in other years, especially very dry ones, only small numbers are encountered January–March. We note that boreal spring and autumn migrations essentially overlap in late June (migrants February–late June) and early July (migrants early July–December) in Egypt (Goodman & Meiningner 1989).

Specimen data. One immature taken at GMF 1 November 1992 had a mixed-colored breast band and brown in the crown, the throat was buff-white and it was very pale below; weight 16.5 g, wing 128.5 mm. Immatures have been observed as late as March (they molt following autumn migration, Cramp *et al.* 1988). One, possibly an immature of Egyptian *H. r. savignii* near GMF 13 November 1992, was deep chestnut-rufous below with a partial blue breast band, seemingly too dark below for *H. r. transitiva* of SE Europe (which reaches Kenya, Turner & Rose 1989).

Western House-Martin/Common House-Martin *Delichon urbicum*

Months. All but June–August; often common visitor from Eurasia.

Notes. Most frequent in migration November and April, but a few are usually seen December–March (its tendency to fly high makes it relatively inconspicuous, Turner & Rose 1989, Keith *et al.* 1992). Extreme re-

cords are 23 September to 8 May (seen late September in only three years, and after 15 April in only two years). Often associates with Barn Swallows, casually with Red-rumped Swallows; also seen with various swifts *Apus* spp., including migratory Eurasian Swifts, and with Eurasian Bee-eaters (circling these, but keeping pace with them as they move S). Drinks, closing the wings and dipping the bill at dams. As many as 300 or more noted in flocks during October and April, as many as 70 seen as late as 22 April 1993. More attracted to storm edges than Barn Swallows during months when it is present, and frequently outnumbering that usually more numerous swallow at such times. Glides, soars and turns more often than accompanying Barn Swallows; less frequently makes sharp zig-zagging movements.

MOTACILLIDAE Wagtails, longclaws, pipits

Yellow Wagtail *Motacilla flava*

Months. 4 September–11 May, most common April, commoner December–February than September–November.

Ecology. Irregularly common, even abundant in grassy areas and near water September–April, with records in four years beyond 20 April, to 2 May 1997 and 11 May 1990. Prone to feed in short grass, especially where wet or damp, as SE of Big Dam, ditches along roadsides and wet pastures as at Center. Frequently feeds at the feet of livestock, particularly a group of donkeys at Center. Sometimes occurs in bare areas, repeatedly in 1996 about a small patch of *Datura* sp. growing openly on bare soil NW of Big Dam. Reported as early as 4 September 1968 by Horne, Sassoon, and A. and J. Start. The largest numbers seen are in December–January and April when flocks of up to 200 have been noted. One or two may remain for long periods about the several houses in the study area, bathing in lawn-sprinkler water and securing insects from well-tended gardens.

Movements. Essentially covered above. Dates of occurrence are in line with those of Lewis & Pomeroy (1989), Keith *et al.* (1992) and Zimmerman *et al.* (1996). We note that Goodman & Meininger (1989) had migrants reaching Egypt as early as early August and as late as mid-June, giving potential for Kenyan occurrences from early September, and as late as mid-May.

Races noted. Only occasionally were we able to devote time to the matter of racial identity of the birds observed, the many subadults and winter-plumaged FF

posing time problems in habitats away from study sites. About half the birds observed were *M. f. flava*; *M. f. lutea* was much less common and, as MM are readily identifiable, may have been overly noted; certainly *M. f. beema*, *M. f. thunbergi*, and *M. f. feldegg* were well represented. Some entire flocks seemed to be of *thunbergi* (in December, January, April), and the 11 May 1990 late record was of a M of this race (feeding at the feet of a donkey). One December M with a very white head appeared to represent *M. f. leucocephala*, of which there are few Kenyan records. Intergradient individuals were noted, and probably were as common as, say *M. f. feldegg* or *M. f. beema* (see Keith *et al.* 1992 for these “hybrids,” some named as races, that are inadequately treated in Lewis & Pomeroy 1989, van Perlo 1995, Zimmerman *et al.* 1996, and Stevenson & Fanshawe 2001, which illustrate a preponderance of boreal spring, breeding-plumaged males).

Cape/Wells's Wagtail *Motacilla capensis*

Months. July, September, three records; casual visitor from higher elevations to the S.

Notes. Single individuals observed in the S of the area by a small swamp along the stream at NG 10 July 1990, in a muddy overflow area at SI 21 September 1986 (both adults), and in a muddy backwater at LU 29 September 1986 (a juvenile, apparently independent of its parents, still with a conspicuous gape wattle). Brown & Britton (1980) showed April–September breeding (plus a January record) of this highland wagtail that may breed just S of the study area. Obviously some dispersal and perhaps other movements occur, although most pairs may be resident (Stevenson & Fanshawe 2001, del Hoyo *et al.* 2004).

Gray Wagtail *Motacilla cinerea*

Months. September–October, December–January, March; seven records.

Notes. Perhaps the most graceful of the wagtails, observed not at flowing streams but at Big Dam (one or two there 2 January 1995, 6 January 1995, 22 March 1993 and 30 December 1993), at watering places at Center (S. Sassoon January 1981, 1 October 1987), and in wet pasture 28 September 1987. In five of the seven cases two individuals, including one (or two) M, were seen; the 30 December and January MM showed several black throat feathers, and the March birds, both MM, were in nearly full breeding plumage. It is a boreal winter visitor to the highlands of Kenya (Lewis & Pomeroy 1989).

Mountain Wagtail *Motacilla clara*

Months. September, October, January; three records.
Notes. Though mainly resident at fast-flowing mountain streams, it does wander (Lewis & Pomeroy 1989), as our records show. The three adults were observed: 21 January 1986, along the Mukutan River; 12 September 1988, at the flowing portion of the stream at NG; and one calling (“ikikik”) at the fast-flowing river, MK, 16 October 1992. Breeding is unlikely due to variation in water-flow along streams, all of which are dammed.

Pied/White Wagtail *Motacilla alba*

Months. January, February, December; four records.
Notes. A M at Big Dam 9 January 1994, and another 4 February 1992, coupled with a series of records of one M there on five occasions 14 December 1995–3 February 1996, in the last case with a second M and a F, constitute our records, although distant “pied wagtails” passed off as African Pied Wagtails seen driving past dams in November–March (when migrant Pied/White Wagtails might be expected, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996) could have included individuals of this Palearctic species. Big Dam is at c. 1885 m (Stevenson & Fanshawe 2001 gave 1600 m as its upper limit). The M seen 14, 17, and 29 December 1995, and 2 January, and 3 February 1996, associated with dam-edge-foraging Kittlitz’s Plovers once, and perched above the dam in an *Acacia gerardii* tree on another occasion. One of the two MM observed 3 February had new throat and crown feathers (see Cramp *et al.* 1988).

African Pied Wagtail *Motacilla aguimp*

Months. Common resident about major dams and habitation.

Ecology. Forages on ground, especially where wet, shorelines, dam walls, and nearby bare ground. Feeds in and drinks sprinkler water at lawns and gardens. At Center often about meat shed when carcass is hanging, feeding on scraps below but mainly flycatching for flies about the meat, or flies flushed by babblers and starlings eating meat. Also flycatches for emergent termites, even in rain. Forages alone, in pairs or as families, fights others that intrude. Two or in some years three pairs about Center. Individuals visit small dams occasionally, but rarely feed along fast-flowing Mukutan River. No movements otherwise.

Behavior. Aggressive at times, attacks seen on Common Sandpiper, African Drongo, even Fan-tailed Raven. Displays not noted in detail (Keith *et al.* 1992, del Hoyo *et al.* 2004).

Voice. Its cheery song was heard April–September and November–January.

Breeding. Both nests and fledged young seen late April–August. Most nests in sheds, garages and other outbuildings, but used old woodpecker cavity in dead tree standing in the dam at LU in at least two years. Known to breed every month of the year within our area (Brown & Britton 1980), and occurs throughout the region (entire Laikipia Plateau, Lewis & Pomeroy 1989).

Golden Pipit *Tmetothylacus tenellus*

Months. January, February, September, three records; casual wanderer from N and E.

Notes. Usually in open country, we may have missed FF and immatures. Adult MM observed: 16 January 1989 drinking from the stream at NG, 16 February 1988 about the Kuti airstrip (possibly in postbreeding molt, breeding records from the region generally are sparse in December–January, Brown & Britton 1980), and 8 September 1986 at Kuti in the wet area near cattle pens. These sites are at 1850–1950 m, above the usual elevations given (Lewis & Pomeroy 1989, Keith *et al.* 1992, and Stevenson & Fanshawe 2001, who reported it to 1800 m). It usually reaches Lake Baringo (several records yearly October–February, Stevenson 1980) from lower areas to the N and E.

Yellow-throated Longclaw *Macronyx croceus*

Months. January, April–September, November–December; very local resident Nglesha.

Notes. C. two dozen records, four away from NG at pasture areas N of Main Gate and just E of there near PO. Songs and flight displays noted in all months of records above. It can hover in the air, perhaps watching the direction in which its mate will go. Occurs mainly in lush grass and wet areas with bushes and trees; M sings from bush to top of an *Acacia abyssinica* at 18 m. Songs heard were “pee-poo-eee” and “pee-eeer” (see Keith *et al.* 1992). Probably resident at NG, but some movement is indicated by the records away from there (see Lewis & Pomeroy 1989; del Hoyo *et al.* 2004 give no Kenya movements). In wet years as many as four pairs at NG (Fig. 15). Breeds at almost any time that conditions are sufficiently wet (van Someren 1956, Brown & Britton 1980, Keith *et al.* 1992).

Rosy-throated/Red-throated/Rose-breasted Longclaw *Macronyx ameliae*

Months. February, September; two records.

Notes. Reported to us by S. Sassoon (one at NG in September 1980). We saw but one, a M flushed from

short grass beside Kuti airstrip 10 February 1999; it flew to the top of a 3.5-m *Acacia gerrardii* tree and faced us (into the wind). It was in full, red-throated plumage. Extensive wet grasslands that it favors are lacking in the study area. Sporadically occurs about the Laikipia Plateau (Lewis & Pomeroy 1989), as at Mutara (Olson *et al.*, undated MS).

Richard's/Grassveld Pipit *Anthus novaeseelandiae*

Months. All except March; locally common, may leave in dry years.

Notes. Most regular about Nglesha and pasture area near Main Gate, but also about Center and at times Kuti. Visits grassy areas near dams when it has been wet. Seen in low grass, sometimes at airstrips; also in ploughed fields and grain cultivation (Nglesha, Fig. 4). Sings May–July; pair with begging juvenile E Kuti 30 June 1987 indicates breeding following big rains (see Brown & Britton 1980, del Hoyo *et al.* 2004). Occasionally perches in bushes and trees, and on fence posts. Sometimes occurs in grass at bomas. Not seen in drought years, may leave (see Stevenson 1980, Lewis & Pomeroy 1989). One netted at LU 2 February 1988; weight 22.25 g, wing 91 mm, in heavy body and tail molt, molt of wings newly completed; *A. n. lacuum* is the local race (Keith *et al.* 1992).

Tawny Pipit *Anthus campestris*

Months. One definite record, January.

Notes. Several possible individuals observed but none closely or for long enough except for an adult 29 January 1998 in the drainage ditch of a large grassy patch beside the banda at GMF. A sandy-buff-colored bird with faint lateral breast streaks, a broad superciliary and dark eye-line, it walked about, tail-waving, foraging horizontally like a wagtail along the drain. We noted its orangey yellowish legs, having seen so many pink-legged Plain-backed Pipits, and its conspicuous black median coverts (Harris *et al.* 1989, 1996). Lewis & Pomeroy (1989) noted that it probably is overlooked, and there are records to the W and E of the study area. Plain-backed Pipits forage occasionally along the road into and through GMF, but this was the only similar pipit seen at camp itself, and its habits and features differed greatly from those of the Plain-backed.

Plain-backed Pipit *Anthus leucophrys*

Months. The commonest of its family in the study area.

Ecology. A very common bird, probably in part because it favors bare ground along roads with scattered grass and bushes, and hence is conspicuous. Also in

old bomas, around cattle, at grassy and bare areas about dams, and at short-grass airstrips. Usually near bushes and trees in its open habitat; readily perches in bushes and trees, and occasionally sings in them. May forage near cattle, other domestic animals, impalas and guinea fowl; in bushy areas may loosely forage in mixed-species flocks as with various bush-shrikes, warblers, and African Drongos. Feeds near lion kills and digs under and into dung piles. Foods described in del Hoyo *et al.* (2004). It likely is favored by overgrazing and burning.

Movements. Occasionally seen in numbers up to six or eight, but we saw no evidence of movement. Paired birds remain together all year, and usually can be found around favored sites, as Posho Corner and Kuti airstrip and cattle dip throughout the year.

Behavior. Often interacts with larks *Mirafra* spp., which share its habitat. Aerial displays can involve circling while singing, ending with a sharp dive to the ground, and brief displays with beating wings or wings held in stilted position in flights from bush or tree to ground. One at High Boma beat its wings rapidly but moved slowly at 5 m, its breast held forward and tail partly upward as it flew. Aerial displays were noted April–August and in November.

Voice. Simple song (Keith *et al.* 1992) and usually double “tis-sik” call note. Some songs are very simple series of “tshce” notes, or a “pee-twee-oo-see,” in flight, from the ground, or a perch in a bush or tree or fence. Variant songs from tape recordings are: “t'yeca, t'yeece, yew;” “swee-sweeee;” and “wee-weeta-wee.” Call note and songs match this species rather than Buff Pipit *A. vaalensis* with which del Hoyo *et al.* (2004) ally *A. l. goodsoni*.

Breeding. April–August, possibly occasionally November–January, as indicated by singing, aerial displays, adults seen carrying insect food, and bob-tailed fledglings July–August (see Brown & Britton 1980). No nests were located, but little time is spent in its habitat. Adults had usually one, occasionally two young accompanying them.

Specimen data. None were netted, as nets were not located in their habitat, but some were observed at very close range. The thighs of adults locally (race *goodsoni*, see Keith *et al.* 1992; see also del Hoyo *et al.* 2004) usually are brown and cause the pink legs below them to stand out. Our observations of fledglings contradict Keith *et al.* (1992) regarding the markings on the breast and sides; six that we saw had less, not more spotting there. Notably molting birds were seen July–September.

Long-billed Pipit *Anthus similis*

Months. January, April, July, November–December; c. 15 records, local, perhaps resident.

Notes. Uncommonly and not regularly found around rocky, bushy and grassy slopes, mainly in the NW (Mukutan, MB, to PK and TA), but also occasionally about main airstrip in rocky barren edges, on irregular ground N of Center, and once about NE Big Dam (where rocky). Probably resident, usually seen in pairs (half our records from July alone). Big and dusky (only belly was noted as “white” in the underparts), notably streaky above with a strong malar line (v Plain-backed Pipit), it is distinctive in its double call-note (Keith *et al.* 1992). A pair fed with several Fawn-colored Larks N of High Boma. We failed to hear its song. It is known elsewhere on the plateau (Lewis & Pomeroy 1989).

Red-throated Pipit *Anthus cervinus*

Months. September–October, December–February, early April; about 10 records, casual visitor.

Notes. This Palearctic visitor has been noted in damp areas beside dams and the river, and on a watered lawn at Center. Two fed with several plovers and Yellow-rumped Serins in short grass back from SE Big Dam 13 December 1995. All had this pipit’s strongly marked flanks and off-white undertail coverts. One F netted 29 January 1995 at MB had wing 82.5 mm (tertials only 0.5 mm shorter than longest primaries), and weighed 21 g; its rectrices and long claw matched those shown in Svensson (1984). Its underwings particularly were molting. A pinkish-throated M netted 4 February 1987, and in molt, weighed 20 g and had wings at 82 mm. The earliest seen, one pink-buff-throated, the other white-throated (first year), and both with streaked rump (see Cramp *et al.* 1988, Harris *et al.* 1989, and Beaman & Madge 1998), 28 September 1997 south of Center, were near a small dam. Two MM and a F were S of Big Dam 3 April 1993, our latest record. It was reported by Sassoon, Horne, and the Starts 4 September 1968 in the study area, decidedly early, although passes S through Israel from mid-August.

Tree Pipit *Anthus trivialis*

Months. November–January, April; possibly regular visitor in small numbers.

Notes. This dainty Palearctic visitor was observed in open areas beneath trees, or near trees, in which it takes refuge. Usually seen singly or in groups of up to five, often near water. Often calls (“tzeep,” see Keith *et al.* 1992) as it flies to a perch in a tree; more often

seen about wooded sites, and in taller trees than those in which other pipits may occasionally perch. We have four records for April, two each in 1993 and 1995; these were 6–20 April. These might be considered late (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996), but migrants are common in Egypt through late May (Goodman & Meininger 1989), and it occurs S of us in southern Africa through April (Harrison *et al.* 1997), hence even early May Tree Pipits are possible, and, in fact, Stevenson & Fanshawe (2001) have reported its occurrence October–May within E Africa.

CAMPEPHAGIDAE Cuckooshrikes

Black Cuckooshrike *Campephaga flava*

Months. All; most records April–September, but singing noted and pairs seen in all months.

Ecology. Occasionally resident in wetter years, and preponderance of April–September Black Cuckooshrikes are actively singing, chasing, courting and thus, breeding birds (see Lewis & Pomeroy 1989, Keith *et al.* 1992, and Zimmerman *et al.* 1996). Occurs in riverine woods, woodland, taller bushland, and edges of thick woodland/forest. Forages by gleaning and flycatching, often eats caterpillars and termites. Pairs or individuals often join mixed-species foraging flocks. Feeds in lichen-covered dead branches, occasionally goes to ground and may forage for termites there; rarely drinks at streams or puddles. Often unobtrusive, appears sluggish but partly because it seeks moving prey, thus is patiently “flycatching.” One F pirated insects from a Variable Sunbird, plucking them from lichen-infested bark of a tree.

Movements. No obvious signs of movement, but numbers decrease September–October, and noted 11 times in five years in each of October and November, 10 times in four years in February and but three times in two years in March. Usually appears April and May. Present December–January in nine of 14 years. Those present April–September seem to be actively breeding. We have not observed it in groups (see Keith *et al.* 1992) indicating movement.

Behavior. An aggressive posture used interspecifically by a M was a “guinea-fowl” posture, all fluffed feathering, back humped, rump spines projecting, wings partly out and tail spread. Both sexes have been seen “sunning” themselves. Singing MM usually hold the tail down, rump feathers erected (spines showing), especially if a F is near; sings with brilliant gape open, the orange framed by black edges of the bill. A singing M may cock its tail at times. Both sexes chase and

fight, as when two MM are with one F, or vice versa, or two MM and two FF come together. In flight display M may flip its tail about, fly with fast-beating wings, but shallowly and slowly moving overall, in a tilted flight in a line, and call (“psheeeeee”), landing with wings drooped out, and head low – it may then attack a second M, if present. Two close MM waved the wings, often separately, crouching with tail spread, then attacked one another. If the M is yellow-shouldered (see below), the yellow mark is conspicuous during displays (feathers erected). In F-F chases the FF flick wings and trill (song), and one may land atop the other; they may fight, especially in the presence of a M. If two MM are present the MM display more, as above, and give flight displays, calling “pew” to “scheew,” without songs, as the FF chase and fight. A lone M with two FF erects its feathers all over (even in flight), sings in flight, and moves about the FF in fluffed-feather postures; the M may pursue one, then the other F. A F near three MM waved her wings, sang, then pursued one or another of the MM.

In courtship M calls with tail cocked or down (rump feathers erected); he flicks one wing, then the other (reminding the observer of the person “flagging” aircraft to their berths on the ground), flicks his tail side-to-side, then cocks his tail and calls. The F may approach the M, spreading and closing the tail; she may then solicit, and copulation may occur. The M may display and call (“butterfly” flight), described above, then supplant the F. He then may trill (sing) and follow her about in slow, floppy flight. The M usually follows the F as they forage together, before nesting; he courtship-feeds her at times. These details add to those in the account in Keith *et al.* (1992).

Voice. Snaps the bill sharply and loudly when held by us. Song is a trill somewhat like that of the Brown-backed Honeyguide, and the trill call of Purple Grenadier, but unlike those, rendered in bursts of two to six songs, one after another. Thus, it is a simple “dddddddt” (see Keith *et al.* 1992). Almost serving as a song, and frequently uttered in flight is a “tzeeee” to “psheeeeee,” heard from MM (whereas trill song also is given by FF at times). A M in flight display sang “tch-deeep, DEEP, cheep, cha-cha, chee-ep.” Another song was “chip-chip-tttcheeah, tch-eee, ah-tchew-tchewp,” plus a terminal chip series, this with the F present. The “ttcheeah,” “yeeceup,” and “tdzheecow” notes of some songs and calls are very like calls of White Helmetshrikes. We have also heard repeated “whee” calls during M-M chases, as well as a “chee-up” double note. Heard rarely was a sharp

“t’shew,t’shew” (see Maclean 1993). Gives “tzecek-cek” notes aggressively. In most years songs and display calls were heard at every site during April–August. Many vocalizations were recorded on tape.

Breeding. Songs and MM accompanying FF in every month suggest breeding can occur under moist conditions at any time. April–September, the times of the big rains and rains of July–August, mark the main period of breeding, but in some years breeds December–February; copulation attempt noted in February, soliciting F before M in December (Brown & Britton 1980 gave March–April, October, and December for the region including the study area). Six nests date April–June, nest-building was noted May–July, fledglings were seen April–September, and subadults and independent juveniles were observed June–October, and December. Farther E, at Nanyuki, we had breeding after heavy October–November rains, in November–January. Few nests could be followed rigorously. One in which the female was incubating 28 April had two young 12 May, and was empty but in good condition (fledged) 26 May. Six nests were 3.5–15 m up various trees, including crotons, olives and a *Canthium lactescens* (with dried leaves, conspicuous, lost to predation). Lichens seem required for construction of nests and for siting them, usually in a small fork and inconspicuous by virtue of the matching brown, gray and white lichens near them. Spiderwebs also important for nest construction; however, some or all such could be “beard” lichens that van Someren (1956) noted in the entirely lichen nest that he found. The F molds the nest with her body, incubates the eggs and broods and feeds the young alone at first. The M courtship-feeds the F, and watches her construct the nest. If M approaches the nest under construction the F meets him and accompanies M to the nest. After hatching the F may rush to meet the food-bearing M as he flies in, and she takes the food to the young; or he may go to the nest and feed the F. When the one or two nestlings are larger, the M may feed them directly in the nest, indeed, the M may sing from a perch on the nest. Subadult MM in changing plumage sometimes sing, and may briefly vie for the F with fully adult MM. Two nests at MB in June 1991 were *c.* 65 m apart; no interactions were noted between pairs. One F with a begging fledgling 4 July fed it repeatedly on tiny grasshoppers near or on the ground for 0.5 h, then moved to the canopy and hawked insects there, while the youngster followed, begging frequently.

Specimen data. We netted a total of 27, consisting of one juvenile, five subadult (three MM, two FF), six MM and 15 FF. We suspect that MM forage higher on the average than do FF, accounting for the preponderance of FF and immatures (78%) over adult MM (22%). We saw at least 13 MM with a yellow patch, somewhat variable in size, at the bend of the wing (wrist or "shoulder") and one of the six MM netted had such a mark; probably one in 20–30 MM had such a yellow patch, a variable polymorphic situation (Keith *et al.* 1992). The five MM weighed 33–42.5 g (mean 35.4 g), one was not weighed; four measurable MM had wings 99.5–104 mm. The 15 FF weighed 28.25–45.25 g (mean 34.4 g), and 10 measured wings at 97.5–106.5 mm (102 mm). The six juveniles-subadults weighed 32–36 g. The birds were netted April–October and January–February; non-adults August–October and December. April and July–August marked heavily molting cuckooshrikes. Of the MM, most had an orange or even orange-red gape wattle; the wattle tends to be paler than the gape, and was yellow in one M (that had an orange gape). Keith *et al.* (1992) gave the gape as yellow and most works show it yellow; Maclean (1993) gave it as yellow-orange, closer to the condition as we found it. The orange of the mouth and wattle extends to inside of nostrils in some individuals. The juvenile had mouth and tongue yellow-orange and wattle or flange bright orange. The opening and closing of the bill, black-lined around orange or yellow-orange, is startling and must show in displays such as snapping the bill and gaping. All FF had a yellow-orange or wholly orange mouth. Maclean (1993) described the M bill as black with a pink base; none of our cuckooshrikes had pink about the base of the bill. FF show a conspicuous white suborbital mark that merges into the pale streaks of the ear coverts, hence looks like a stripe in some individuals (as in photograph in van Someren 1956); this is not evident in most illustrations. A nestling less than a week of age, seen above us at c. 4 m seemed to have a very pale (whitish) head with the black eye-stripe conspicuous, and sparse barring on its upper breast. Finally, a June F (the heavy one at 45.25 g) had a brood patch, and a M netted 4 February (the brightest-gaped M) had a cloacal protuberance.

Purple-throated Cuckooshrike *Campophaga quiscalina*

Months. March–April, June, August–October, December, 10 times; local resident Nglesha.

Notes. Seen or heard at NG on perhaps every third visit over such months as to suggest it is resident, as

it is known to be (Keith *et al.* 1992, Zimmerman *et al.* 1996). A very small relict population exists; maximum seen four on any one trip. Often in dense understory and thickets alongside riverine forest. Calls heard March, songs heard June, October, and December, and F in low fluttery flight similar to flight display of Black Cuckooshrike in June. Vocalizations include: a clear whistle in the hand by an immature; a "peew" call with a slight burr in it; and the song, a series of piercing "theew" or "peeew" notes at two or three per s, with up to 12 notes. The song resembles a slowed-down version of the fast trill of the Black Cuckooshrike, e.g., up to 22 "sweet" notes slowing in tempo; calls similar to those of its commoner relative. It utters "snip-snip-sneep" calls and helmetshrike-like "wee-ohpp" notes at times. A singing M raises its tail and head, and opens its mouth (orange-gold in F, gold-orange in M). We have not seen a F sing, though it may do so. Vocalizations were recorded in June and October, when three MM pursued a F. We netted an immature (30.75 g weight, wing 92.5 mm) with an adult M (31.5 g, wing 100 mm) 11 September 1989, indicating breeding May- or June-August. On 25 June 1991 we netted a pair (close together, low in dense growth along stream). The M of the pair weighed 31 g, had a wing measurement of 104.5 mm (but molting, primaries 1–3 new, and a cloacal protuberance measuring 0.5 cm). Its gape was more orange than that of the F, which had an orange-gold gape. Note that the fully opened bill presents a distinctly different gape from that of the Black Cuckooshrike – the color may be similar but the entire inside of the mouth and tongue are fully colored in the Purple-throated, whereas the Black Cuckooshrike has black inside the front of the bill extending inside laterally, so the colorful parts are outlined in black from the front. This may be important in species recognition as the two species overlap. Black was pronounced over the eye of the M, standing out from the purple-black and blue-black nearby. Its mate weighed 36.75 g, had worn wings at 97 mm, and showed a fully wrinkled broodpatch, hence was breeding. This F was very faintly gray-banded on the sides of breast and throat; barring is not evident in the field but marks the race *martini* found in Kenya (Keith *et al.* 1992). In the field MM appear black, showing purple highlights; the underparts never look all-purple, even in hand-held birds.

This highland species does not occur in montane forest "islands" to the N and NE of the study area (Lewis & Pomeroy 1989). This is the first record for

the Laikipia Plateau. We note that it is not a true forest denizen (see Brosset & Erard 1986), but prefers edges, thickets and second growth highland forest and woodlands in more moist situations than its sympatric, more common relative the Black Cuckooshrike. Some consider it threatened regionally (Bennun & Njoroge 1999).

Gray Cuckooshrike *Coracina caesia*

Months. January, May–July, September; casual visitor, possibly breeds rarely.

Notes. This is a distinctly larger bird than the previous two cuckooshrikes and is of uncertain status, though found in nearby highlands to the S (Lewis & Pomeroy 1989), and on montane “islands” to our N. Our records could be of dispersing or wandering individuals (see Zimmerman *et al.* 1996). It was seen in canopy, and in more woodland situations (at SI, LU and NG) than the last species, as in *Euclea-Olea-Croton* woodland, gleaning in the foliage and once at NG feeding at the yellow flowers of *Trichocladus ellipticus* (Hamamelidaceae). Both MM and FF were observed, and a pair was seen at LU 20 June 1992. The song, heard 7 January 1988 at NG and 18 July 1993 at NG was a weak, semi-trill, a “tseet-tseet-tseet-tseet” (less slurred or descending in pitch than Keith *et al.* 1992 and Zimmerman *et al.* 1996 indicated). Calls heard on three occasions were a “tchit-tchit” or “tsip-tsip;” known to be very vocal, its voice may be variable (see Maclean 1993). All individuals observed appeared to be adults (sexes not always distinguishable in dappled canopy); no juveniles, which are distinctive (Keith *et al.* 1992), were observed. Lack of observations of juveniles and failure to find this species consistently at the three sites (especially at very frequently worked SI, where observed only twice) suggest that all were wanderers and not breeding visitors.

PYCNONOTIDAE Bulbuls, greenbuls

Yellow-whiskered Greenbul *Andropadus latirostris*

Months. All except March, Nglesha only, where seen or heard on every visit.

Ecology. Centered about the forest patch at NG, where found in numbers, and also in riverine woods and adjacent thickets, in lesser numbers. Forages at all heights, but often low (Keith *et al.* 1992).

Movements. None, this is a resident population.

Behavior, Voice. Songs have been heard in all months of our visits. One uttered a “shreek” after release, and another called “weet-weet” in hand, calls perhaps differing from those given in Keith *et al.* (1992).

Breeding. No nests located or young netted (the site was difficult to work). Probably breeds during all rainy periods (i.e., April–September, November–January in “normal” years), as indicated by data in Brown & Britton (1980).

Specimen data. Seven adults netted (January, February, March, April, July, August) weighed 26–32.25 g (29.0 g), and four measured 84.5–91 mm in wing length. Molting was noted in one January and one April bird, and a fresh individual in July was completing body molt (otherwise fresh-plumaged). The orbital skin is yellow-olive; the gape varied from yellow to orange-yellow, yellow extending onto the corners of the bill, and along the tomia, some even having the bill tip horn-colored. This greenbul is one of those species having serrations on the tomia near the tip of the maxilla (Keith *et al.* 1992).

Common Bulbul *Pycnonotus barbatus*

Months. Common to abundant, mainly resident.

Ecology. Occurs in all areas except grasslands, airstrips (but visits bushes on them), and open water; is less numerous in dense woods, forest, and in extensive bushland dominated by lelelele. May be monogamous and on small territories (van Someren 1956, Keith *et al.* 1992) when breeding, but gathers in numbers up to c. 200 (July–September) or even 500 (November–January) at heavily fruiting bushland and bushed woodland sites; also gathers to drink, and in extended dry periods “waves” of Common Bulbuls, with 15 to 30 or more in a “wave”, may come and go from permanent water at dams and along the Mukutan River. Flycatches expertly, hawks insects to the ground, feeds on lawns in the manner of *Turdus* thrushes at times. Among insect foods are termites, caterpillars, butterflies including *Colotis* sp. (Pieridae), spittle-insects (Cercopidae, Homoptera) and others (see Keith *et al.* 1992). Often found in mixed-species foraging flocks. Regularly seen eating bits of meat and fat from carcasses hanging in a meat shed, and visits suet-feeders to eat suet. Eats fruits of *Olea* sp., *Ficus* spp., and *Rhus* spp.; fruits taken regularly and not cited by Keith *et al.* (1992) are those of *Carissa edulis* (Apocynaceae), *Euclea* sp. (Ebenaceae), and to a lesser degree *Scutia myrtina* (Rhamnaceae) and *Apodytes dimidiata* (Icacinaceae). Vast numbers congregate to feed on ripe berries of *Carissa* sp., *Euclea* sp., *Olea* sp., and *Ficus* spp. Feeds in blossoms of *Acacia gerrardii*, the Nandi Flame *Spathodea campanulata* (Bignoniaceae), and crotons (*Croton* spp.), eating nectar or flower parts; sometimes has front of head covered with yel-

low pollen from flowers likely *Croton* spp. Also hangs upside down to break open pods and eat seeds of *Senna singueana* (Caesalpinaceae). We have shown (Horne & Short 1990) that it casually and sometimes regularly eats beeswax from wax feeders put out for honeyguides, and may so dominate Lesser and Scaly-throated honeyguides at such hives as to be pests that have to be driven off (one bulbul collected with stomach entirely full of beeswax). Is a primary mobbing species, giving early warning of the presence of predators such as mongooses, and snakes, and mobbing them. Mobs owls, especially the Pearl-spotted Owlet (up to nine bulbuls mobbed one owlet), and predatory birds such as Gray-headed Bush-shrike and White-browed Coucal, both predators of eggs or young of the bulbul.

Movements. During extended dry periods bulbuls are virtually absent from dry woodland and bushland sites, and remain numerous only about buildings (Kuti, Center, Nglesha Center) and the site at Nglesha. In years of drought numbers fall by perhaps 90%. During local fruiting periods numbers increase drastically at the site of ripening fruits, and numbers, as at GMF, drop considerably, from eight or 10 pairs to but one pair. When fruiting happens to be general in a major part of the area, bulbuls congregate and large numbers from outside the study area augment residents. Thus, there are local movements seasonally, and more general movements periodically, influenced by rainfall and fruiting regimes, but these are only partly understood.

Behavior. Many aspects have been discussed by a number of authors (e.g., Short 1964, Keith *et al.* 1992, and Lloyd *et al.* 1996), but much remains to be learned. For example, we have noted courtship feeding of insects, berries and of beeswax, unreported in the works cited. Studies are needed of sexed, marked individuals in several places over the range of this species. One display of a M before a F watching him from c. 35 cm, and at a lower height was as follows: the M opened its bill, chattering, with tail 70° below horizontal, and partly spread; the rump and back feathers were erected considerably; the wings were spread outward and downward and held with feather tips spread (individual feathers visible); this position was held until chattering finished, then the head and bill were pointed farther downward and the tail was raised nearer the horizontal (30° below it). Both then flew. This does not precisely match displays described by Keith *et al.* (1992) and Lloyd *et al.* (1996).

Voice. Poorly understood, needing in-depth study over all its range, e.g., Lloyd *et al.* (1996) based their results on only 42 phrases ("songs") from a few localities in the regularly and strictly seasonal, temperate fringe of South Africa. Those authors, and indeed most workers (Cramp *et al.* 1988), have failed to distinguish songs from other vocalizations. Although Keith *et al.* (1992) noted that both sexes of this bulbul "sing", dawn "songs" about GMF were uttered by only one bird of each pair. Lloyd *et al.* (1999) also found that but one bulbul of a pair actually "sings." Initial morning "songs" are repeated nearly identically by one M after another, using a phrase or motif that varies mainly in the number of notes contained (see Lloyd *et al.* 1999). An individual singer may gradually add notes to its song, thus: "chuk-will," "tchik-chuk-wik-will," "pee-chuk-chuk-wee-tle," "chuk-chok-wit-go-wit-tle," etc. Calls from neighbors at this time are often closely similar or identical, but later in the morning more variable "song" occurs. Another array of calls or song involves "peep" and "lo" notes, as in Indian relatives *Pynonotus cafer* and *P. leucogenys* (Short 1964), including: "pee-ter-oh" (van Someren 1956), "peep-peep-a-lo," "wik-peep-a-lo," and "peep, peep-a lo, peep-a-lo." These may relate to the tendency of many "songs" to end in one or two distinctive notes, a "lo," or "tle" ("peep-lo," "chut-tle," "chee-dle," "kittle," or "widdle"). The great variability of the vocalizations, even in a small area, calls for in-depth studies of tropical, as well as subtropical-temperate populations of this bulbul in order to understand its vocal repertoire. Alarm calls are also varied, and consist of often-long series of single ("ke," "tuk," "weet") or of double notes ("ü-bit," "chee-bit," "ch-pee," "kweet-ta"). Completely unstudied are complex "songs" involving mimicry of other bird sounds; these were not commonly heard in the study area. Other than the ascribing of vocalizations to the sexes, an urgent problem is to establish what constitutes song, apart from other vocalizations (calls); functions of the diverse vocalizations and their variation also have to be addressed. This bulbul is decidedly vocal throughout the year, and is often one of the earliest dawn-singing passerines (preceded only by some thrushes and drongos). We heard no "songs" at night (other than predawn and dusk), although calls were elicited at times by our nocturnal movements (see van Someren 1956).

Breeding. Can breed in any month (Brown & Britton 1980, Keith *et al.* 1992), and over time may do so in the study area, given the variability of seasonality of rains. Extended breeding seasons are known as well

in tropical West Africa (Gatter 1997). Most occupied nests and nests in construction were found April–August. Fledglings and obvious juveniles were noted February–September and nearly adult immatures (subadults) also are known from January–February. Cloacal protuberances and brood patches were seen December–August. Displays associated with breeding (Keith *et al.* 1992, Lloyd *et al.* 1996), including soliciting adults and courtship feeding, date December–June and September. These data suggest a preponderance of breeding April–July, with some breeding December–March, and, to a lesser degree, August–October. Nests are situated essentially as van Someren (1956) showed, in forks of trees, bushes and rarely ferns from 0.3 to 4 m; sites are often in edges of bushland or woodland, or in isolated trees or bushes, and may to their detriment be visible to many observers (*contra* Tarboton 2001:166). Nests are of tendrils, rootlets and small twigs, and often are somewhat bulky, to 14 cm in diameter. Eggs number two or three (see description in Keith *et al.* 1992); a two-egg clutch weighed 3.4 and 3.5 g. Van Someren (1956) noted that the contents of exposed and low nests were often lost to (bush-) shrikes, mongooses and other predators. We have seen a White-browed Coucal take the eggs from two successive nests of one pair of Common Bulbuls; both nests were visible to us at some distance. We have not observed more than two fledglings from any one nest. Young and adult bulbuls have many predators, especially including the Gabar Goshawk; an Augur Buzzard took a bulbul from one of our nests.

Specimen data. We probably handled well over 1000 of these bulbuls, at times netting eight or 10 at once, and renetting netted birds up to five times in a day; we weighed 285, including seven juveniles. Adults were netted in all months, and included 141 in obvious (wing, tail, conspicuous head or body) molt, and 137 non-molting bulbuls. Two-thirds or more of the birds netted June, July, September and November were molting, with the fewest molting bulbuls in December–January. There was essentially no difference in weight between molting (mean 34.58 g) and non-molting (mean 34.4 g) adults; overall, the range was 29 to 42.5 g, and the mean was 34.49 g, about that shown for the region by Crowe *et al.* (1981). The seven juveniles averaged 31.5 g (range 28.5–34 g). One F bulbul, ringed as an adult weighed 35 g, it weighted 37.5 g 13 months later, and 5.5 years later (aged *c.* eight years) weighed 33 g. Keith *et al.* (1992) noted that MM are heavier and longer-winged than

FF; our 21 MM with a cloacal protuberance were 31.25–40 g (mean 36.1 g) and six FF with a brood patch weighed 31.5–37.5 g (mean 34.4 g). Also, four obvious pairs had MM 34–39 g and wings 93–96.5 mm, while the FF had weights of 31.5–37.5 g and wings 87–89 mm; MM appropriately were larger except for a one pair. Wings ($n = 127$ adults) were 84–104 mm with a mean of 91.69 mm. These weights and measurements are low for *P. barbatus tricolor*, the highland Kenyan race (Keith *et al.* 1992); two adults with white in ear coverts, but showing no other indications of leucism or albinism, may indicate introgression from smaller *P. b. dodsoni* to the N and E, or the smaller size may be fortuitous. Four others showed leucism, with white feathers on several parts of the head and body. Two partly albinistic birds also were observed. This bulbul has scattered fine hair-like filaments (filoplume-like), projecting well beyond the normal crown-nape feathers. The molt may be interrupted (outer 4 or 5 primaries new inner primaries old, all fully grown and with no other molt evident, in at least four birds), irregular (tail, see below), asymmetrical (wing or tail, e.g., primaries starting at number 1 on one side, and at number 4 on the other), and the tail is subject to adrenalin molt, all tail feathers shed at once on capture and bagging (four cases). Primary molt starts with number 1 and proceeds outwardly. The tail is molted rapidly, starting usually after primary 2 or 3 has been molted, and often is complete by the time primaries 7, 8 or 9 are incoming. The molt is normally from rectrix 1 to 6, but rarely commences with rectrix 2 and proceeds outwardly, with rectrix 1 (or 1 and 6; once 1 and 3) the last to be molted. Molt of rectrix 1 may be delayed, or it may rarely not be molted. Secondaries and coverts proceed along with the primaries and rectrices in this molt; the body and head usually lag somewhat behind (head feathers also may be pulled out during aggressive encounters, and these are marked by a bare patch or patches of skin, or new feathers; see Cramp *et al.* 1988 for a discussion of this bulbul's molt). Soft-part colors: The bill is black (except in partially albino birds). Keith *et al.* (1992) stated that the mouth lining is yellow in adults and yellow-pink in downy young. Cramp *et al.* (1988) gave the mouth as orange-yellow. Most of our Common Bulbuls had pink, mixed pink and yellow, orange or gold, or combination of these, for mouth lining; in fact, yellow alone occurred in only 10–15% of the bulbuls. MM usually are more orange or pink than FF in mouth-lining color. The bifid-tipped, brushy tongue is orange, orange-pink,

yellowy pink, pink-yellow or yellow. Juveniles had mouth lining yellow or pale pink, and gape wattle yellow (but pale pink in one). Colors may undergo shifts, but we had no time to check this point. The eyes are dark brown; the orbital skin is more often gray or slaty than black (see Keith *et al.* 1992). Legs and feet slaty to black.

TURDIDAE Thrushes, chats, robins, wheatears

Common (Cape) Robin-chat *Cossypha caffra*

Months. All but March, October, November; irregular, may breed occasionally.

Notes. Noted once before 1991, on the dam wall at LU, 8 September 1986. Seen near or about houses, at dam walls, and especially in the S (LU, Main Gate area, NG). One 22 May 1996 in grass near acacia crossing, and a subadult at GMF late December 1991 to at least 1 February 1992, were the only ones away from the vicinity of buildings and dams. A pair seen and M singing on Big Dam wall 22 September 1995 and 11 April 1998 (also seen there 17 September 1997), suggest occasional breeding; it breeds to the S and SE, and occurs to the NE of the area (Lewis & Pomeroy 1989). The GMF bird was a subadult noticed mainly around the water bath and tented areas. Netted 10 January 1992, it weighed 25.75 g and was in adult plumage except for: buffy tips of the middle and greater wing coverts and very dull brown, white-tipped central rectrices (see Keith *et al.* 1992). Most likely a wanderer from farther S, but its occurrence at a site in extensive bushland, with our other records, indicates considerable potential for dispersal through habitats unsuitable for breeding.

Heuglin's (White-browed) Robin-chat *Cossypha heuglini*

Months. Common resident near water and in woodland and forest thickets.

Ecology. Common at well-wooded, especially riverine, sites throughout the study area; most regularly seen near water, along Mukutan River, at Nglesha, at centers (Center, Kuti) with gardens, and on wooded walls of dams. However, watercourses (luggas) it occupies are often dry, and robin-chats forage in vegetation along small luggas and in thickets away from water. They disperse through bushland and along watercourses, hence records occasionally at GMF camp, and about acacia crossing. Usually difficult to observe (except at centers about habitation, where venturing onto lawns), keeping in dense vegetation on or near the ground. Drop-forages from low perches onto in-

sects, pursues winged termites and ants on the ground, and sometimes flycatches for them. Feeds in freshly burned bushland using new grass as cover. Occurs throughout the region (Lewis & Pomeroy 1989).

Movements. Only dispersal movements as noted above. Numbers decrease in extended droughts; whether moving out or suffering mortality is not known.

Behavior. Well-known (Keith *et al.* 1992).

Voice. Rather well-known (van Someren 1956, Keith *et al.* 1992, Maclean 1993). Its contact note (Keith *et al.* 1992) or, as we designated it in the field, its song-call, is a characteristic, ringing, short series of "hoylee" phrases, often increasing in volume as the series progresses. This call varies geographically; Nanyuki birds have a flatter, less distinctive rendition. We heard this call all year, but most frequently June–September and November–January. Much has been reported on its complex and varied song, including mimicry (often imitates other birds, *contra* Borrow & Demy 2001) and duets, as well as subsong (see above references). We heard songs in every month over the years, especially in December–August, with a peak in June–July and a lesser peak in December–February. Often sings before dawn, and from dusk into the night during breeding periods.

Breeding. Territorial all year, territories often somewhat linear, as along streams; pairs at *c.* 300 m along the Mukutan River, and Kuti, Center, and Nglesha Center usually had two pairs, with counter-singing heard frequently. Breeds mainly April–September, including the period of big rains and July–August rains, but also November–February. Few nests were found (in June–July). Adults feeding dependent fledglings were observed June–August, and including two instances of feeding of newly fledged Red-chested Cuckoos (at MB 23 June, and Center 10 July). One nest was on a small ledge of a dry lugga at 4.5 m, below the overhanging top (at 5 m). It held two eggs 19 June 1994, two nestlings in late June and 11 July, and was empty, the young likely to have fledged by 17 July. As this thrush is resident, it likely placed nests away from our permanent honeyguide net lanes and associated human traffic. Subadults date from September and November–December. Likely it breeds in any season in which wet weather prevails, but we have only suggestive evidence (singing, duetting) that it breeds at times in November–January (see Brown & Britton 1980).

Specimen data. Netted Heuglin's Robin-chats of the nominate race numbered eight adults and three subadults, several of which were retrapped later. The eight

adults weighed 31–37 g (mean 38.95 g), and five had wings 93–111 mm (99.3 mm). Two of the subadults weighed 33 g; the subadults were nearly in adult plumage, with a few marks of immature plumage on the head, rump, and/or wing-covert spotting. Adults in late molt and in fresh plumage were from January–February and July, with early molting stages June. One adult banded in the MK site was retrapped there four, and then 23 months later; another from there, molting in June, was in fresh plumage (and 7.5 g lighter) the following January. Finally, an adult netted January 1986 was noted January 1987, re-trapped February 1991, and seen November 1992, and thus was at least 6.5–7 years of age (Keith *et al.* 1992 mentioned records of 8, 11, and 12 years). Soft-part colors are well-known, except references lack the color of the mouth lining, yellow in juveniles and flesh or pale pink to pink, edged along the sides with black, in adults; the tongue is pink as well.

Spotted Morning-thrush *Cichladusa guttata*

Months. May; one record, vagrant upslope wanderer from N or W.

Notes. One singing during a shower over the bird bath at GMF, later seen feeding (on wax-moth larvae) on the beeswax piled in our open wax shed (for drying), on 3 May 1994. Its harsh call note was heard over a 2-h period. The calls were noted early the next morning, 4 May, but the bird disappeared that day. The site is at 1890 m, well above the 1600 m limit usually reported (e.g., Zimmerman *et al.* 1996). It occurs just below the study area to the W (Baringo-Bogoria area, Hartley 1986 – we saw it 5 August 1977 just below the study area on the road to Tanguil Bei), and E (Pinguone; Schulz & Powys 1998).

White-browed Scrub-robin (Bush-robin) *Erythropya leucophrys*

Months. Resident in bushland, bushed grassland, and woodland edges.

Ecology. Secretive, mainly terrestrial thrush of dry bushes and thickets, often on slopes above streambeds, but also in thinly wooded dry streambeds. Mainly in central and N parts of the study area, but once at Main Gate (above 2010 m), and in degraded bushland W of the LU site in SE. Stevenson & Fanshawe (2001) gave its altitude as up to 2200 m. Hops or walks deliberately, usually under cover, flicking its tail and at every second or third flick of the tail, flicking its wings; this seems to be a foraging technique to flush insects, on which it feeds. It is, however, much

more often heard than seen. Drinks and bathes regularly where water is available, and at water is aggressive to other birds such as bulbuls, paradise monarchs and white-eyes. No movements are known.

Behavior. Flits about abruptly. Fans and closes tail, which it twitches as it sings, and also flicks wings in and out (showing off the connecting white patches of the wing coverts and secondaries). Two MM with a F nearby sang and cocked and flicked their tails; one jumped about the other, flipping its wings and spreading and closing its cocked tail as it sang as near as 20 cm from the other. MM countersinging in season. Joins warblers, bulbuls, bush-shrikes, paradise monarchs and cordon-bleus in mobbing snakes.

Voice. Heard singing and calling in every month (especially vocal April–August and December–February), and frequently calls or sings at the day's first and last light. Main call a “pee-ting” or “three-eight,” also uttered by F in response to calls or songs of its mate. Its song usually is of three to seven notes, starting as a 2- or 3-note song that has notes gradually added. Most notes are whistle versions of “pee,” “see,” “dee,” “tee,” “tsee,” and “chee,” in phrases that may end in “too,” “yoo,” “choo” or “cheet” notes. Examples are: “tee-tee-tee-tee,” “wee-pee-dee,” “wee-ter-wee-cheet,” and “eee-dee-dee-dee-dee-deet.” In countersinging, MM use somewhat different phrases and notes, and indeed a singing M frequently shifts notes and entire songs over time. One M sang “chee-see,” then elaborated it to “see-fer-tee,” and “yer-wee-wee-weep,” as a second M sang “see-ur,” changing to “see-er-too,” “see-yer-tee-tee,” then “see-er-tee-tee-teet” as they countersang. Some songs speed up, and there are many variant songs of five up to eight notes. At times songs are more melodic and complex with up to 10 notes, but these were uncommon. Mimicry occurs infrequently; we have heard the call of the Golden-breasted Bunting, the piping of Scaly-throated Honeyguides and notes of the glossy starling uttered by this scrub-robin. Frequently sings during or just after rain. Songs seem shorter than those noted by van Someren (1956), and certainly are more varied than hinted at for this race (*leucoptera*) by Zimmerman *et al.* (1996; see also Keith *et al.* 1992, and Maclean 1993).

Breeding. Very few indications other than the predominance of singing about all three rainy seasons and thereafter (see Brown & Britton 1980). Also sings nocturnally (mainly one hour before sunrise, and after sunset) April–July and December–February. Fledged

young seen July–August, and displays January and April–September. Its territories are outside the more wooded areas of our sites. Territories in degraded bushed woodland and bushland about GMF camp, where two–three pairs occurred, were estimated at c. 6–7 ha. (for southern Africa, Tarboton 2001 gave 1–5 ha per pair). In dry years, and indeed dry seasons, these seemed to expand perhaps threefold, with but one pair about camp. Lewis & Pomeroy (1989) noted its presence throughout the Laikipia region; in our study area it occurred at 1750–2150 m.

Specimen data. Seven netted, all about GMF, and all adults. These weighed 16.75–28 g (mean 19.7 g), and four measurable had wings 66–73 mm (mean 69.7 mm). One certain M was 17.25 g – it sang as we released it. One bird was starting to molt in June, and two September adults were molting; birds dated April, May and December had completed, or not yet started the annual molt. The April adult had two toes of one foot bent inward with a very short claw on each of these toes. The black bill has yellow about the basal tomsia, the mandible is half to three-quarters yellow basally, and the base of the maxilla sometimes shows a bit of yellow. The mouth lining is yellow to gold-yellow. Their eyes were amber brown, and legs were grayish pink. They represent the white-winged subspecies *leucoptera*.

Rufous Scrub-robin (Bush-chat) *Erythropygia galactotes*

Months. One record, April; vagrant.

Notes. We observed a lone scrub-robin of this species in degraded (grazed) open scrub NE of Kuti 13 April 1993. It perched on a rock, then in a bare bush, beside the car. It presumably was on its northward migration (Lewis & Pomeroy 1989), in which it reaches Egypt as late as mid-May (Goodman & Meininger 1989). The record is unusual for its altitude at 1850 m; it normally occurs below 1000 m, as to the W of the study area about lakes Baringo and Bogoria (Hartley 1986).

Eurasian (Common) Redstart *Phoenicurus phoenicurus*

Months. November–January; casual visitor.

Notes. We saw a black-throated M about Center garden 14 November 1994, and a M reported there by C. Francombe and S. Sassoon in December 1979, and through December 1980 and January 1981. It is a sparse migrant and winter resident from the Palearctic about the Rift Valley to W (Lewis & Pomeroy 1989, Keith *et al.* 1992, Zimmerman *et al.* 1996); known about Lake Baringo (Hartley 1986).

Common Stonechat *Saxicola torquata*

Months. April, September; rarely seen about S border. *Note.* Seen frequently S of the study area between the Main Gate and Kinamba, but only in the study area by Sassoon, A. and J. Start, and Horne 5 September 1968, and a pair fed inside the Ranch from the boundary fence 23 April 1994. Lack of suitable grassland edge habitat probably accounts for its rarity, but likely is regular along the S boundary. Common in the highlands just S of the area (Lewis & Pomeroy 1989).

Whinchat *Saxicola rubetra*

Months. A single April record; vagrant.

Notes. We flushed a M on open, bushy GMF slope 10 April 1998, and pursued it across the ground into Posho Corner, its rusty throat contrasting with the white subocular and superciliary marks. It is uncommon as a Palearctic migrant and boreal winter visitor E of the Rift (Lewis & Pomeroy 1989, Keith *et al.* 1992), occurring just W of the study area at lakes Baringo and Bogoria (Hartley 1986). Known from Kenya through April; common migrant in parts of Somalia in late April and early May (Ash & Miskell 1998), and reported from Lake Baringo into May (Stevenson 1980). Also occurs to May in W Africa (Borrow & Demey 2001).

Isabelline Wheatear *Oenanthe isabellina*

Months. September–April, boreal winter visitor; common most years.

Notes. Most frequent October–February, occurring in all open habitats to 2200 m, sometimes more common than Northern Wheatear, and dominant over the latter (Leisler *et al.* 1983). Common elsewhere on the plateau (Olson *et al.* undated MS, Lewis & Pomeroy 1989) and about Lakes Baringo and Bogoria to the W (Stevenson 1980, Hartley 1986). As Leisler *et al.* (1983) showed, these N visitors hold “territories” against one another, and against other wheatears; they usually are dominant over others. When moving about, either migrating farther S or seeking better foraging, may not always aggress at one another. We have seen up to three within 100 m, with no aggression, and one was near three Northern Wheatears 8 December 1996 along the S border of the area. Its pale color, large size, more upright posture and tail pattern distinguish it from F Northern Wheatears; we did not stop to identify all wheatears so wheatears are under-reported. Sometimes probes into elephant dung piles, presumably for insects. Our September records are

from 20 September onwards, except for one observed 12 September 1989 at Posho Corner and, likely same individual, near acacia crossing 13 September 1989. It passes through (and overstays to an extent in) Egypt from mid-July and to late May (Goodman and Meininger 1989), so expected in Kenya in small numbers during September and all of April (most leave by March, with one record of a likely M on slope of GMF 22 April 1995). Occurs regularly to 2200 m (Short *et al.* 1990).

Northern/Common Wheatear *Oenanthe oenanthe*
Months. September–April, one record 2 May; common Palearctic migrant and visitor.

Notes. The commonest wheatear usually, if only because it occurs in more grassy and bushy areas (such as the edges of woods) than does Isabelline Wheatear; it also occupies dry, degraded habitats and short grass where the Isabelline is at home. More often near the shoreline of dams and in grassy areas nearby. Forages at times with larks, pipits, guineafowl and serins. Is aggressive and territorial on its boreal winter quarters, but subordinate to Isabelline Wheatears (Leisler *et al.* 1983). Sometimes in pairs, less frequently in loose groups of up to four. It is often a crepuscular feeder, active along roadsides before daybreak and at dusk, and sometimes roosts on the road. It frequently appears as early as September; we have observed it eight times in early September (from 8 September), including four noted along the main road across the study area 12 September 1987 (near acacia crossing and in South Boma). Late records are to 21 April, except for a M in GMF 2 May 1995 (it passes S through Egypt as early as mid-August, and northwards in Egypt into June, Goodman & Meininger 1989). It is common throughout the highlands (Olson *et al.*, undated MS, Lewis & Pomeroy 1989) and W of the study area around Lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986).

Capped Wheatear *Oenanthe pileata*

Months. September, one record.

Notes. Unexpectedly a rare bird in the area, providing no opportunity to observe its relations with congeneric Palearctic wheatears. One record, by Sassoon, A. and J. Start and Horne 4 September 1968, and only seen twice in open country S of the study area during the 14 years. Olson *et al.* (undated MS) had a March record from Mutara, E of the study area, and it occurs to the W at Lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986). Mainly a highland bird its numbers may be diminishing (Lewis & Pomeroy

1989, Keith *et al.* 1992), or perhaps grassland areas are too limited and grass growing too tall in its preferred breeding season (April–June, big rains; Brown & Britton 1980).

Pied Wheatear *Oenanthe pleschanka*

Months. September–February, April; uncommon, probably regular Palearctic visitor.

Notes. About three dozen records (one M at Olari Nyiro Springs 1–15 February 1988 counts as one record), all in late October–early February, except for a typical M (see Cramp *et al.* 1988) on the wall of Big Dam and Dirty Dam on 11 and 16 September 1989, and two MM, one more buffy, the other whiter on hilly slope of GMF after a rain 5 April 1993. It is more often seen about dams and in wet low grass than are the two other Palearctic wheatears. Most of those noted were of MM, distinctive enough to cause us to stop, rather than FF that could pass for FF of Northern Wheatear through dusty windows of a moving vehicle. S. Sassoon has also seen it in the study area during December and January (dates not provided, *in litt.*). None was seen near more common Isabelline Wheatear and Northern Wheatear (the Pied and Northern are usually the more upland species of the Palearctic trio, Lewis & Pomeroy 1989, but we saw no lessened numbers of Isabellines, even up to 2200 m). The dominance of Isabellines and Northerns over the Pied (Leisler *et al.* 1983), and the abundance of the former two in the study area, may restrict the Pied Wheatear's occurrence there.

Northern Anteater-/Anteater-chat *Myrmecocichla aethiops*

Months. January, April, June–July, September; uncommon resident just S of study area.

Notes. Seen frequently by those entering and leaving the area by the Main Gate, near or at the gate (C. and R. Francombe, *vide* S. Sassoon), in the Main Gate area 17–30 September 1981 (S. Sassoon), and observed there 5 September 1968 by Sassoon, J. and A. Start, and Horne. Also occasionally found at Nglesha by the Francombes, and noted between open fields and woodland edge there three times by us (13 April 1995, 8 April, and 14 July 1998). The only record elsewhere is an adult observed W Dirty Dam 29 June 1990. Its scarcity in the area reflects sparse termite mounds and roadside earthen walls (in which it excavates nests), and its greater abundance to the E (and S) of the study area shown by Lewis & Pomeroy (1989); resident on Mutara Ranch (Olson *et al.*, undated MS) to the E.

Common/European Rock Thrush *Monticola saxatilis*
Months. November–April, mainly December–January; Palearctic boreal winter visitor in small numbers.

Notes. More or less regular, more numerous perhaps in wetter years, observed in open areas with scattered bushes and trees throughout the study area. Usually below 1500 m according to Lewis & Pomeroy (1989), but we have more than 70 records; as many as four individuals on one day (27 December 1996), and also seen casually about Nanyuki at 1950 m. We noted associations with various terrestrially feeding birds, as pipits, wheatears and larks. One eating *Canthium lactescens* fruits in the tree 12 January 1995; one also spent 3 min methodically rolling a 3-cm long caterpillar on the ground before eating it W Kuti. We have 20 or so, including likely, but unproven birds seen twice or more (one on GMF slope 15–23 April 1993, presumably one M), for April, the latest date being 23 April, all from four years 1993–1996. In the open areas about CS we netted a first-year M (59.5 g, worn immature wings 117.5 mm) 9 April 1994; it had a streaky M-like head, more than normally marked underparts for an adult, the worn primaries and secondaries of an immature, and much white in the rump (a M feature, Svensson 1984; see Cramp *et al.* 1988). We had eight records 16–23 April, including a fully singing M N Kuti 16 April 1994. Reports from Eritrea (Cramp *et al.* 1988) and Egypt (Goodman & Meininger 1989) include records into mid-May, and E highland breeding adults may not reach breeding areas until June, so Kenyan records into late April are not unexpected.

Olive Thrush *Turdus olivaceus*

Months. Common resident in well-wooded S sites.

Ecology. Resident in woods at S sites (N to CS, wanderers to Center and GMF), where African Thrush also occurs, occupying woodland interior and adjacent thickets, with African Thrush more at edges of woods and thickets nearby (Short *et al.* 1990, Keith & Urban 1992). One visited Center for *c.* two months February–April 1994, and drank in water sprinkler spray. Seen feeding on olives *Olea europaea* and on fruits of *Rhus* sp.

Movements. Only in dispersal, e.g., to Center garden (above) and GMF (late January–early February 1998, at water bath).

Behavior. An aggressive thrush, one dominant over African Thrush at Center water sprinkler. Much less readily observed than African Thrush, as it stays in cover; here not the rather tame bird of suburban gardens about Kenya's cities and towns.

Voice. Song an easygoing, clear series of up-down “tee-too, tee-too” notes, usually very short (under 5 s, see Urban *et al.* 1997); sometimes more complex, including mimicry of Violet-backed Starlings and other birds. Call a *Turdus* “shreek” or “skeek,” less shrill than that of the African Thrush. Songs heard most months but especially April–August and December–January.

Breeding. Brown & Britton (1980) had breeding records from all months from the region including our study area, and given the three rainy seasons and irregularity of substantial rains, over time this thrush likely has bred in every month. However, peak singing in May–June and to a lesser extent December–January suggest breeding concentrated in those periods, following the big and little rains. We have seen active nests, fledglings, carrying of food and cloacal protuberance/brood patch evidence of breeding April–June and November–December; one fledgling seen in September (suggesting breeding in July–August rains), and subadults handled in April and December suggest breeding *c.* December and perhaps August–September for parents of those subadults. The four active nests were at 3.5–10 m in densely-foliaged trees (*Euclea* sp. two, *Rhus* sp. one, one unidentified tree). Unlike many species of *Turdus*, this thrush in our area appears not to regularly use mud in building its nest (van Someren 1956 mentioned no mud, *contra* Maclean 1993 and Urban *et al.* 1997). The outer nest consisted of small twigs, rootlets, leaves and mosses, and the lining was of fine tendrils and plant fibers. One nest at 8 m was situated inside and at the bottom of a broken old arboreal termite nest, thus on a “shelf” with the broken top of the termite nest providing some shelter. Those we could observe closely contained two eggs or two young only. Eggs were pale green-blue with rusty, purplish and greenish spots, some concentrated in patches; one clutch measured 26.25 x 19 mm and 26.5 x 19 mm (these had been abandoned, and contained well-developed dead embryos, perhaps 11 days incubated in December 1993).
Specimen data. A total of 18 were netted at five of the sites noted above, in January, April–June, September–October, and December. Two adults were not weighed and measured. Of the 18, two were subadults, five were MM with an obvious cloacal protuberance, two were FF with a brood patch, and only four were obviously molting (a low proportion, suggesting that molt is rapid). Nine unsexed adults weighed 60–74.5 g (mean 65.4 g), five MM were at 61.5–68 g (mean 64.6 g), the two FF were 63.5 and 65.5 g, and the subadults were 57.5 and 61.5 g. These

were higher than those of this race, *T. o. abyssinicus*, given by Urban *et al.* (1997) and more in the range of those given by Clement & Hathway (2000), and for Nandi, Kenya, by Schifter & Cunningham-van Someren (1998). M wing lengths were 110–121 mm (mean 115.4 mm), the two FF had wings at 110 mm, and seven measurable, unsexed adults were 109–116 mm (mean 113.1 mm), which tends to support the slightly larger size (weight, wing length) of MM. MM also have blacker lores and more black, less gray-brown markings on the (white) undertail coverts than do FF (and MM are more brightly colored on the breast and in soft-part colors). Soft-part colors: Bill variable, rarely yellow, red-orange to orange in M, orange, pale orange, gold-orange or dirty orange in F (often dirty, may be orange with yellow tip); mouth lining orange to gold-orange, more orange in M than F; orbital skin almost a wattle, orange to yellow-orange in M, yellow-orange to yellow in F; eye umber brown or dark brown; legs, feet, toes and claws uni-colored, orange to dirty orange or yellow-orange. One subadult had bright soft-part colors, about as in adult M, except for dull orange legs with brownish edges of scales on toes. Both sexes, but especially MM, differ from African Thrushes in their more orange soft-part colors, brighter and larger orbital wattle, blacker lores and more continuous, brighter orange-rusty underwing coverts–sides–belly. These differences were not clearly shown by Zimmerman *et al.* (1996) and Urban *et al.* (1997), and hold for the local races (*T. o. abyssinicus*, *T. pelios centralis*) in their areas of sympatry across the Laikipia Plateau to the suburbs of Nanyuki.

African Thrush *Turdus pelios*

Months. Common resident throughout the area (netted in all months).

Ecology. The common *Turdus* thrush, occupying all areas of woodland, riverine woodland and edges, thickets and dense bushland. Where sympatric with Olive Thrush in S of the study area, occurs in more open woodland, woodland edges, thickets and nearby bushland than does that thrush. It is a resident about GMF in bushland and degraded woodland, and indeed was present at all study sites. Water is an attractant, as at GMF camp and about habitation (Kuti, Center, Nglesha Center), but it occurs at PK (Fig. 17) in the usually dry lugga, at FS where water is usually absent, and in dense woodland about KS and OD, which normally are dry. More often forages in the open than does Olive Thrush at sites where both occur. Sometimes feeds in recently burned bushland.

Forages by kicking leaves aside, peering, probing and moving on. Eats worms, insects, figs, olives (10 fed in one olive tree at SI in July), *Carissa edulis* fruits; hawks winged termites and seen eating nematode worms. Sometimes forages in mixed-species flocks. Also digs into elephant dung, foraging in it, as well as using it in nest construction.

Movements. There is no indication that it moves, other than in dispersal.

Behavior. Occurs on large territories at poorer sites, as GMF, where two MM rarely occur, whereas three territories regularly maintained at MB, EG and SI; perhaps territories 4 to 10 or more ha. Interacts casually with other species. The African Thrush is submissive to Olive Thrushes, as evidenced by several interactions. Dangers of feeding and drinking in the open were made clear by the swift attack of an African Little Sparrowhawk on a drinking African Thrush in water below the spring SE of EG; the thrush was killed and, with difficulty, carried off by the slightly larger hawk. Other than M-M and a few F-F chases we observed no displays by these often secretive birds.

Voice. The song is longer and more complex than that of the Olive Thrush (Urban *et al.* 1997), and more frequently contains mimicry, as of voices of such diverse species as the Crowned Eagle, Crowned Lapwing, the piping song of the Scaly-throated Honeyguide, the song of the Greater Honeyguide, and a number of passerines. Some mimicked songs may be local, e.g. the VIK-TOR song of Greater Honeyguide was heard regularly from it at NG and several times at nearby PO. Songs heard mainly April–July, to a lesser extent in August and January, and rarely in September and December. They are uttered from the top of bushes or trees, including tall *Acacia xanthophloea*, most often early and late in the day; they can be heard all day in the breeding period, when this thrush may sing before dawn (05:45–:55 h) and as late as dusk (19:00–:05 h). The call note is a typically *Turdus*-like “skeek” note, rather shriller than that of Olive Thrush, and perhaps louder. Also utters a chattering trill, a series of “tik” notes, apparently in alarm, as at a boomslang *Dispholidus typus* (snake) at GMF.

Breeding. The major breeding season is April–July (big rains to July–August rains), with a minor November–January peak. Brown & Britton (1980) had no records for the region (“D”) represented by the Laikipia Plateau; indeed Zimmerman *et al.* (1996) and Urban *et al.* (1997) indicate its eastward limit as the Rift Valley and W Laikipia Plateau, although it is resident at least

as far SE as Nanyuki, where commonly about our home. Nests date entirely May–July, dependent fledglings May–August, immatures (independent of parents) from May–September and November–December, and subadults September–May. Netted, sexable thrushes with obvious cloacal protuberance or brood patch, date April–July (24), September (one), and November–January (three); and songs, including all those with mimicry, date April–September and December–January. Perhaps more strictly seasonal than elsewhere (Brown & Britton 1980, Clement & Hathaway 2000) because of irregularity of rainfall generally in the study area, and its common need for mud, thus water, for nesting. An immature fairly recently fledged but independent foraged without being chased by adults beneath a tree in which a pair were building a nest 20 June 1992 at LU, suggesting that this thrush occasionally may be double-brooded. Most of *c.* 12 active nests were too high (3.5–10 m) for us to examine; but were bulky, and seemed to contain mud, or in one case (at least), elephant dung, as well as twigs, rootlets or fibers and grass stems. None seemed to produce more than two young. Most adults molt May–September; of 29 adults handled October–April, only one was in molt (in February). Of five adults that we banded and retrapped two or more years later, one was netted seven years later and another nine years later (the last a F, was mated and breeding 25 May 1994 in LAT, having been banded at MK 18 November 1985).

Specimen data. Some 80 individuals were netted; a few escaped or could not be checked thoroughly due to the press of other work. They include: 28 unsexed adults not obviously molting, seven molting adults, 20 adult MM, eight adult FF, five immatures and 10 subadults (“immatures” are fully or essentially juvenal-plumaged individuals assumed to have fledged recently; “subadults” are mostly adult-plumaged individuals still showing immaturity in spotted wing coverts, and assumed to have fledged more than two months earlier). The weights with sample size, range and mean are: adults (27) 48.5–78 g (62.4 g); molting adults (six) 56–65 g (60.5 g); adult MM (20) 57.5–74 g (64.0 g); adult FF (eight) 52.25–65 g (58.2 g); two immatures 56.5 and 56.75 g; and subadults (eight) 52.5–62.5 g (58.5 g). For wing length the samples are: adults (26) 100–122.5 mm (112.2 mm); molting adults, one at 119.5 mm; adult MM (18) 112–118 mm (115.8 mm); adult FF (seven) 105–120 mm (111.3 mm); no immatures; and subadults (seven) 104–113 mm (108.4 mm). These data show

MM to be heavier and longer-winged than FF, and adults, heavier and longer-winged than immatures and subadults. They seem to agree with data Urban *et al.* (1997) had available for *T. p. centralis* (see also Clement & Hathaway 2000). They also indicate very close similarity to weight and wing-length data for the Olive Thrush, which is, however, a chunkier bird with shorter legs and a shorter bill than African Thrush.

Soft parts: The bill is often dirt- or mud-caked, beneath which it usually is pale yellow to gold, and rarely pale orange, never red-orange; culmen may be dusky and cover over the nostril often is dusky to gray. Immature bill mainly horn to (maxilla) yellow-horn, with dusky about base and on mandible and tip of bill. The mouth-lining is yellow to yellow-orange; bright yellow with pink rear in one immature. The orbital skin very narrow, not forming a wattle, but bare skin extends rearward from the eye, at times almost like that of lowland Bare-eyed Thrush *Turdus tephronotus*; it usually is dully-colored yellow to orange, occasionally brownish, and brighter in MM than FF. The post-orbital bare area is gray to slate or blue. The eye is brown to amber brown, paler than in Olive Thrush; outer edge often with tan, orange, yellow-orange or gray. Eye gray-brown in immatures. The legs are dully-colored, always pale, buff-yellow, to orange. An immature had legs pale gray in front, yellow behind, pink on sides; the feet are as the legs (pale gray in the immatures). The claws are pale yellow to orange. Overall, African Thrushes look lanky, less compact than Olive Thrushes, and are paler; African Thrush's paler, longer bill, narrower orbital skin, bare area behind the eye, and pale lores, not properly emphasized in books we have seen, help distinguish it from Olive Thrush.

SYLVIIDAE Warblers, cisticolas, apalasis, parisomas

Sedge Warbler *Acrocephalus schoenobaenus*

Months. January, April; three records, casual Palearctic boreal winter visitor and migrant.

Notes. Seen in dense bushes by Center Dam by S. Sassoon on her April 1983 visit. On 18 April 1994 one foraged for 0.5 h around water baths beside our banda at GMF, its puffy white superciliary line and streaks clearly seen at 1–5 m away. One foraged in dense bushes along the SE lugga of EG 13 January 1995 in a mixed-species flock including *Camaroptera*, *Apalasis*, and *Sylvietta* warblers as well as *c.* 20 other species. This relatively common visitor is widespread in Kenya November–April (Lewis & Pomeroy 1989, Urban *et al.* 1997).

Eurasian Reed-warbler *Acrocephalus scirpaceus*

Months. Certainly January; likely casual Palearctic boreal winter visitor.

Notes. One definite record 4 January 1988 at our feet in a blind along the river at MK, richly colored with a rusty rump, dark claws, a vague whitish buff eye-ring and superciliary stripe and dark legs. At the time we used Williamson (1968a), Moore (1983), and Svensson (1984), in addition to the common European field guides, in checking Palearctic visitors, and this individual seemed to agree with features of *A. s. scirpaceus*, with which we are familiar. Other possible sightings of the E race *A. s. scirpaceus* in January and April of 1987–1989 could have represented Marsh Warblers, or possibly even African Reed-warblers *A. baeticus* (by error this species was inadvertently listed instead of the Eurasian Reed-warbler in Short *et al.* 1993), but were not sufficiently studied to give us certainty of their identification at that time. The study area is at the usual extreme E edge of the Eurasian Reed-warbler's main range in Kenya (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996, Urban *et al.* 1997), although Stevenson & Fanshawe mapped it for all of Kenya. It does occur just W of the area at lakes Baringo (February–April) and Bogoria (Stevenson 1980, Hartley 1986), and in small numbers in highland central Kenya, usually below 1800 m, reaching the coast (Zimmerman *et al.* 1996) at times.

Marsh Warbler *Acrocephalus palustris*

Months. November, December, April, four records; casual Palearctic boreal visitor and migrant.

Notes. Suggesting that some of our earlier observations of small brown *Acrocephalus* could have represented this species, we netted a Marsh Warbler 21 April 1993 at GMF and observed individuals we are confident were Marsh Warblers 18 November 1993, 7 December 1994 and 18 April 1995, by which time we had Hollom *et al.* (1988), Harris *et al.* (1989), Parmenter & Byers (1991), and Cramp *et al.* (1992), as well as better general guides (Maclean 1993, Peterson *et al.* 1993) actually in the field with us. Major distinguishing features of these individuals were: a distinct, even large area of white feathering around the orbit and as a superciliary line; the rather dull brown upperparts having an olive tone; a yellow tone to the pale underparts; a well-defined dark brown alula; and, in both April birds especially, broad whitish tips of the primaries and other flight feathers. The warbler netted at GMF showed all these features and more: it was yellowish buff under the tail, as well as yellowy white

generally on the underparts; the notch on primary 9 was at the level of the tip of primaries 4 to 5 (thus, short notch compared with the Eurasian Reed-warbler's see, e.g., Urban *et al.* 1997); legs were pale yellowish brown; and claws pale yellow-pink with horn along the top. It weighed 13 g and wings were 66 mm; also the longest claw (hind claw, toe 1) was 6.9 mm and culmen to nostril feathering was 10.8 mm. This Marsh Warbler was netted near the camp water (bird baths), and indeed the warbler seen at GMF 18 November 1993 also foraged extensively about the bird baths. The 7 December 1994 Marsh Warbler foraged beside us in a thicket at TA as we were handling honeyguides; it approached us closely (2.5 m), allowing extended observations. The 1995 individual called a sharp "tsik" and perhaps a double "tsik-ik" at us, as it appeared to forage hesitantly at 2.5 m in leleshwa bushes close to the camp building (and 15 m from the bird baths, the only water nearby). All were presumably migrants, as none was seen again (November–January and March–April records are considered migrants, e.g., by Zimmerman *et al.* 1996). This warbler usually occurs at lower elevations than in the study area, but also visits the highlands west to the Rift Valley (Urban *et al.* 1997, Stevenson & Fanshawe 2001; the latter considered it as very common), and can be abundant at times. We photographed the netted Marsh Warbler.

Great Reed-warbler *Acrocephalus arundinaceus*

Months. April, December, two records; casual migrant or Palearctic boreal visitor.

Notes. This huge reed-warbler was seen foraging in lush tall grass with a few reeds in the edge of the stream with thickets and woodland about at NG 26 December 1988. It was more buffy below and more warmly colored above than the other one that we netted 26 April 1994 at KS in bushy clumps at the edge of woods. The latter weighed 39.5 g, and was heavy for its measurements (wing 88 mm, tail 71 mm; Cramp *et al.* 1992, Urban *et al.* 1997). It was warm brown above with some rusty (rump), but quite white below (slightly buffy sides, more yellowy buff flanks); the lower throat was slightly streaked. Its mandible was yellow-pink, with a pink base, and the mouth lining was orange-pink. The Nglesha site is at 2000 m, well above the 1600 m limit noted by Lewis & Pomeroy (1989), and the KS site is above 1850 m. We identified the netted warbler as of the nominate race, but of the paler, less rufescent extreme, rather than of the Asian race *A. a. zarudnyi*, which is grayer

above and paler below (the races intergrade making determination difficult, Cramp *et al.* 1992; see also Urban *et al.* 1997). We have photographs of the netted warbler.

Olivaceous Warbler *Hippolais pallida*

Months. October–January, April–May; probably regular in 1980s, casual thereafter.

Notes. Observed at MK, EG, SI and TA, scattered but with tall acacias about these sites (Urban *et al.* 1997), favorable for this common Palearctic boreal visitor and migrant. One October record, 17 October 1992, most records November–December, with one April and a late one 5 May 1995 (seen well in *Acacia abyssinica* trees at SI, Fig. 12); it passes through Egypt as late as May (Goodman & Meininger 1989). At least one was at EG 1–25 December 1989, seen when visiting there in that period. At MK 10 December 1983 one pursued a Red-fronted Tinkerbird about several *Acacia xanthophloea*. Seen but four times after 1990, for unknown reasons common in 1980s. Lewis & Pomeroy (1989) considered it a mainly November–April visitor below 1900 m (our localities for it are 1737–1900 m).

Icterine Warbler *Hippolais icterina*

Months. One November record of this Palearctic boreal visitor.

Notes. A distinctly yellowish (throat, sides, undertail) *Hippolais* warbler in MK fever trees 4 November 1985 was judged to be an eastern migrant of this species (Cramp *et al.* 1992, Urban *et al.* 1997; features used by Svensson 1984 checked in field). It had a buffy yellow superciliary line, no eye line before the eye, and a faint white “panel” in the wing, Lewis & Pomeroy (1989) mentioned only 14 records, but Turner (1993) noted November and December records for 1991 E to Marsabit, Lake Baringo, and Ngulia, and small numbers in E Mara Game Reserve during that December, so can be more than a straggler (Zimmerman *et al.* 1996 mentioned records E to Nairobi and Mombasa, and Stevenson & Fanshawe 2001 called it uncommon in E Kenya). It is the only likely yellowish *Hippolais* warbler in Kenya.

Rattling Cisticola *Cisticola chiniana*

Months. Common resident.

Ecology. Common in bushy cover with some bare ground; in thickets and edges of woods, and stream-side bushes and shrubbery incompletely covered by tree foliage. It occurs at all of our sites, but was rarely netted, partly because it avoids woodland, and be-

cause, as a resident foraging on or near the ground, it likely was aware of our nets and permanent net lanes. Where occurring with Boran Cisticola, the Rattling occupies more bushy woodland edges and thickets; the Boran Cisticola is along more rocky, partly open and grassy slopes or flatter degraded bushland and bushed grassland. Both overlap with the Siffling Cisticola, which favors intermediate conditions with tall grass. The Rattling also forages in burnt-over bushed grassland, and invades woods that have been severely burned and opened up. Where overlapping only with Siffling Cisticola, the latter is in more grassy, open areas (their territories overlap, larger Rattling Cisticola is dominant over its smaller relative). The Rattling usually feeds on or near the ground, and is more evident than the others by virtue of its aggressive calling. It occasionally hawks for insects, especially flying termites. One fed on hanging carcass of a cow in the butchering shed at Center. Joins mixed-species flocks. Does not move, except to disperse.

Behavior. Its harsh chatter challenges human intruders and predators, and is a familiar sound wherever it occurs. It is one of the prominent species mobbing snakes and other predators. It even sings repeatedly as a challenge to owlets being mobbed by birds as orioles and white-eyes, the F perched nearby as the M sings. Flicks wings and tail as it sings, and cocks tail when fighting; aggressive to conspecifics and frequently supplants Siffling Cisticolas. It also calls shrilly at FF of Diederik Cuckoo, which has been known to parasitize its nest (Fry *et al.* 1988), and at Fiscal Shrikes perching near cisticola’s suspected nests. In M-M encounters fights aerially at times; also tends to fly in display, flapping its wings exaggeratedly (flight displays are not noted for it by Maclean 1993 and Keith *et al.* 1997). Little has been seen of courtship.

Voice. The song is mainly an elaboration of calls, the main one of which is a harsh “ch-ch-ch” (or “tch-tch-tch”) to a clearer “jee-jee-jee” (or “chee-chee-chee”). The harsher version of this call is used against human and other intruders; both versions may form the first (sometimes the second) part of the song, followed by a faster trill “chchch.” The “jee” version can be confused with “dee” calls of the White-bellied Black Tit. Songs vary (Urban *et al.* 1997); common in our area are such as “dya-dya-dya, cheew-cheew-cheew-cheew,” “che-che-che-che-chiteecha,” “jee-jee-jee-jee-chchchchch” (or the two parts may be reversed), “she-ree, she-ree, chipipipip,” and “cha-cha-cha-cha-cheea-

cheea-cheea.” May wing-flip as it sings. At times full songs may contain a more melodic trill as an ending, but not all contain clear rattling, *contra* Stevenson & Fanshawe (2001: 386). We have heard songs in every month, but long bouts of repetitive singing occur mainly April–August. “Chea-chea” calls were uttered by a F chased by a singing M. Other calls are a “rak-rak,” and series of single or double “tchow” notes. In display flights the “bdddtdt” loud sound of the wings can be heard.

Breeding. Dependent (fledgling) juveniles have been seen February, April, and June–September, with about half the records in June–July. Three February records, with flight displays and aerial song in that month suggest December–February breeding in some years. Four active nests were found May–June. Thus, breeding is during and after the big rains – July–August rains, with some breeding late in or after the little rains, as data of Brown & Britton (1980) suggested. Nests were as described by Urban *et al.* (1997) and Tarboton (2001), namely a grass-woven ball with a side entrance just above (4 cm, 7 cm) the ground, situated between two small bushes. The two clutches we saw closely were comprised of three and four unmarked, pale blue eggs (eggs were glimpsed but not seen adequately in several other nests). Bob-tailed, newly-fledged young were in groups of two-five, the clutch size in East Africa (Urban *et al.* 1997).

Specimen data. Two adults were netted and checked, one apparently a F at 14.25 g in weight, molting and with a faintly streaked rusty, non-breeding crown (Lynes 1930, Urban *et al.* 1997), the other a breeding M at 21.75 g in weight (wing 69 mm, worn tail 63 mm), the first from EG 29 August, the M from MB 25 May. In addition to the black mouth lining, the M had a fully shiny black maxilla, even along the tomia to the rictus (see following species); its crown was browner with well-marked streaks. The eye of the M was darker, chestnut-brown, that of the F being orange-brown; legs were pinkish in the F and orange-pink in the M. Another M was netted at Kuti 4 August, and had a wing length of 65 mm, but it escaped before it could be more closely examined. They represent *C. c. humeralis*, the central Kenyan highland race.

Boran Cisticola *Cisticola bodessa*

Months. All but March; common resident locally in NW section of study area.

Ecology. Found at four study sites (MB, PK, UL, ML), and generally about the Lugga Maji Nyoka, High Boma, the valleys NW of MB and irregularly S to the

Mukutan River (about Python Pool, and MK-LAT sites) at elevations of 1720–1950 m. Its habitat varies. At PK up to five pairs occupied a rolling slope N of the lugga (which is inhabited by Rattling Cisticolas) in rocky, open land with patches of grass, some bushes and scattered low trees (Fig. 17). About the Mukutan it is on rocky, steep slopes with patches of bushes and grass. Where grass becomes heavy and dominant it gives way to the Siffling Cisticola (the two overlap), and where bushes become thickety and clustered, it gives way to the Rattling Cisticola (they do not actually overlap, and in our area the Rattling and not the Boran occupies more dense bushed habitats, *contra* Urban *et al.* 1997). To the S and E, where the land is less hilly overall, its habitats seem occupied by Rattling Cisticolas. Because habitat of Boran Cisticola is outside of that used by honeyguides, we netted only one, in an ephemeral situation at the MK site.

Movements. Difficult to determine such, as it is quiet and stays in cover when not breeding. Likely resident in part at least, may be local disperser, as in the case of pair seen at MK.

Behavior. Poorly known. Shyer than Rattling Cisticola, does not challenge human intruders as readily. Sings with enthusiasm, flicking wings and tail, as Rattling Cisticola. There may be a tendency for this cisticola to sing from higher perches than does the Rattling, as Urban *et al.* (1997) stated, but in our experience the Rattling Cisticola sings from the tops of bushes and trees to at least 9 m, as does the Boran.

Voice. Call a hard “chip” or “chit,” in alarm a fast trill, “chit-chit-chit-chchchchit” (end may be “chipipipipip”). Song, heard April–October and December–January, commences with several “chip” notes increasing in tempo (rarely a “chip-ip-ip-ip,” nearly a trill) into the very rapidly uttered, often melodic and up-down in tone, short song itself. Some examples are: “chip-chip-chewee, tchee-teedle-weedle;” “chip-chip-chip-chippydeeyittedeeyoo;” “chip-ip-ip, wee-oo, wee-too;” and “chip-ip-ip, wee-tee, la-wee-tee, wee-too.” The rapidity of the song itself and slow-to-fast “chip” introduction render the song distinctive; it lacks the harsh, chattery quality of the Rattling’s song, and is reminiscent in quality to songs of the American vireos *Vireo gilvus* and *Vireo bellii* and that of the greenbul *Andropadus importunis*. The M we netted called a whistle “peep” in hand, and sang as we released it, and sang on thereafter (F nearby). Songs were heard from more than a dozen localities, all along the Lugga Maji Nyoka to its mouth on the Mukutan River, and adjacent luggas and valleys. The songs usu-

ally are uttered at *c.* 3 s intervals in a group of three to 10 songs, followed by a pause of up to a min, then are repeated. Most singers were at the tops of bushes and trees such as *Acacia gerrardii* at heights of 4–7 m (extremes 1.5–9 m). Songs were heard as early as 06:15 h, and were concentrated in mornings and late afternoons. Abbreviated songs with one “chip” and only a short phrase thereafter were heard in September and December. The “chip” or a sharper “pit” in irregular series is a major call.

Breeding. From countersinging MM at PK we estimated territories at *c.* 2 ha. We have no direct evidence for breeding, but countersinging and extensive bouts of singing occurred April–August, in October 1992, and in January 1992 and 1995, suggesting breeding during and following the big rains into the July–August rains (April–August), and in some years perhaps during and following the little rains (October–January).

Specimen data. A singing M (accompanied by its likely mate, Fig. 18) was netted in bushes on steep slope

above the river at MK 3 January 1990. It weighed 19 g, and had wings 62 mm, tail 61 mm, exposed culmen *c.* 12.5 mm and tarsus *c.* 26 mm; it was in molt (primaries 1–7 new, outer 3 old, rectrices mixed). Its rufous cap was finely streaked brown (*contra* Stevenson & Fanshawe 2001), and the back was grayer brown than in Rattling Cisticola; the back appeared mottled (Zimmerman *et al.* 1996) because streaks are broad and dark brown grades into paler outer feather vanes (Rattling is much more cleanly streaked). The face was essentially unpatterned pale gray with some buff in the lorés and some brown on the rear of (worn) ear coverts. Photos were compared with those of several Rattling Cisticolas, and with plates of Lynes (1930), Zimmerman *et al.* (1996) and Urban *et al.* (1997). The bill was medium brown about the culmen, horn along the tomia from near the tip of the bill to the rictus, and pink-horn on the basal 60% of the mandible. The gape was black, contrasting with pale tomial line (Fig. 18); breeding MM of Rattling Cisticola have a shiny black culmen, and tomia to the



FIG. 18. Boran Cisticola *Cisticola bodessa* M (black mouth, singing) netted 3 January 1990 at the MK site. The singing M was accompanied by a F in a grassy, degraded area just S of the honeyguide-feeding site beside the track. Note the rather unpatterned face, pale (horn) area along the basal bill tomia, and heavy, dark back-scapular streaks (see text).

rictus. The eyes of the M Boran *Cisticola* were umber brown with a hint of yellow (eyes of MM of Rattling *Cisticola* are “warm,” i.e., reddish-or chestnut-brown). The legs and feet were bright pink to the nails, which were dusky horn above and horn-pink below; the rear of the legs was more horn-colored (Urban *et al.* 1997 gave the “feet” as pale brown, and also the eyes of this *cisticola* as chestnut-brown).

Winding *Cisticola* *Cisticola galactotes*

Months. July; one record; vagrant.

Notes. A large *cisticola*, very clearly marked black (streaks) and buffy on the back, with a clear russet crown and mainly rusty tail, foraged in grasses and the bases of bushes at the water's edge of Big Dam 24 July 1987; it showed some buffy below, and a near russet patch in the primaries. Likely it was a non-breeding-plumaged wanderer from the highlands S of the study area (Lewis & Pomeroy 1989), or possibly an upslope wanderer from Lake Baringo (Stevenson 1980), where it breeds May–June. There is little suitable waterside vegetation for this *cisticola* in the study area, the water's edges being too densely wooded, or bare and fluctuating greatly; possibly habitat exists for it S of Nglesha Dam or in the lower stream below Nglesha Center.

Siffling/Short-winged *Cisticola* *Cisticola brachypterus*

Months. Common to abundant, mainly resident.

Ecology. In habitat ranging from grassland (tall grass) with scattered bushes to degraded (often burned) wooded and bushed grassland, to degraded bushland with patches or openings that are grassy and grassy edges of woodland, this is the commonest *cisticola*. Where the grass is minimal and there is much bare ground it yields to the Rattling and Boran *cisticolas*; in very (limited) extensive tall grass gives way to Pectoral-patch and (rare) Zitting *cisticolas*. It replaces Rattling *Cisticola* after burning of woodland edges, even moving into the bottom of burned out luggas when grass has grown (as e.g., at the MB site between 1988 and 1991). In its habitat after good rains as many as seven singing MM can be heard from one point, and up to five (more usually three) could be heard at times from our camp at GMF. At least forages in cornfields, where heard singing at Nglesha. It is difficult to observe foraging, much of which occurs on the ground. Can hang upside down foraging in leaves of bushes, and noted hawking termites from bushes after emergences. Occasionally feeds in mixed-species foraging flocks. Eats insects including diverse larvae to c. 2 cm in length. When not breeding, can be seen

and heard calling as they go to roost. Often four to six roost near one another in a 25–30-m² area, using dense bushes amid dry, hanging leaves of *Croton dichogamus* at 0.5–1 m above ground. Sites occupied throughout the area were at 1750–2150 m. Like the Rattling *Cisticola*, common in highland Kenya (Lewis & Pomeroy 1989).

Movements. It is difficult to establish whether or not it moves beyond dispersing; numbers are fewer in dry years when perhaps marginal areas lose their grass and become essentially bare and are then avoided by this *cisticola*. In years of average and better rainfall vast numbers of immatures and subadults are flushed from grassy areas. We think most movements are local only. *Behavior.* Little observed, except for singing; usually inconspicuous, and supplanted by larger Rattling *Cisticolas* when readily visible in jointly occupied habitat. Sings from top of bush or tree to 10(–15) m. It occasionally sings in flight, and once two were observed flying in circular pattern at 110–130 m; both sang and the near bird was seen to drop straight down to a tree and commence singing from there, thus flight display does occur in *C. b. katonae* (Lynes 1937); also see van Someren (1956) for flight songs/displays.

Voice. The “siffling” song responsible for its name is of two simple types: a straightforward “chip-chip” (to “twit-twit” or “zeet-zeet”) of up to c. 20 identical notes at c. 1.5 per s, all on the same pitch; and an up-down “tsip-tseep” (varies, to “tsee-sip,” “tsit-tsee,” “tik-tuk,” “tiz-zit” or “tee-cha”), double note repeated up to 10 times. The first form may be introduced by “pachee” or “cheet-cheet-zeet-zeet,” etc. Occasional are songs with up to five syllables (e.g. “tsee-see-see-tsip”). Early in the breeding period the first songs are of but two or three notes; these progressively lengthen with the season. Songs also start and end with few notes daily, with a morning buildup to full songs and a maximum song period of 06:01 h to 18:55 h (twice to 19:05 h), but usually starts late (07:00–09:00 h) mornings. Songs are in bursts of five to 12 or more, and M may switch from one type to the other. Often sings in the heat of midday. Playback elicits faster singing of longer songs. Singing usually commences between late March and mid-May; extended songs date May–August, with fewer in September–October, with a small peak December–February. Some songs were heard in all months, over the course of the project. We have heard few 3-note to 5-note phrases (see Zimmerman *et al.* 1996), but its song varies geographically (Urban *et al.* 1997). Calls heard were a “tzip” or “tzip-ip,” essentially like the notes of songs. Indi-

viduals en route to their roosting sites could be found regularly by their "peep" notes at 18:35–18:50 h many being immature and subadult individuals. One fledgling called "chee-chee" and a rapid "teet-eet-eet" at us. *Breeding.* Evidence for breeding comes from preponderance of extended songs and singing May–August (to a lesser extent December–February), active nests June–September and December, dependent juveniles May–September and January, independent juveniles June–September and November–January, and aerial and other displays June–September. Breeding is mainly May–September, and in some years December–February, thus following the big rains and into and through the July–August rains, and after especially heavy little rains. In years of good rainfall literally hundreds of immatures are evident in its habitat a month and more after breeding commences. Most nests seem to produce two or three fledglings. Because of the high risk of predation from mongooses, we avoided touching nests so did not see eggs. One GMF nest held two dead young 24 August 1996 (the young were well fed and undamaged); near six others we observed two very short-tailed juveniles, except for one case of three seen. The ball-like grass nests with side entrance (Urban *et al.* 1997, Tarboton 2001) were 7.5–25 cm above ground, in and woven to a clump of grass; the nest itself was 8–10 cm in diameter, and lined with fine grasses, leshwa pappus and tendrils. Most were within *c.* 30 cm of at least one bush or small tree (*Croton dichogamus* in two cases), and there usually were three or four of these bushes/trees within a radius of 2 m from the nest. One Nanyuki nest was constructed of grass but within a pile of cut brushwood beside a path. Fledged young roost in vicinity of the nest, but groups of up to eight or even 10 young, loosely associated, may roost in a single cluster of bushes, i.e., within a diameter of *c.* 15 m.

Specimen data. We netted but four Siffling *Cisticolas*, three at GMF about our camp. The three weighed 10.75–11.75 g (mean 11 g), all being adults. We sexed them by mouth color (Lynes 1930, Urban *et al.* 1997), MM having a gray-black, and FF a pinkish mouth lining. One M netted 27 May was in fresh plumage with wing 57 mm and tail 46.5 mm; the second M, netted with its likely mate 17 July, had completed molt (outer 2 primaries still in sheath), and had wing 52 mm, perhaps not full length. The F taken 17 July with its mate (F weighed 11.75 g, M 10.75 g) was lighter brown than the M, and was starting the molt (primaries 1–2 new, 3 out, rest old); a second F netted 27 August was in fresh plumage with wing 51 mm.

These represent the large highland Kenyan race *C. b. katonae* (Lynes 1930, Urban *et al.* 1997); it is rather more strongly streaked on the crown, and more broadly streaked on the back than shown by Lynes (*op. cit.*). We noted the sickle-shaped outer primary, and clear buffy white ring of feathers about the orbit of these *cisticolas*. Soft-part colors: The bill is brown-black on the maxilla, paling to horn-yellow on the to-mia, extending to the rictus (not showing as a blackish line against the pale face); the mandible is yellow-horn with dusky tip and dusky wash about its base. The iris is brown with a buffy central ring. The legs and feet of the birds were pink, brightly so in three, more yellow-pink in one F.

Zitting *Cisticola Cisticola juncidis*

Months. One September record in 1968, vagrant from lower elevations.

Notes. Seen at Nglesha 3 September 1968 by Sassoon, A., and J. Start and Horne, in extensive lush grass of flatland *Combretum* grassland. Anthony N. Start was particularly interested in and knowledgeable about *cisticolas*. The year 1968 was a one of heavy rainfall following an even heavier year of rain in 1967 (these two years had the greatest rainfall of two consecutive years in the entire period 1953–1998). Olari Nyiro Ranch was unfenced at the time, had far fewer elephants than in recent years (elephants have removed most *Combretum* trees), less livestock than in the 1980s–1990s, and less land cultivated, i.e., the situation was more favorable for grassland birds, and Zitting *Cisticolas* are known to move into locally lush grassy situations (Lewis & Pomeroy 1989, Urban *et al.* 1997). We have not found this species (which we know well from Europe, India and Australia) around Nglesha in the more heavily used situation (more livestock, more frequent and extensive cultivation, more elephants) obtaining in the 1980s to 1990s. It also occurs mainly but not entirely below 1500 m – where found about Nglesha the elevation is 1900–2150 m; 27% of its Kenyan range is above 1500 m, according to Lewis & Pomeroy (1989), while Stevenson & Fanshawe gave its altitude as sea level to 3000 m.

Pectoral-patch *Cisticola Cisticola brunnescens*

Months. January, April–September; likely resident in small numbers in SW.

Notes. Found very sporadically (10 records) at the edges of cultivated fields, pasture fences and short-grass pastures about Nglesha Center (Fig. 4), and once at extensive pasture N of the Main Gate. Darker,

browner, more heavily streaked than Zitting Cisticola, even more streaked and shorter-tailed than Siffling Cisticola, flight-displaying MM are very distinctive and, when perched, the dark loreal mark is conspicuous. We have heard and seen this cisticola in April–June and September about Nglesha pastures (also display-singing N of the study area, on Luoniek Ranch 13 July 1994). A molting adult with a very yellowish juvenile called (“tsik” notes, sharply) at us low on a fence there 7 August 1989, providing evidence of breeding. We likely missed it (or passed it off for a Siffling Cisticola) most of the time, as we hurried to our wooded site. Also seen there by Sassoon, the Starts and Horne 4 September 1968. It occurs to the E of the study area on Mutara Ranch (Olson *et al.*, undated MS), and elsewhere (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996). Its upper limit was given as 2000 m, about that of Nglesha, by Stevenson & Fanshawe (2001).

Tawny-flanked Prinia *Prinia subflava*

Months. Locally common resident.

Ecology. Resident throughout, inconspicuous in woodland edges, thickets (edges), thicker parts of degraded bushland, roadsides and bushier parts of bushed grassland; probably competes with Rattling Cisticola in part, but occurs in degraded bushed woodland about GMF where that cisticola is absent. Forages out of sight, sometimes obvious in mixed-species foraging flocks. Less prone to call at human intruders than are cisticolas. Flycatches for winged termites. Drinks sporadically at bird baths (GMF), and rarely bathes. One fed for more than 20 min at the heads of fruiting leshwa bushes, whether for insects or seeds is unknown. Occasional calls indicate that it is resident, indeed it was at every site and many places in-between. It is well-distributed on the Laikipia Plateau (Olson *et al.*, undated MS, Lewis & Pomeroy 1989, Schulz & Powys 1998).

Behavior. Well-described (e.g., by van Someren 1956, Liversidge 1991, Maclean 1993, Urban *et al.* 1997), this cock-tailed little warbler displays using the tail (twitching it up/down and side-to-side, fanned or not) and flicking its wings. Chases occur, perhaps when two family groups meet, as well as in M-M pre-breeding conflicts. We have seen several *Vidua macroura*-like flight displays, the M flying at low (8 m) height, dipping up and down in a “dancing” flight, wings beating heavily, the bobbings very close together; the M then came down and sang from a perch.

Voice. Well known (Maclean 1993, Urban *et al.* 1997). Varied calls, sometimes double “tsi-ik,” “pseep-zeep,” “chok-chok”; may resemble double notes of African Paradise Monarch. Also gives single “chok,” “zheeeet,” and other tit-like notes. One called in hand: “tik-tik-tik” and a faster “zik-ikikik.” The somewhat variable song was well-described by Urban *et al.* (1997). Songs heard in all months, but there is an increase in number and length of singing bouts in April, and the period May–July marks peak of singing; there is a minor peak December–February, and in some years a September increase, all of these following one of the three rainy seasons.

Breeding. Although most nests found were abandoned, one active nest in June, dependent fledglings seen June–September, and independent juveniles July–September, plus preponderance of song (including duets) May–July, indicate the main breeding season in April–September, about as Brown & Britton (1980) gave for the region. An 11-cm-tall “purse” nest with the entrance at one side near the top (van Someren 1956, Urban *et al.* 1997, Tarboton 2001) was found at NG 7 June 1991; it was 65 cm above ground in a dense clump of grass with herbs around it, between two thickets, each 5 m away, and held three blue eggs with sparse fine reddish spots, not matching any of seven illustrated by Tarboton (2001: Plate 116). On 25 June adults were feeding three newly hatched young (nearly naked, with a few feathers, as we could gather at a distance). The parents fed industriously at 30–120 s intervals over 15 min.

Specimen data. Only two were netted, a non-breeding adult beginning molt of the tail, otherwise appearing not to be in molt, weighed 10.5 g and had a wing at 50.5 mm, taken at GMF 1 January 1997; and a sub-adult with some yellowy tips of breast feathers netted at MB 2 July 1990. The latter had a brown maxilla with yellowish base and tomia, and yellow mandible; the mouth was bright yellow; its eyes were umber brownish gray, differing from the red-brown eye of the adult (Urban *et al.* 1997). These represent the rather poorly defined race *P. s. melanorhyncha*. Molted adults were seen October–December.

Yellow-breasted Apalis *Apalis flavida*

Months. Common resident.

Ecology. Found in woodland, woodland edge, thickets, tall bushland and riverine woods, as well as gardens; frequented all sites. Forages at all heights, preferring small and large trees (*Acacia xanthophloea*, *A. abyssinica*, *A. gerrardii*), where perkily and carefully works over foliage, picking out insects. Occasionally hawks in-

sects from a perch. Joins mixed-species foraging flocks; feeds with white-eyes, drongos, tchagras, babblers, finches, and other warblers and three times followed foraging dwarf mongooses, taking insects flushed by them. Commonly found in mobbing groups of birds about snakes and Pearl-spotted Owlets, and seen alone mobbing Black-and-white Cuckoo, and also a glossy starling. Not seen drinking or bathing. No movements were observed in this apalis, widespread in central Kenya (Lewis & Pomeroy 1989).

Behavior. Well known (van Someren 1956, Liversidge 1991, Maclean 1993, Urban *et al.* 1997). Both snaps bill and audibly flicks wings during encounters. A M chasing a Common Camaroptera cocked and fanned its tail and noisily flicked its wings, snapping its bill occasionally.

Voice. Song familiar, in our area mainly, single-noted ("tik" to "tchlik" notes) and double-noted ("tok-it"), repetitive trills, always more melodic and less staccato than song of Common Camaroptera, as well as usually longer than the latter (Maclean 1993, Urban *et al.* 1997). The latter authors noted the often undulating tendency of the song. Duets (FF uttering "cheea-cheea-cheea" to "chuk-chuk" song, MM "tok-it" to "pyee-ip," song) are less frequent than in more moist uplands, and are common in January and April–August. Countersinging of MM, and use of both types of M song, are frequent throughout the year, but are most frequent May–June and to a lesser degree November–January. Songs generally are at a high level April–July, then diminish in August–September, to pick up again (in some years) December–January. At GMF song increased between late March–mid-May in diverse years, tailing off between July and October, with a slight December–January or February increase. In very wet 1997 song increased in April, peaked late July–September, during and after the less heavy July–August rains. We noted very early (before 06:25 h, earliest heard 06:00 h) and very late (after 18:35 h, latest recorded 19:00 h) songs only January and April–August at GMF, where we regularly monitored bird songs at 05:15 h prior to our departure, and 18:30–19:10 h. Calls have been characterized by the authors cited above. We heard "chip-buzz" calls from owl-mobbing apalises.

Breeding. Newly fledged juveniles were under care of their parents April–July and December, independent juveniles May–September and December–February, and nests have been observed May–July. Along with duetting, and singing parameters, these indicate peak breeding May–July and a smaller December–January

peak; both are later than described for the general region including our study area by Brown & Britton (1980), who had few if any records from our triple-rainy-season subregion. Four nests were 0.5–3 m high in bushes (*Euclea* sp.) and small trees (leleshwa). They were constructed of fine fibrils and twiglets with an outer layer of mosses and lichens, in a "purse" with a side entrance near the top (see van Someren 1956). Nests contained two or three eggs or young; the only eggs we glimpsed were very pale, essentially white (possibly very pale green, see Urban *et al.* 1997, but Chapin 1953 described a clutch of its eggs as pinkish white, see also Tarboton 2001), with fine to moderate purple-brown spots. Fledglings numbered two-three. Two young followed parents about on and near the ground, gulping tiny grasshopper nymphs.

Specimen data. We netted eight, one an immature; several could not be treated fully. Six adults weighed 8.4–10 g, and three had wings 49.5–51 mm (April, June, August and February birds were not molting, September and January adults were). The immature, yellow below with no breast mark, weighed 8 g, had wing 53 mm, and eye yellow-green. Adults all had a small to large breast mark, all of which splayed laterally toward the sides in a bar-spot. The mark often is crescentic (not the "smudge" mentioned by Stevenson & Fanshawe 2001), and was evident in most adults in the field. The ear coverts, under-eye area and lores were darker gray than the forecrown-forehead. They agree generally with *A. f. pugnax* (Urban *et al.* 1997). Our apalises had a buffy to dull orange-buff ring of feathers around the eye. The bill varied from almost all black to black with horn to whitish about the tomia, as in Chapin (1953) and Urban *et al.* (1997). The orbital skin is deep red to brown-red in a narrow ring around the similarly colored eyelids. The iris varies from hazel to yellow-gold with the very outermost portion grading through orange to deep orange, except for the immature noted above. We have seen no Yellow-breasted Apalis with brown or red-brown eyes (*contra* Zimmerman *et al.* 1996).

Common Camaroptera (Bleating Warbler) *Camaroptera brachyura*

Months. Common resident in all wooded and bushed locations.

Ecology. This often-confiding warbler forages near and on the ground amid or close by bushy and herbal cover. Individuals work certain routes methodically several times a day in seeking food, usually of insects, including ants. It was common at all sites in woodland, bushland, bushy thickets in *Combretum* grass-

land, gardens, thorny boma walls, tangles of debris about dams, and GMF camp in bushes about buildings and tents. It foraged on walls and in the roofs (of thatch) over tents, and also regularly worked through beeswax in our shed, exposing insects beneath the wax, and eating them. One threw itself against a screen-mesh window trying to catch a moth on its inside. It proceeds in great bounds, or creeps mouse-like, investigating crannies. This camaroptera is at the forefront of species mobbing actual or potential predators. We have seen it mobbing boomslangs, black mambas and puff adders on numbers of occasions, as well as mobbing Pearl-spotted Owlets, hornbills, and starlings. Not seen to bathe or drink, despite regularly foraging in its careful manner under and around camp bird baths. Sometimes joins mixed-species foraging flocks of terrestrial and near-terrestrial foragers such as finches, babblers, tits, other warblers, thrushes, and bush-shrikes. This is a widespread and familiar bird in Kenya (Lewis & Pomeroy 1989).

Movements. Resident, but disperses; one banded 24 November 1984 at MK was retrapped nearly five years later 27 July 1989 at UL, over 5 km in a straight line from MK.

Behavior. Well known (van Someren 1956, Maclean 1993, Steyn 1996, Urban *et al.* 1997). In courtship M sings, cocks tail and bounces over F, who may quiver her wings and solicit before him. Flips wings noisily, snaps bill at conspecific intruders, also at species such as Lesser Honeyguide, Yellow-breasted Apalis, and in driving away a singing M Red-faced Sylvieta. Very aggressive in vicinity of nest, and pugnacious generally.

Voice. Well known (references under Behavior above). Nasal "nyeah" call a familiar sound all year. Other calls include a harsh "skreek-skreek" series, "sweet" notes, a song-like "chip-chip" from an adult in hand, and "tchew-tchew" calls from nestlings (see Urban *et al.* 1997 for other calls). Song a mechanical, hard series of "chip" notes, shorter, less mellow and less wavering than that of Yellow-breasted Apalis; varies to "chrip-chrip" and to double-noted "cheep, cheep." F may give nasal notes nearly in time to the M's song. The song is much less often heard October–March than in other warblers, and other songbirds. Generally songs commence late April or May, peak late May–July, then drop off August–September. Extended songs, songs accompanied by displays, and very early and late singing follow the same trend as singing generally, except that they peak in May, with rates in April, and June–September being half or less than in May, and there is a near disappearance of these

in October–March. Songs May–June have been heard as early as 05:59 h and as late as 18:58 h; by July they are somewhat later mornings, and cease *c.* 18:30 h (calls occur before songs in the morning and after songs in the evening and even at 19:00 h or more in other months). Songs are usually uttered from cover, but one M at MK sometimes flew to the top of a large *Acacia xanthophloea* at 22–25 m, and sang there. However, it reached that perch from a small, steep hill close to it, and the camaroptera had to rise but 5–6 m to attain that perch. As noted above audible displays include wing flicking and bill snapping.

Breeding. Although recently fledged young have been seen as early as April (April–August), all eight active nests were in June–July, displays and soliciting were more frequent April–May, and dependent fledglings common only June–August. Also, July–August camaropteras were often noted as molting, and independent juveniles seen only June–September (subadults to February, one in April). Data from songs provided above clearly indicate an April–September breeding season with the peak in May–July. Thus, tends to breed late in big rains and through the lesser but more regularly occurring July–August rains. Brown & Britton (1980) suggested breeding April–June and October–December for the region generally, but few if any of their data were from the drier Laikipia subregion with its three rainy seasons. We avoided contact with nests, so we examined no eggs. Nests were from essentially on the ground to 3.4 m up, and contained two or three nestlings. Nests were well described by Steyn (1996), Urban *et al.* (1997) and Tarboton (2001), as well as by van Someren earlier (1956), and the tailorbird-like leaf-stitching of this camaroptera is familiar. Unusual in the nests we examined was the frequent use of leleshwa fluffy, white, cotton-wool-like fruit coverings in the nest lining. Most nests were tied to bases of small bushes or herbs such as the composite *Psiadia punctulata*. The 3.4-m nest was in a leleshwa and was unusual in that the actual nest was a cup-nest, not a ball with a side entrance near the top (Urban *et al.* 1997). Leaves were attached by spider webbing at the sides, and from twigs to the sides and above were loosely attached by several spider webs through pierced leaves to the nest, shading it, with spaces between them effectively providing four or five entrances into the cup. The nest itself was 70 x 52 mm and 110 mm from the top-most attached leaf to the bottom of the nest. A partly covered nest 12–13 cm up a many-stemmed tiny bush was found in our car-parking spot at MB 5 June 1989; we glimpsed two

eggs and a hatchling bird. The second egg hatched by 7 June, and the third by 8 June. On 18 June three young were near fledging. Fledging occurred abruptly on our arrival 21 June, giving 14, 15 and 16 days as the likely age of the fledglings. Fledglings accompany their parents for a considerable period.

Specimen data. We handled perhaps three dozen individuals, but some netted when we were overburdened with honeyguides were released. These unfortunately included a pair in breeding condition (cloacal protuberance in M, brood patch in F) 8 June 1996 in the lugga at UL, several juveniles that we thought might be harmed (netted May–July) and four adults that were weighed, checked for molt (none), and released by S. Sassoon 14 February 1985 at Center garden. Nine adults sexed as MM by a large cloacal protuberance on each were netted 12 April–1 July. These weighed 11–14.15 g (12.4 g) and had wings 50–58.5 mm (54.1 mm). Thirteen adults from all months weighed 11–13 g (12.2 g) and had wings 48–59 mm (52.7 mm). Three pink-gaped subadults (February, April, November) weighed 10.75–12.5 g. Weights match those of Schifter & Cunningham-van Someren (1998) from Nandi Forest, probably of the same race. One M netted 12 May showed an asymmetrical wing molt (all primaries fresh on left, numbers 1–6 fresh, 7 in pin and 8–10 old on right). The rusty to cinnamon thighs of this gray-backed camaroptera stand out against the grayish to white belly, not well shown in most illustrations we have seen. Reported to us by S. Sassoon and C. Francombe as first seen January 1980, and observed until May 1981 was an essentially albinistic Common Camaroptera, (all white, yellow edges of wing flight feathers, a pink bill, eyes and legs). A final plumage feature is the presence of a narrow orbital ring of feathers, varying in color from cream to buff, pale orange, cinnamon, and orange-brown (in two the feathers were buff over the eye and cream under it). Soft parts: The bill is black, at times with a horn tip. The mouth lining is gray-black or black in adults, pinkish in immatures and subadults. Eye colors were hazel, buff-cinnamon, to orange or hazel-brown (most were buff-cinnamon and hazel-brown); two had brown outer and buff inner rings of the iris. Subadult brown eyes lacked hazel or orange tones. Legs and feet were pinkish gray to pink-purple. Because only two individuals were dark gray over the underparts (the main feature of *C. b. aschani*, see Urban *et al.* 1997), we regard our more medium- to pale-gray (even dull olive-gray) ventrally colored

birds as *C. b. griseigula*; the wings are shorter in our camaropteras than measurements given by Urban *et al.* (1997).

Yellow-bellied Eremomela *Eremomela icteropygialis*
Months. All but months with our fewest visits, March and October; local resident, may wander.

Ecology. Prior to 1991 observed only occasionally about NP (Fig. 7), and at Kuti, in degraded, pastured *Acacia abyssinica* woodland/bushland, but since then more commonly SW to the base of GMF hill at Posho Corner, along GMF-Center road and Kuti-Center road, at or near Center, and to MK-LA, where observed in *Acacia xanthophloea* canopy. It feeds at all levels, almost entirely in acacias (some of which, especially *Acacia gerrardii*, have been bashed by elephants into no more than bushes). Seen near the N border of the study area 13 July 1994, and feeding in one after another of a line of planted acacias no higher than 2.5 m in the very open area S of Center 20 July 1994. Works in foliage much like an apalis, picking and probing at bases of leaves and thorns. Forages alone or loosely in pairs. None of its sites is above the 1900 m, limit given by Lewis & Pomeroy (1989). Occurs throughout the Laikipia Plateau at or below this elevation (Hartley 1986, Olson *et al.*, undated MS, Schulz & Powys 1998), and was noted in the study area 4 September 1968 by Sassoon, A. and J. Start, and Horne. Its movements and dispersal are not well known, but apparently is moving into open bushland and woodland of the N and W of the study area.

Behavior. Rather well known (van Someren 1956, Urban *et al.* 1997).

Voice. Song “see-wee-swee-swee-swee-see,” heard May–August only, though noted by Urban *et al.* (1997) as singing all year. We heard no mimicry in its songs. Territories seemed large; nowhere did we hear two singers or countersinging.

Breeding. No information, but presumably breeds during the May–August period in which it was heard singing. Brown & Britton (1980) had only February–April records, just four in number, for the entire region.

Specimen data. Examined closely in the field – it allows very close approach and we photographed one that escaped before we could measure and examine it (27 September 1987). The race occurring is *E. i. abdominalis*, well illustrated by Urban *et al.* (1997), except that the eye line (blackish gray) is broader, contrasting with the paler gray above it, hinting at the white superciliary stripe of some races, and the gray

across the breast is darker almost forming a band between the white throat and bright yellow of the lower breast. Zimmerman's rendering (Zimmerman *et al.* 1996) of this race is too pale above, lacks grayish that occurs under the eye, and lacks the gray breast patch that features this race (Urban *et al.* 1997), as well as overemphasizing the pale superciliary line.

Red-faced Sylviecta/Crombec *Sylviecta whytii*

Months. Common resident of woodland and bushland.

Note on English vernacular name. We favor "sylvietta" as the group name for these birds, also called "stumpy-tails" (van Someren 1956) in East Africa. Only one of the nine species reaches South Africa, where Afrikaans' "crombec" (bent or twisted beak, unclear why) may be used, but there is no reason for all others to be called by an Afrikaans' name. With much use of generic names as English names in this family (eremomelas, prinias, cisticolas), sylvietta is one of the nicer appellations, meaning "woodland sprite" or "little sylvia," and it is helpful for diverse Africans to have a useful group name.

Ecology. These tiny, short-tailed mites work their way over branches, twigs and foliage, pecking here, probing there, and pausing occasionally to utter a pleasant rollicking song. Forages singly or in pairs, the paired birds sometimes far apart, but maintaining contact by means of the sexually distinct songs (see Voice). Territories very large, and sylviettas may reappear in any part of it only every two to four days. Favors acacias for foraging, in long-spined species often utilizing spines as feeding perches. Found in open, often degraded woodland, edges of dense woods, and bushland. Can appear very like a nuthatch *Sitta* spp., criss-crossing its way up a vertical branch. Occasionally taps audibly in its insect-foraging. Moves rapidly, not spending much time working over a tree, but forages on one branch and maybe another, then moves to another tree. Very like camaroptera when feeding. Bashes large grubs and caterpillars before eating them. Frequently joins mixed-species foraging flocks with tits, bulbuls, other warblers, white-eyes and cuckoo-shrikes. Occasionally follows a Fiscal Shrike or Tropical Boubou as it moves about. Hawks for insects flushed by shrikes, and for emerging termites. Red-faced Sylviettas are important mobbing birds, often to be found around mobbers of, say owlets; we noted the dangers of mobbing in the related Northern Sylvietta *S. brachyura* when one was taken by a black mamba it was mobbing (Short & Horne 1987). Often roosts alone on a branch to which it returns, if not nightly, then very often, over a period of months,

forming itself into a non-birdlike, fluffy "ball" (Horne & Short 1986) in which it roosted c. 18:45–06:10 h. It occurs throughout the region (Lewis & Pomeroy 1989) at altitudes above those of the Northern Sylvietta, found to the N and E.

Movements. None, other than short-distance dispersal. *Behavior.* Rather well known (Urban *et al.* 1997). Interacts with Common Camaroptera at times; latter may supplant the sylviettas, even singing MM of latter.

Voice. Early in our studies we suspected that the two main songs were sexually specific (Horne & Short 1986). Further studies showed this to be the case. The M song varies geographically, but in the study area starts with a "chip," then a "witchy-wee, witchy-wee, witchy-wee, weee" or less often, "see-WEEEE, see-WEEEE, see-WEEEE, see-WEEEE" (near Nanyuki the latter song predominates). Rarely, perhaps when the F fails to respond, M may add two to three notes of the F song to end of its song. The F song is a "chee-wit-eee, shee-weeer, she-weeer, sh-weeer," louder and more warbled than that of the M. The M's song is four to five times more frequently heard than is that of the F, except during rare interactions between pairs, when half or more of the songs are of the F. We observed a nesting pair in GMF, the nest 1 m from our veranda, and heard only sexually appropriate songs. Indeed, when the M sang from afar the F would go from the nest to its top, sing a loud partial or full F song, the M would come closer, singing, the F flew to a bush nearby and sang again, then waited; within 90 s the M would enter the nest to incubate. Songs are heard all year, and the sexually discrete songs enable the mated pair to contact one another while feeding apart on their large territory. M song may be followed by a partial song by the F (detected as coming from different locations and pair can be monitored by following their songs). The peak of singing is in June (song heard 06:20–18:38 h, very rarely from 06:02 h, in May–June) with relatively high levels of song April–August (especially May–July), and a minor peak in December (the December level of song is exceeded only by May–June levels). The incidence of F song matches the levels of M song through the year. Songs may be given softly at times. We have released a F, who sang the F song on release, immediately eliciting a M song from its (banded) mate. A chip-trill that may be a song, was heard rarely, and once uttered at us, near a nest; the trill may be an alarm call. A fast series of "chuk" notes was heard from a sylvietta in hand, and it snaps the bill aggressively during encounters. Usual alarm call is an irregular series of sharp

chip notes. Other calls include a "tzzh, tzh, tzh," a "tya-wa-a" and a "ditto, ditto, ddeet-ddeet."

Breeding. The increase in song April–August (or May–September), with a smaller increase November–January suggests breeding during and following the three rainy seasons. While we have seen active nests only May–July, we have observed adults with begging, juvenal young April–September and November–December. At Nanyuki we have had a nest with hatching young in November, fledging in December. May–July specimens, and one M in February, showed a cloacal protuberance, and a May F had a full brood patch. Brown & Britton (1980) gave March–April and October–November as breeding periods for our area in general, but likely had no highland records from a triple rainy-season part of that region. Van Someren (1956) and Urban *et al.* (1997) described the nest. Six of nine nests we saw were in a dense-leaved *Euclea divinorum*, at 0.5–3.5 m above ground. Most nests were suspended about equally on all sides, i.e., they were deep, cup nests with the top relatively open, except for leafy cover above, the cup varying from 8 to 16 cm deep. A few nests were more "purse-like," closed above, with a lateral entrance. Nests were more variable than described by Tarboton (2001), and several matched those that he showed (Plate 109) for *S. rufescens*. Eggs seen in but one nest, in which the three eggs were white with lavender to brown spotting more or less all over the surface (as in egg 2 of Tarboton 2001: Plate 110). Young seen with parents numbered one to three, so two to three eggs seems to be the size of the clutch. After fledging the family moves away, for we did not see families in the vicinity of nests thereafter.

Specimen data. We netted 25 individuals; 16 unsexed adults, six in molt (in February, June, July), five were MM, one a F with brood patch and three were immatures. Weights for all 25 varied only between 10 and 12.5 g; the five MM averaged 11.4 g, the unsexed adults 10.87 g. The wings were at 55–61 mm (58.2 mm mean) in nine unsexed adults, and 56.5–63 mm (59.7 mm) in five MM. These seem large for *S. w. jacksoni* (see Urban *et al.* 1997), but they are generally bright below (Cinnamon to Cinnamon-Rufous in Smithe 1975), so represent that race. Two birds, a M banded 9 February 1985 and a F netted 7 May 1985 in MK were seen together, and with young, and retrapped (M nine times, F twice); the M was last handled 31 May 1992, and thus was at least eight years old, and the F was retrapped last 24 September 1997, 12 years and four months after banding, and

hence was at least 13 years old (both were banded as adults). Soft-part colors: The bill is rarely black, except on the culmen; more usually the maxilla is brown or dusky, paling to horn or pink-horn on the tomlia (and sometimes at its base), with the mandible pink-horn with a brown tip. There is a narrow orbital ring, buff-orange or pink-buff to rusty; the iris varies from hazel to buffy orange-cinnamon or cinnamon-brown (may be darker near pupil, paler outwardly), and is plain brown in immatures. The legs and feet are red-pink to pink-red.

Brown (Woodland) Warbler *Phylloscopus umbrovirens*
Months. September, December; three records, vagrant.
Notes. Distinctive brown warbler with greenish wing feather edges and rusty sides, known from just S of the study area (Lewis & Pomeroy 1989), observed in bushes at NG 14 September 1988, and 29 December 1993, and in the understorey of woodland at EG 31 December 1993. The last record was of one foraging with four Willow Warblers and two Chin-spot Batises; it was of the size of the Willow Warblers, but very differently colored, and well-known to Horne from the Kericho region of W Kenya. Although usually a resident bird, may be undergoing displacement as highland forests between NG and Nyahururu are being rapidly eliminated (especially remnants of Ol Arabel and Lariak forests and the formerly extensive Marmaret Forest of the E Rift).

Willow Warbler *Phylloscopus trochilus*

Months. September–April (once May); common boreal winter visitor and migrant.

Ecology. Occurs commonly during November–April, widespread in Kenya (Lewis & Pomeroy 1989). Early in our studies we used Williamson (1962), Moore (1983) and Svensson (1984) in identifying these warblers in the field and in hand, in addition to available "field" guides; later in the studies we came to use more recent works (listed in Discussion section). Willow Warblers forage diversely, in all habitats; we have even seen flocks in migration scattered about short grassland of airstrips (in usually wet April, especially when remains of emergent termites may be all about). It flycatches, hops on the ground, forages at shorelines of dams, joins mixed-species foraging flocks (particularly of mainly local flycatchers and warblers, also with migrant warblers), in open areas often with serins and cordon-bleus, and readily joins birds mobbing snakes and owlets.

Movements. Well known (Cramp *et al.* 1992, Urban *et al.* 1997). Seen once (12 September 1996) early in

September, otherwise 26 September–29 April, and once two at Center Dam 2 May (1996). Passes through Egypt mid-August onward, and to N until late May (Goodman & Meininger 1989); reaches southern Africa as early as early-mid-September, and half the boreal winter residents in southern Africa leave after early April (to late May, Harrison *et al.* 1997), hence should prove to reach Kenya as early as late August, and to tarry perhaps as late as early June. Occurs August–April in W Africa (Borrow & Demey 2001).

Behavior. Very well known (e.g., Cramp *et al.* 1992).

Voice. Also well known (Cramp *et al.* 1992). Calls in hand distinctly bi-syllabic, a “whee-eer” (recorded on tape). Heard singing in November (twice) and in April.

Specimen data. We handled nine individuals, all of which we checked for wing formula (all had primary 9 between primaries 5 and 6 in length, feathers numbered in ascending order outwardly), and color of feet (Svensson 1984, 1992; Harris *et al.* 1989, Jenni & Winkler 1994), which was gold-orange, orange-gold or bright yellow (especially underside of toes) in all. Weights ranged from 7 to 9.5 g (mean 7.96 g). Of eight measured for wing length, one, likely F, was 60 mm, and one measured 75 mm (wing chord; flattened wing 78 mm); the other six were 63.5–68.5 mm. Given the great variation in color and clinal variation (Cramp *et al.* 1992), we accept that the bulk of Willow Warblers in the study area are of the race *P. t. acredula* (Urban *et al.* 1997). Among the specimens handled we consider eight to have represented that subspecies. The very pale long-winged warbler netted at GMF 12 April 1995, with wing 75 mm and yellow visible in its plumage only in faint yellowy lines on its breast, was ascribed to *P. t. yakutensis* (Cramp *et al.* 1992, Urban *et al.* 1997). Many very yellow-plumaged first-year Willow Warblers were observed September–December, and the half-dozen or so seen at NG 12 September 1996 were mostly in this plumage. Soft-part colors were about as stated in the books cited above, including the pink to orange base of the mandible. The brightly colored feet were noted above. Leg color varied greatly (pale red-brown, pink, yellowish, yellow-brown, pale hazel brown, dark flesh-color, and pink-brown), but none had dark brown or blackish legs.

Wood Warbler *Phylloscopus sibilatrix*

Months. One December record, casual Palearctic migrant.

Notes. Seen clearly 5 December 1988 at PK, moving through the tops of low trees, this big, pale-billed warbler

was distinctly bright green above with unstreaked yellow and clear white underparts; its superciliary was yellow, the complete eye line blackish, and the face yellow with almost no hint of dusky in the ear coverts, obviously differing from both adult and first-year Willow Warblers. Though records from Kenya are few (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996, Urban *et al.* 1997), Stevenson & Fanshawe (2001) considered it reasonably common in W and scarce elsewhere; some “winter” in SE Kenya, perhaps where this individual was heading.

Brown Parisoma *Parisoma lugens*

Months. Local resident, disperses within study area.

Ecology. Common at NG, LU and SI sites, all having tall *Acacia abyssinica* trees; also seen several times in garden acacia at Center, and at Kuti Center, once at PO, and twice in *Acacia xanthophloea* trees at EG. Thus is in the S study area, in acacia woodland, primarily about streams. Observed foraging in *Acacia abyssinica*, *A. xanthophloea*, and *A. gerrardii*, but not resident where the latter two acacias are common. Forages tit-like, along branches and main upper trunk bark, in foliage and canopy of acacias, but also uses bushes and small trees, as *Rhus/Carissa* thickets at NG. Peers, gleans, probes, pecks and hangs upside down as it methodically works its way, often in pairs or family groups, through the canopy. Occasionally found in mixed-species foraging flocks of flycatchers, warblers and cuckooshrikes. Habits more nearly resemble those of an apalis or prinia than those of any of eight *Sylvia* warblers known to us (merged in *Sylvia* by Shirihai *et al.* 2001, but we await further clarifying studies). Found in upland woodland and forest edges in the region (Lewis & Pomeroy 1989).

Movements. Not known to undergo movements other than dispersal.

Behavior. Countersinging MM chase, raise crown feathers and supplant one another. Seen erecting crown feathers and calling at an aggressing Black Cuckooshrike. A nesting pair attacked and drove a Tropical Boubou from the acacia with a nest, and through three nearby trees until it left the area. M courtship feeds F.

Voice. Song heard in all months except March, peaks in May–July with a lesser peak November–January. Has an array of songs, song phrases, mostly with two-note phrases, as “tsee-too,” “too-tee” or “chee-pew,” e.g., “oo, chee-pew, chee-pew, chee” and “brrrrrrrrrr-tsee-too, tsee-too.” Often shifts from simple call “weet-wirr” to longer “tzer-yeet-yeet-wirr” and “rree-

too, ree-to, reet” and then going into the full song, which may start or end with a trill (thus, more complex than indicated by Zimmerman *et al.* 1996, Urban *et al.* 1997, and Stevenson & Fanshawe 2001). Another call is a “tsee-tsee” to a series “see-si-si-si” call uttered by a nest-building F that brings M to her (M may courtship feed F as she sits in nest, turning about to shape it). Still other calls are “chit-ip-ip-ip,” “peer” and “tit-it-it-tit.” Voice may vary racially; see Shirihai *et al.* (2001).

Breeding. Nests seen May and July (four nests), increased song May–July and slight increase November–January indicate a peak of breeding between the big rains and July–August rains, with occasional nesting perhaps December–January (after the little rains). Brown & Britton (1980) had four records for the region, likely none from a triple-rainy season area; their nests were April–May and December (during and following the usual two rainy seasons). One nest was barely seen at *c.* 15 m in upper branches (below the canopy) of an *Acacia abyssinica*; a warbler, presumably the F, was carrying fine fibers of bark and tendrils of vines to it 30 May 1992 at NG. Another nest under construction in an *Acacia abyssinica* at NG 17 May 1990 was 11 m up, and was a cup between two twiglets, well-shaded by several acacia leaves above. The F carried items to the nest, and after each was placed in the nest, she sat inside and molded its cup shape by turning round and round, both ways (she also called regularly, drawing the M to her three times, in each of which he courtship-fed her). Still another nest, similar in location at NG held two young 18 July 1993; adults fed the young unidentified insects, sometimes coming together to the nest, in which case one adult fed one youngster, and its mate fed the other, simultaneously. Another nest at NG 18 July 1993, situated at 1.5 m in a thicket bush beside a lugga, contained two whitish eggs with lavender-brown, modest-sized spots (reported to us by D. Chepus and S. Njagi). One adult was incubating at the time. We could not follow the progress of these nests, as NG was one of our less-visited sites. A pair at Sipili 13 July 1990 were moving about with a bob-tailed fledgling. Thus the clutch does appear to be two, and nests are suspended cups between twiglets.

Specimen data. Unfortunately we netted none. Frequently flits tail, showing white on the outer margins; tends to be darker brown about the eye than shown in Zimmerman *et al.* (1996), Urban *et al.* (1997), and Stevenson & Fanshawe (2002); see Shirihai *et al.* (2001: Plate 96-1).

Blackcap *Sylvia atricapilla*

Months. Late October–late April (none March); Palearctic boreal winter visitor.

Ecology. Mostly November–January (two records 22 and 30 October; one in February; seven in April, to 27 April), when common in bushy woodland edges and bushland where water is available; drinks frequently, one three times in 90 min. Readily came to ground to feed on papaya and mango peels at GMF; one F fed with two Common Bulbuls on these. Also feeds on *Carissa edulis* and *Euclea divinorum* fruits. Occasionally forages with flocks of Willow Warblers, and three times close to Garden Warblers.

Behavior. Very well known. One M at NG sang a muted song much of a morning, with occasional melodious phrases in it, as it foraged with a F seeming to follow it about (both foraged briefly in a bush with a Garden Warbler). See Cramp *et al.* (1992) and Shirihai *et al.* (2001) for behavior and voice. More common at our Nanyuki home where up to five MM may sing in March–April.

Specimen data. All 10 birds netted could not be treated fully. An adult M 30 October weighed 18 g and had wing 76 mm, and a molting 3 January M was 20.5 g with wing 74 mm (primaries 1–6 new, rectrices 1, 4, 5 coming in). Four FF November–February weighed 17.25–20 g (mean 18.4 g), and three had wings 72–76 mm (no molt of wings). Two November subadult (first year) MM with mixed brown-rufous and black crowns weighed 18 and 19.5 g, with wings respectively 73 and 72.5 mm. Two November–December subadult FF (rectrices sharply pointed, but see Jenni & Winkler 1994: 130–31) weighed 16 and 16 g, with wings 79.75 and 75 mm. We consider all (or most) of these, and additionally the many birds observed, as representing *S. a. dammholzi*, mainly because the crown of FF and immatures is duller, brown and less rusty than caps of birds of the nominate race in Europe, (Williamson 1968b, Cramp *et al.* 1992, Urban *et al.* 1997, Shirihai *et al.* 2001); MM also seem grayer and less brown above. The narrow suborbital ring is clear white, a feature not sufficiently emphasized in most works.

Garden Warbler *Sylvia borin*

Months. September–January, April; sometimes common Palearctic migrant, and local boreal winter visitor.

Ecology. Occurs in habitats similar to those used by commoner Blackcap, but perhaps more often in open areas with scattered bushes. Near NP 5 April 1993,

in roadside grass with bare patches and low bushes, two foraged in low bushes amid more than 100 Willow Warblers, throngs of Yellow-rumped Serins, lesser numbers of Red-checked Cordon-bleus, and a single Olivaceous Warbler; the Willow Warblers and finches foraged mainly on the ground. Drinks occasionally, not with the frequency of Blackcaps. Two joined a loose flock of Willow Warblers mobbing an African Little Sparrowhawk at EG 26 November 1994. Relatively quiet, occasionally flicks wings as it feeds. Occasionally forages near Blackcaps. For other ecology see Cramp *et al.* (1992), Baker (1997), Urban *et al.* (1997), and Shirihai *et al.* (2001).

Movements. Migrates through upland Kenya in numbers (Lewis & Pomeroy 1989), and “winters” in some numbers. Arrives as early as late September (our record, Zimmerman *et al.* 1996); main movement through Egypt southward is over in late September (Urban *et al.* 1997).

Behavior. Well known (Cramp *et al.* 1992, Shirihai *et al.* 2001).

Voice. Also well known; a “zhurr” note used in mobbing.

Specimen data. We netted seven, including an adult (evenly worn primaries and tail) at GMF 27 September 1998; others represent October, November, December, January, and April. Of these, the October warbler was a first-year individual (fresh plumage, including greater wing coverts, Jenni & Winkler 1994), and molt was evident only in the 3 January bird (inner 3 primaries new). The seven weighed 16.5–23.75 g (mean 19.8 g); wings of six (the worn January warbler in molt had wing 73 mm) were at 76–82 mm (mean 78.8 mm). These could represent large individuals of nominate *S. b. borin*, or more likely the weakly defined E race *S. b. woodwardi* (note that Urban *et al.* 1997: 384 gave wing length of E *S. b. borin* as 79–85 mm, greater than wing lengths of supposedly larger *woodwardi* at 77–84 mm). Generally these Garden Warblers were quite gray above, but virtually all showed some buff along the sides; we consider them as *woodwardi* and likely *woodwardi* × *borin* racially. All were checked for aspects of wing formula (Williamson 1968b, Cramp *et al.* 1992, and later also Shirihai *et al.* 2001) of the Garden Warbler. We noted especially its lack of pattern, short bill, often conspicuous pale gray rear of the ear coverts and rather stolid demeanor. In the hand we observed that the narrow whitish ring of orbital feathers is broken front and rear by the dark thin eye-line. Two individuals, one

20 December 1988 at MB and that of 3 January 1990 at GMF, were netted the same day and at the same place as two Blackcaps.

Common Whitethroat *Sylvia communis*

Months. December, April; four records, casual Palearctic boreal winter visitor.

Notes. This Palearctic warbler usually visits lower elevations (to 1200 m, Lewis & Pomeroy 1989), but passage is close to the study area in the W, where occurring at lakes Baringo and Bogoria (Hartley 1986). Stevenson & Fanshawe (2001) gave 3000 m as its upper limit. Two MM seen, 18 December 1994 in bushes at NG, and 6 April 1994 in bushes at TA; and one F in thicket in open bushland at base of GMF hill 27 December 1993. The MM seen were quite gray on upper back and crown, and the wings of these MM and the F were notably less rusty than those of Whitethroats familiar to us in W Europe, thus fitting within the range of features of the apparently commonest race in Kenya, *S. c. icterops*. The fresh-plumaged M netted at GMF 25 April 1994 (thus, three of four records were in 1993–94, on the heels of very dry 1993) had mixed features: its crown and hind-neck were distinctly brown-gray, unlike the two MM seen in the field, but the edges of the wings were buffy, not rust-brown. Its weight 19.25 g is rather great, although fitting in those of unsexed, racially possibly mixed April Kenyan Whitethroats (12.1–22.3 g) given by Cramp *et al.* (1992:477) and Shirihai *et al.* (2001). The short wing (70 mm) perhaps suggests that it may have represented an intergrade of *S. c. icterops* × *S. c. communis*, but racial variation is complex and rather slight in this warbler (Cramp *et al.* 1992). The eye of the M was yellow-brown, its legs pinkish brown, and the narrow orbital ring, broken front and rear, was buff-white.

Barred Warbler *Sylvia nisoria*

Months. One November record; rare Palearctic visitor.

Notes. A first-year Barred Warbler was observed in bushes on Center South Dam wall with several Garden Warblers, 16 November 1992, at 1860 m, somewhat higher than usual (Lewis & Pomeroy 1989 gave 89% of occurrence below 1500 m, found November–April W of the study area about lakes Baringo and Bogoria, Stevenson 1980 and Hartley 1986). The Barred Warbler rather closely resembled that shown by Harris *et al.* (1989), and since then better illustrated in Cramp *et al.* (1992), Harris *et al.* (1996) and Baker (1997), as well as Urban *et al.* (1997), and, with photos as well, in Shirihai *et al.* (2001).

With Garden Warblers well in view for comparison, it was easy to appreciate the larger size and obvious patterning (pale edges of wing coverts and inner secondaries, pale scalloping on some uppertail coverts, and white outer tail feather tips), as well as paler, sandier overall color. The corner tipping of the Barred Warbler's tail made its longer tail seem more pointed, not square as is that of the Garden Warbler. Nonetheless, at long range and without Garden Warbler for comparison, poorly marked Barred Warblers in this plumage could pass for Garden Warblers at a distance.

MUSCICAPIDAE Flycatchers

Pallid/Pale Flycatcher *Bradornis pallidus*

Months. Resident; usually common, some may leave area in extended dry periods.

Ecology. Common, lanky flycatcher of woodland edges, wooded grassland, open, degraded woodland-bushland and about gardens, more than half the time seen in pairs. Favors bushy areas and areas with low trees having some bare ground, hawks insects on the ground from perches (including fences) above. Aggressive, often attacked by, and returns attacks of African Drongos especially, but also cuckooshrikes, orioles, bulbuls and other birds. Often forages near other active, usually terrestrial birds such as a guinea-fowl, lapwings, and small passerines, dropping from a bush or fence down to insects disturbed by those birds. Sometimes perches near other flycatchers, with which it may interact, including much less common African Gray Flycatcher (the only one of which netted was taken in net with three Pallid Flycatchers). It overlaps completely with that gray flycatcher in the study area, including extensively bare areas as Posho Corner; although its congener usually occurs in drier, more open end of the spectrum of habitats frequented by the Pallid Flycatcher, even there it is outnumbered by the Pallid. Drinks and bathes at times. Forages at edges of, and into recently burned bushland. Eats black ants picked from the ground, often hops about (infrequently walks), foraging on the ground. Several pairs may gather at local emergences of termites. Participates in mixed-species foraging flocks, especially of diverse flycatching species as well as loosely with ground-feeding finches, larks, wheatears and others. Forages beneath frugivorous birds active in fruiting trees such as figs, taking insects flushed by movements of the birds. Also present in mobbing groups at times. *Movements.* Apparently none, monthly occurrences equate with the amount of time we spent in the study area. Generally considered resident.

Behavior. Wing flicks conspicuously, at times raising one partly spread wing at a time over its body, when in pairs, by calling or singing individual (M?); occasionally both birds display. Also erects crown feathers at times when calling, possibly important interspecifically in interactions with its more streak-crowned congener the African Gray Flycatcher (we have not seen such interactions). Unfortunately even pairs are inconspicuous, hence often missed or seen perched, doing "nothing."

Voice. Various described (Maclean 1993, Zimmerman *et al.* 1996, Urban *et al.* 1997), not loud but insistent combination of harsh notes, twittering and warbled notes, often with an up/down rhythm, or double notes among them. Sometimes short, three or four notes, as "chir-tee-milk;" once continued for over 15 min as a dawn song from 05:51 h, usually from a bush or small tree but sometimes from the top of an olive tree or large acacia (both birds, presumably the pair, perched together). Calls sometimes a "t-see" or "tsee-tsee," and a harsh "churr;" also a fast "brddddd" (or "brrrrrrp"), once at a bulbul. We have heard no petronia-like calls (see Stevenson & Fanshawe 2001). It often sings in windy situations, and the songs or calls may not be heard. It is more noisy than allowed ("rarely heard") by Stevenson & Fanshawe (2001). Harsher notes are more evident when three to five Pallid Flycatchers interact than when M is singing near F. Indeed much communication carried out in its singing and calling must be of a short-distance nature, functioning in pair relations and interactions. Songs heard in all months except February, and slightly more often May–August than in other parts of the year.

Breeding. Although nests are often conspicuous, very few were found. However, begging dependent fledglings in the distinctive juvenal plumage were noted mainly June–August, with an April and a November record. Lone immatures dated April–September and November–December, with two subadults in February. Allowing for the fact that Brown & Britton (1980) had few if any regional records from a triple-rainy season section of their region D, we concur with their conclusion that Pallid Flycatchers breed mainly in the rainy season (Urban *et al.* 1992 gave breeding in this region as October–May, but 15 of our 21 records of dependent juveniles are from June–August). Thus breeds mainly following the big rains and into the July–August rains, with some breeding at times during the big rains, and following the little rains. We saw no eggs; we never observed more than two (usu-

ally but one) fledglings with adults, so the clutch is usually but two in our area. One nest was 2 m up a small *Rhus* sp. bush, constructed of rootlets, fibers and fine stems of herbs. Being built at MB 28 April, the F constructing it carried an entire root system of a large herb to the nest and (conspicuously) pulled bits of fine rootlets from it held draped over a branchlet near the nest, which she continually molded and shaped as she worked on it (it was later abandoned). A pair constructed a nest 2.5 m up in a 3.4 m *Euclea divinorum* at CS 8 July. In addition to fine fibrous materials taken to it, one adult carried a piece of bark having two long thorns from an *Acacia gerrardii* to the nest, and worked it into the wall of the nest, thorns pointing outward. Other nests were noted in construction (for other details see Tarboton 2001: 203), but we did not disturb them because of the open surroundings and lack of cover for us. Parents of fledglings are aggressive; when we netted one recent fledgling the two adults attacked us, actually hitting us with their bills – we quickly released it.

Specimen data. We captured 32 Pallid Flycatchers; one was a juvenile we let go right away, one was an older immature netted 18 November 1985 and recaptured 13.5 months later, and a third was an adult taken 18 November 1985 and recaptured 16 months later. In addition to the released juvenile, five others were immatures (including one later recaptured as an adult), and 26 of the flycatchers were adults. The two birds recaptured later weighed the same (immature 26.5 g, later as an adult, also 26.5 g) or nearly the same (adult at 28.5 g when renetted 16 months later weighed 28.75 g) both times they were netted. Three immatures were netted alone, the juvenile netted and released had its parents nearby, and 19 other adults and immatures were taken with one or more other Pallid Flycatchers in the same net, suggestive of the tendency of this flycatcher to occur in pairs or groups. We sexed seven MM and three FF by cloacal protuberance and brood patch occurrences. Generally unsexed adults ($n = 17$) weighed 23.5–29 g (mean 26.7 g), seven MM were 22–28.5 g (26.4 g), and three FF 25–27.5 g. Five immatures weighed 23.5–26.5 g (24.7 g). Ten unsexed adults had wings 91–104 mm (99.4 mm), five measurable MM were 99–103 mm (101.2 mm), and the three FF were shorter-winged at 94–96.5 mm. Thus, immatures are lighter than adults, MM are longer-winged than FF, and MM may be slightly heavier than FF. These exceed weights and wing length given by Urban *et al.* (1992) for *B. pallidus murinus*, the largest race, of the Kenyan central

highlands and westward (see also Traylor 1970, and Zimmerman *et al.* 1996). There is a narrow white ring of orbital feathers, connecting above with a narrow white anterior superciliary line. Soft-part colors: Mainly as stated in Urban *et al.* (1992). However the bill often is all-black, with little or no paling at the base of the mandible. The mouth is black, in breeders quite shiny black; fledglings have a lemon yellow lining of the mouth and yellow gape wattles that soon become black, which is the color in (older) immatures.

We were forced to make careful comparisons in order to identify the Pallid and African Gray flycatchers that we saw. Generally the Pallid has a longer bill, is longer-tailed, and slimmer, as well as grayer, often appearing pearly gray to sandy gray; it is whiter below and has sandy tan, not brown below. The shorter-billed African Gray, with its shorter tail is more plump, and gray-brown, browner above and below than the Pallid. We were surprised to find that the Pallid actually has fine black shaft streaks on its crown (Fig. 19); they show weakly, or not at all against the gray of the vanes, except that forehead streaks often show against the gray background. The pale gray-brown crown of the African Gray is browner, and has longer, broader dark streaks that are arrow-like and thus show more clearly than in the Pallid. The slim shape, grayer coloring, virtual lack of wing markings, very weakly marked top of the head, less contrastingly white throat, and tendency to occur in pairs (over 50% of the time, versus *c.* 15% of the time in the African Gray Flycatcher) allowed us to identify all well-observed Pallid Flycatchers.

African Gray Flycatcher *Bradornis microrhynchus*

Months. All but March; uncommon local resident.

Ecology. Occurs mainly in N of the area, in low numbers, although seen several times in the S (near NG, N of Main Gate, near LU); favors drier areas than Pallid Flycatcher (has much broader distribution in dry Somalia, Ash & Miskell 1998), mainly the degraded acacia open bushland from NP to Kuti and W to Posho Corner, and open areas of the Lugga Maji Nyoka, PK and TA. Often in old bomas and bare open lugga beds. Sometimes forages in mixed-species flocks with other flycatchers, and several times with Pallid Flycatchers, which see above for distinguishing features. Its insect foods are well-covered by van Someren (1956) and Urban *et al.* (1997).

Movements. Must wander in addition to dispersing, as it is casually seen in well-visited sites (the dry S lugga at EG, CS twice, Center three times), and does not stay to breed where sighted in the S part of the area.



FIG. 19. Heads and bills of sympatric Pallid and African Gray (right) flycatchers netted 3 July 1992 at FS site. Note the very fine streaks in the crown of the Pallid compared with the broader dark streaks in the crown of the African Gray; the Pallid has a longer bill (the Pallid also is grayer, less brown on the crown). Both have a pale orbital ring and an anterior superciliary line, these being more buffy in the African Gray than in the Pallid (see text).

It occurs less frequently in highlands than the Pallid (Lewis & Pomeroy 1989), found to our W (Hartley 1986); reaches 2000 m (Stevenson & Fanshawe 2001).

Behavior. Flicks wings less often and more weakly (van Someren 1956) than Pallid Flycatcher. Drops to ground for insects, but less frequently moves about foraging on ground.

Voice. As noted by van Someren (1956) is generally silent, much less vocal than is Pallid. Songs heard infrequently June–September, and in few places (NP, ML), and only at NP have we ever seen more than one pair. Has weak voice, a “zheee-zheee-zheee-r’sip-r’sip,” sometimes with more warbled, melodious notes.

Breeding. Known to breed in the rainy seasons, and have several broods in a year in more favorable situations (perhaps lacking Pallid Flycatchers, van Someren 1956), but we have evidence of breeding only in

July (adults carrying food into dense *Acacia gerrardii* at NP), two adults with a dependent, spotted juvenile 24 August 1987 at NP, and another pair with a similar young in tow on the barren (degraded bushland) slope S MB 29 August 1987. These suggest breeding late in the big rains and especially in the July–August rains. Most of Brown & Britton’s (1980) records for parts of our region with but two rainy seasons were in April–June, August, and especially in December.

Specimen data. Only one netted, in nets with three Pallid Flycatchers 3 July 1992 at FS (degraded woodland about an abandoned boma). It weighed 21.75 g, just below the lowest weight we had for 32 Pallid Flycatchers. It was in molt, at about the same early stage as were two of the three Pallid Flycatchers with it; primaries 1 and 2 were new, the rectrices new except missing number 1 – its worn wing was 80 mm, well below that of any Pallid we handled. Like the

Pallid it had a fully black mouth, but its shorter bill, much more pale-edged wings, and more conspicuously streaked crown were obvious (Fig. 19). It had a very buffy face and quite marked buff-white superciliary line. Apparently represents the race *B. m. neu-manni* (Urban *et al.* 1997).

Silverbird *Empidonax semipartitus*

Months. Two records; casual visitor, August, December.

Notes. A bright M sang several times 17 August 1986 in our old camp. It was at the edge of the croton-acacia "island" surrounded by bushland at *c.* 1800 m. The simple warbled song lacked harsh notes of *Bradornis* spp. songs. It did not reappear. One other M foraged (near a group of mainly Willow Warblers) at EG 25 December 1989. It occurs mainly at 1000–1500 m (Lewis & Pomeroy 1989, Urban *et al.* 1997), although Stevenson & Fanshawe 2001 put its upper limit at 2300 m, and likely wandered upwards along the Mukutan to EG and our camp from Lake Baringo, where resident (Stevenson 1980; also at Lake Bogoria, Hartley 1986). It is listed (with African Gray, but not Pallid flycatchers) at Mutara, as resident in riverine woods by Olson *et al.* (undated MS), the lowest elevation at which is 1850 m.

Southern Black Flycatcher *Melaenornis pammelaina*

Months. All but February–March; local but not regularly breeding resident.

Ecology. *C.* 45 records, likely mistaken occasionally for distant drongos. Half the records are from MK-LA-EG, multiple records otherwise only at MB and Kuti garden, and once each at GMF, the road to OD, UL, LU, and original camp (between GMF and Olari Nyiro Spring). Favors open areas about bushes and tall trees, thus at woodland edges, also attracted to recently burned bushland and woodland (perhaps attracted to areas burned in the late 1980s, as all but two records are from 1989 onward). Tends to forage by hawking in the interior of large trees, especially *Acacia xanthophloea*, as well as low in and below bushes to the ground. Also frequents tall trees at open gardens, as at Kuti. Removes wings from dragonflies it has caught, before eating the insects. Sometimes occurs near African Drongos, but also avoids them, as harassed by them (plumage and shape reputed to be in mimicry of the aggressive drongo, Maclean 1993). Occurs to 1940 m; Lewis & Pomeroy (1989) gave the upper limit as 1800 m, but it occurs in all their "quarter squares" over the entire plateau, and is

known from Pinguone (Schulz & Powys 1998). It is absent W of the Plateau, at Baringo, and Bogoria.

Movements. Present from 1989 onward yearly at EG, otherwise irregularly occurring, perhaps due to poor breeding and limited dispersal at the upper edge of its altitudinal range. Even those at Kuti may be wanderers and dispersing individuals.

Behavior. Usually quiet and inconspicuous. Interacts with drongos at times when they nest, chased by drongos. At nest M drove a Crowned Hornbill away, from tree to tree. During chases wings make fluttery sound and flash white on the underside (Maclean 1993). Tail flips up-down when interacting.

Voice. Generally silent. Song heard only May–July at EG, MB, and MK. Known to imitate voices of other birds, including drongo (Maclean 1993), but no evidence of that here, where song mainly of repetitive, three-note phrases, a "pseet-pseet-sit," or "see-see-sit," and occasionally four-note phrases ("psee-ee-ee-ee" and "psee-see-see-eeet") with little warbling (see Maclean 1993, Urban *et al.* 1997). Various calls not listed by those authors: commonly a "tsee-seet," a soft "pit" contact call between paired birds; a "wheep" call; a "psee-pseeeee" (that may go on into song); in the hand a "skreeeah;" and from fledglings a "chee-chee" to "tsh-tsh." Also wing sounds heard during interactions.

Breeding. Known certainly only at MB (late May 1989, pair feeding two fledglings), at MB (13 July 1993, adult feeding begging young), and at EG (nest early May 1995). A somewhat worn immature netted at UL 18 October 1992 was probably produced in the study area. With songs May–July, and evidence just noted, breeds after the big rains into (perhaps through) the lesser but more regular July–August rains; the two records for the region by Brown & Britton (1980) were in March and November. The nest, of fine fibers and twiglets, was in the exposed end of a stub of a live olive tree at 13 m, at the edge of woods with a glade below 7 May 1995. The F sat in the cup, squirming to get in, sitting with tail up. The M brought twiglets to her, and also courtship-fed her as she sat. He also sang over her, drove away a passing Crowned Hornbill and a paradise monarch, but paid no attention to a White-eyed Slaty Flycatcher feeding above the nest. The nest was intact 9 May, when the F left it for 15 min of foraging low in bushes around the glade (M perched over the nest), but on 15 May the adults were gone and the nest hanging in strips down from the stub (perhaps the hornbill or other aerial predator was responsible?). Nests of this flycatcher may selectively be placed in cavities with

fire-blackened entrances (affording protective coloration, Steyn 1996; see also Tarboton 2001).

Specimen data. An adult netted near MK 11 July 1991 weighed 24.5 g and was already in full molt (primaries 1–7 new, tail and body molt), perhaps having bred in May. Brown-eyed, black-billed and black-legged, it had a pink mouth with black toward the bill edges. The immature obtained 18 October 1992 was fully black-mouthed, and its bill was patchy brown and horn-colored; it weighed 27.5 g and had the wing 99 mm. It was not molting and had brown flight feathers, was brownish about the face, and had buff spot-bars on the wing coverts and uppertail coverts. Otherwise it was quite glossy, blue-violet. The adult was more violet-glossed (race *M. p. tropicalis*, Urban *et al.* 1997). Molting adults were observed July–September.

White-eyed Slaty Flycatcher *Melaenornis fischeri*

Months. Local resident, wanders (and disperses) in riverine woods and other tall-tree woods.

Ecology. Usually associated with tall trees and forest edges, in riverine woods and open woodland, as well as trees about gardens; forages to ground however, so requires somewhat open areas beneath trees. Hawks insects from perch at any height, and drops down onto insects (sometimes lizards) on the ground. Present in low numbers about appropriate sites, and disperses or wanders into bushland habitats. Drinks from streams, dams, puddles, bird baths and garden lawn-sprinklers; also bathes frequently, may splash against wet leaves to bathe after rain. Eats some fruits, as *Carrissa* and *Euclea* berries, even feeds fruits to nestlings (van Someren 1956). Forages, sometimes in family groups, in mixed-species flocks, especially of flycatching birds (such as *Bradornis*, *Batis*, *Muscicapa*, *Terpsiphone*, *Dicrurus*, and *Prodotiscus*), and sometimes with warblers, weavers, tits, and others (to 17 spp. in one flock). Also joins other birds in mobbing predators, and chases Tropical Boubous from vicinity of nests. Movements only in dispersal and local wandering; numbers very low, few sites occupied (NG, LU, SI, EG, MK, OD) in very dry years.

Behavior. Chased, and chases other flycatchers at times, also cuckoos, starlings and various honeyguides. Flips tail in some displays, showing white of its undertail. May sing hunched, with wings held partly spread; sings to image in glass windows, attacks image, beating with its wings.

Voice. Song rather loud, resembling that of the Golden-breasted Bunting, with repeated two-note and three-note phrases (“wee-sew,” “wee-see-see”); examples are: “wee, chew-ee-see, chew-ee-see, see-wee-see,” “cha,

sa-wee-too, a-wee-too, a-wee,” “tsip, wee-see-see, wee-see-see, weeee-see-see-a,” and “weee-sew, wee-sew, wee-sew, aa.” Begging young call “tseep,” and alarm call is a “screet-screet” (van Someren 1956, Urban *et al.* 1997). Songs were heard rather infrequently (never heard by van Someren 1956), mainly in May–June.

Breeding. Occupied nests were observed May–July, as was nest-building. Dependent juveniles (recently fledged) were noted in all months except February–March, but the main peak (four or more per month) was May–August, and a lesser peak November–January. Likely second nestings account for September–October dependent young. Immatures, including subadults with few indications of juvenal markings, were seen April and June–January (peak August–November). Brown & Britton’s (1980) breeding records for the region were mainly from Tanzania and S Kenya with different rainfall. Some nests were in the tops of *Acacia abyssinica* trees and not well seen. One at MK 31 May was in a natural cleft between branches of the trunk of an *Acacia xanthophloea* at 6–7 m. Nests seem to be of mosses and rootlets as described by van Someren (1956) and Urban *et al.* (1997). The only copulation observed was briefly seen 18 December at NG. We never saw more than two fledged young.

Specimen data. We netted eight adults and seven “immatures” (recently fledged juveniles to subadults); newly fledged, bob-tailed young were released twice without examination. One juvenile was re-netted three times over three months (weights 25–28 g). Several others were taken again, mostly a short time later, but two were netted 14 months after initial banding and one adult was netted 19 months after the first capture. Eight adults weighed 24.5–30 g (mean 26.9 g); seven immatures were at 24.5–28 g (mean 25.9 mm). Only four adults could be measured, and were 87–91 mm in wing length (mean 89 mm). These fit well with weights of Nandi, W Kenya *M. f. fischeri* (Schifter & Cunningham-van Someren 1998), with which our birds seem to agree (see Urban *et al.* 1997), although they tended to be heavier and shorter-winged. Soft-part colors: Bill blue-gray to gray-horn with black tip, paler in immatures; just-fledged young have bill creamy horn with a black tip. The mouth is flesh pink in adults, green-yellow with orangish near the base of the tongue of immatures, which may show a yellow to green-yellow gape flange (one juvenile had yellowish flesh mouth). There is a narrow, slaty orbital ring of skin that sets off the much larger powdery white orbital ring of feathers in adults (one adult had

this white extending through the lores to the base of the maxilla); young birds have a smaller white ring. The eyes are dark brown, and legs and feet gray-black, with grayish white toe pads.

Spotted Flycatcher *Muscicapa striata*

Months. October–November, April; uncommon Palearctic migrant.

Notes. Can be locally common some years in April, less common late October and November. Found almost anywhere, in roadside bushes, on fence wires, and in woodland edges and bushland. Once on water faucet (dripping) at Center. Two called and chased 11 April 1994 at MK; one chased by African Gray Flycatcher at MB. Dates in April range to 26 April (1994, 1996); the last boreal wintering Spotted Flycatchers leave southern Africa in late April or occasionally early May (Harrison *et al.* 1997), and this species passes through Egypt into late May (Goodman & Meininger 1989), so may occur in Kenya into May. Our October records are of flycatchers netted 22 October at PK (where several were seen), and two at EG 28 October, all three in 1987. None were first-year birds, nor were they in molt; weights 12.75–15 g, wing 84.5–87 mm. The April bird taken at LA 12 April 1993 weighed 13.5 g and had wing 85.5 mm. They were generally brown-gray and pale below, only one having warmly buffy sides, so we regard them as representing *M. s. neumanni* (see Cramp *et al.* 1993, Urban *et al.* 1997), or in one case possibly *M. s. striata* × *M. s. neumanni*. The races are not strongly marked.

Dusky Flycatcher *Muscicapa adusta*

Months. Locally common woodland resident.

Ecology. Resident in six well-wooded sites (MK, EG, SI, KS, LU, and NG), it is a highland forest-edge and woodland flycatcher, hawking insects from high to low perches. Usually solitary, in pairs when breeding. Drinks occasionally. Takes and bashes dragonflies before eating them. One fed over eland killed by lions, snapping up flies. Participates in mixed-species foraging flocks, especially of other flycatchers, but also with helmetshrikes, cuckooshrikes, orioles, weavers, and warblers.

Movements. Locally disperses, visits several other wooded sites casually, as to TA and OD.

Behavior. The usual interactions with other flycatchers occasionally (less aggressive than most); also a pair vigorously chased two Greater Blue-eared Glossy Starling away from a nest site at SI.

Voice. Low, “seepy,” sibilant voice. Song a simple, high “see-ew, see-ew,” to a “tzeeeet, tzeeeeit-zeeep, zeeeeeit-

triiit-zeet-eet” (see also Maclean 1993, Urban *et al.* 1997). Call distinctive “tseeeeeee,” high-pitched and sometimes breaking into several parts, as a “tseee-eee-ee” in alarm at hawk. Songs heard May–August, October–January.

Breeding. Breeds May–August (rarely March–September), and to a lesser degree November–February. These months mark the times of singing and occurrence in pairs. Nests seen in June, fledglings with adults June–August (once April, October), immatures noted alone July–September and December, and courtship observed in January (M flipping wings, raising head high, singing in front of quivering-winged F). Nests were high in *Acacia abyssinica* trees; one at 12 m was in a dangling, rolled up, long strip of bark, barely attached to the tree – the nest failed. Usually but two young were fledged, but at LU 3 October 1986 the pair had four fledglings following them about. The spotted immatures are easy to identify given the uniform color of adults and the close approach allowed by these birds. Van Someren (1956), Brown & Britton (1980), Urban *et al.* (1997), and Schifter & Cunningham-van Someren (1998) have more breeding information.

Specimen data. Only one netted 2 August 1989 at MK; it weighed 9.5 g and was starting its post-breeding molt (primaries 1–2, tail, body). It represented *M. a. interposita*.

MONARCHIDAE Monarchs, monarch-flycatchers

African Paradise Monarch/-Flycatcher *Terpsiphone viridis*

Months. All; some migration, and numbers low in study area during droughts and dry periods.

Ecology. Can be abundant, especially since it is conspicuous and vocally distinctive, in wetter periods. Decreases radically in extended dry periods. Following dry 1990, only one seen anywhere in February 1991, but following wet 1997, including its little rains, immatures seen in January 1998, with nests in February of that year. Hence, no set migratory pattern, and it likely moves locally in the study area and surrounding regions. Over the years became common generally in April, staying to July (August or September in some years), then diminishing in September–October of most years. Lewis & Pomeroy (1989) indicated the occurrence of movements of highland birds. Occupies wooded and well-bushy habitats and gardens, especially near water (wanderers occur in degraded woodland-bushland at GMF during April–August, occasionally breeding, and using bird baths). Drinks

regularly and “drop-bathes,” flying at or dropping from the air with a splash, sometimes immersing itself, then flying to a nearby perch. They do not step or hop into the water to bathe (possibly “drop-bathing” is common to monarchine birds?). Forages by hawking for insects, in the canopy and down to the ground, usually from cover; also hovers occasionally, and may move actively, gleaning and snapping up insects (see Urban *et al.* 1997). Occasionally feeds with yellow baboons and dwarf mongooses, taking insects flushed by the mammals. Feeds at lion kills. Commonly joins mixed-species foraging flocks (of up to 17 species), including especially other flycatching birds (species of *Muscicapa*, *Bradornis*, *Batis*, *Melaeornis*, cuckooshrikes, helmetshrikes, drongos), and others such as orioles, tits, honeyguides, bush-shrikes, weavers, white-eyes, wood-hoopoes and warblers.

Movements. Some move out of the area for dry periods, virtually disappearing from all but the high SW corner (NG). They probably move singly or in pairs; groups of three-four moved through OD 12 May 1989, and we have seen larger-than-normal groups near dams that may have involved migrants.

Behavior. Often aggressive (usually so to non-family members, *contra* Urban *et al.* 1997; see van Someren 1956), hence a frequent mobber, with others, of owlets and small hawks, as well as snakes. Attacks African Little Sparrowhawks on its own, also Gray-headed Bush-shrikes (a nest predator of this monarch). One M attacked an immature eagle-owl and landed on its back momentarily; has also attacked us near its nests. We have seen fights between FF, once in the absence of a M; in one intense interaction one F went into a soliciting posture, with begging calls, to the other. MM sometimes use a tail-swinging display, holding the long central tail feathers up (tail cocked), then turning from side to side with F nearby. We also saw a M fly slowly, dipping its tail up and down as it sang and circled the nest area. Other aspects of behavior are treated in van Someren (1956), Liversidge (1991), Maclean (1993) and Urban *et al.* (1997).

Voice. Urban *et al.* (1997) provided a compendium of vocalizations, more or less matched in our study area. Contact call, often a first indication of its presence, a “zwee-zwer” (Liversidge 1991) to “zwee-weet,” loud and liquid; can be three-noted, a “pyee-eea-weet-weet.” Begging call is a repetitive series of “tsip” or “chip” notes. The song is variable, often contains some “weet,” “weee-oh,” and “twee” (or “see-tee”) notes. The song uttered by the flight-displaying M (see Behavior) was a “wink-wink-wink-wink-kwee.”

Other songs are more harsh or raspy, and may include trilled series. Most songs were heard April–July, with a sharp drop August–October, and a slight peak involving few years in January–February. In April–July songs sometimes were heard before dawn (roughly 06:00 h), from as early as 05:20 h, and occasionally after dusk (roughly 19:00) to 19:13 h, but usually started after 06:00 and ceased *c.* 18:50 h.

Breeding. Does not follow the schedule for this region given by Brown & Britton (1980) and Urban *et al.* (1997), largely or entirely based upon a double-rainy-season regime. Here, breeding occurs almost entirely in April–August, during the big rains and July–August rains, and between them. Only after a very wet year (1997) was there breeding in normally dry February (and independent young January–February). Nests were in April–July, except for one in February, fledglings (dependent juveniles) were seen April–October, immatures on their own occurred July–February, and displays were noted April–July. Song peaked in May (preponderance clearly April–July), and cloacal protuberances and brood patches were noted April–July and, in the one year, February. Nests were at 2–6 m (mean *c.* 3.3 m) in various bushes and trees, including *Rhus natalensis*, *Euclea divinorum*, *Spathodea campanulata*, and *Olea europaea*; two were in unidentified, leafless dead saplings or bushes beneath taller trees. We approached few of these, because of the great risk of nest failure – indeed, most nests failed (due to heavy rains, but mainly predators, importantly including Gray-headed Bush-shrikes). Nests have been well-described by Chapin (1953), van Someren (1956), and Urban *et al.* (1997), and from southern Africa by Maclean (1993), Steyn (1996), and Tarboton (2001). Those we found were usually taller than wide, and are as others have described them, varying chiefly in the presence or absence of leaves, and of any twiglets incorporated in them. Lichens were present on the outside of all, to a varying extent, and even in trees lacking lichens. Eggs were two and three in the two nests we examined, and were pale buffy white or pinkish white-buff with a wreath of pin spots around the larger end, and a few fine spots elsewhere, the spots being red-brown to lavender. We never saw more than two fledglings, but there could have been others if separated from one another.

Specimen data. Some paradise monarchs were released because we had too little time to treat them, and feared harming them if left in netting bags for long; we also released recent fledglings immediately. Other factors were involved with nesting birds; one nest was aban-

done on the day we netted the M near it (the pair recycled later in the year). We have data for 21 adult MM, 17 adult FF, seven immatures sexed as MM (white markings in wing, tail elongated in some), three immature FF and one unsexed juvenile. No re-traps were obtained more than one year after netting (one immature M netted October, weighed 17 g, and when retrapped as a subadult three months later weighed 8.75 g, the lowest weight that we obtained). In weight 21 MM were 12.5–18 g (15.5 g), 17 FF were 12.5–17.5 g (15.1 g), seven young MM were 13.5–17 g (14.9 g) and three young FF were 12–14.75 g (the juvenile was 11.5 g). In wing length, 17 MM were 80–87 mm (83.9 mm), 15 FF were 71–85 mm (78.4 mm) and three young MM were 78.5–83 mm (two young FF were 73 and 79.5 mm). Weights average greater than those Urban *et al.* (1997) give for large samples of Kenyan *T. v. ferretti*, which includes our area despite many of our birds being white under the tail.

It is well known that various races of the African Paradise Monarch are polymorphic in color of MM (see Chapin 1953, Urban *et al.* 1997). The MM in our study area are highly variable; no two are alike in detail, and we concur with Urban *et al.* (1997) that designation of “morphs” or “color types” is misleading in dealing with more or less continuous variation. In the study area half or more of the MM are white, black and gray (in order of dominance of color), with little or no rufous (or chestnut). This is unusual in that populations farther S in the highlands have few or no “white” MM (Chapin 1953, Zimmerman *et al.* 1996), whereas the study area has many. As Chapin (*op. cit.*) noted, this may place more S birds in the race *suahelica*, which has no white-dominant MM. We developed a scheme for noting our MM, in which rufous and black predominant colors (with gray as well) were designated R/B, noting that these vary in amount of white edging in the wing coverts, edges of secondaries and edges of primaries. Those with much white in the wings and some white appearing in the tail were “classed” as R/BW, and those with more black and white (these increase in a correlative manner, together), as R/BBW. At the other extreme are very white birds with minor amounts of rufous, B/W, or essentially no rufous, B/WW (such MM match that shown in Chapin 1953: 727). We could readily note those apparently showing no rufous, being white, black, and gray, those with rufous, white and black (and gray), and those with white apparently restricted to the wings, these respectively being B/W, R/BW, and

R/B. In actual use in the field, this scheme broke down, because closer observation showed more complex patterns, and we likely were biased toward noting white-dominant birds. Roughly half the MM we saw were majority white-colored. The 21 netted MM included three B/W, four B/WW, one R/BBW, five R/BW, and eight R/B individuals. Putting these in three groups we compared the white extremes (B/W, B/WW), the rufous extreme (R/B) and the others as “intermediates” (R/BW, R/BBW). The seven whiter MM were heaviest and longer-winged (means 16.8 g, 85.8 mm, respectively), whereas the eight R/B MM were lightest and shorter-winged (15.1 g, 82.8 mm), and the intermediates were intermediate (16.4 g, 84.1 mm). Overall, the 21MM weighed 12.5–18 g (15.5 g) and had wings 80–87 mm (83.9 mm). The whiter MM are larger than the more rufous MM. The longest-tailed M (class B/WW) had white central rectrices 315 mm, and the longest-tailed rufous (R/B) M had rufous-chestnut central rectrices 265 mm. Interestingly, these color variations did not hold for immature MM; six could be seen to have non-molting plumage, four of which were R/B, one R/BW and one was R/B but whiter on the wings than any other (does the white extreme emerge only in adult plumage?). Although the central rectrices of adult MM may be rufous or white in more rufous birds, the tail varies much more than Urban *et al.* (1997) indicated for *T. v. ferretti*; some have one or two other rectrices white, even when R1 is rufous. Whiter MM show little or no rufous in the rectrices (the base of one or two feathers may show a rusty tint). The more white in the plumage of a M, the less black it shows in the shafts and edges of the rectrices. Another location of rufous in strongly white birds is along the back adjacent to the nape, where there may be a narrow rusty band.

Soft-part colors: These are expressed generally in such works as Chapin (1953), Maclean (1993), and Urban *et al.* (1997). Some features vary more than they indicated. The bill typically is pale blue, darkening to cobalt blue near the base, especially at the corners, and paling, sometimes to near-whitish, near black tip. One M had a gray-silver maxilla and blue mandible (tip black). The F usually has a less bright blue bill than the M. Immatures gain the adult bill color rapidly, but it may be duller, grayer. Fledgling juveniles have a mixed horn-colored and dusky bill (base more dusky, tip near yellow). The mouth is lemon yellow to greenish yellow, including the tongue, which may be gold with a yellow tip. The orbital wattle, narrower in FF, is cobalt blue, and in some

MM violet or blue-violet; it is less bright in some FF. In younger immatures it is gray, becoming larger and bluer with increasing age. The legs and feet are blue-slate to gray-blue. Molt: Only four of nine adults taken August–October and December were molting; these were the only conspicuously molting adults of the total of 38. Those months are appropriate for post-breeding, annual molt. Many MM seen have asymmetrical elongated central rectrices, but we are uncertain of molt in these individuals, as one of the feathers may have been lost and regrown, but not yet fully so, or one may develop more slowly than the other.

PLATYSTEIRIDAE Batises, wattle-eyes

Chin-spot Batis *Batis molitor*

Months. Resident in all woodland, bushland and gardens.

Ecology. Common in woodland, riverine woods, mixed open bushland (uncommon in uniform stands of leleshwa), and garden trees; tends to be at edges of dense riverine woods and forest. Forages for insects in canopy of trees, but more often seen in low trees and bushes, frequently hunting down to the ground. Sometimes forages over ground-feeding starlings and serins. Frequently seen in mixed-species foraging flocks that usually include other flycatchers (especially paradise monarchs), tits, orioles and others. Eats frog-hoppers (Cercopidae, Homoptera), gleaning for them at times. Widespread in the region (Lewis & Pomeroy 1989). In dry periods was the only resident flycatcher in degraded bushland-woodland at GMF. See Urban *et al.* (1997) for other aspects of ecology.

Movements. Local, as in dispersal, only.

Behavior. Rather well discussed by van Someren (1956), Urban *et al.* (1997) and Harris & Franklin (2000). As in most flycatchers, interacts with other species hawking insects, including other species of flycatchers and drongos. Joins birds mobbing Pearl-spotted Owl-ets. Wing flips noisily, as well as snapping bill during interactions (on 2 September 1987 at ML two FF fought noisily for c. 15 min); aerial chases involve much wing flipping, bill snapping, buzzy calls and songs (of MM). We rarely saw complex interactions involving four to six individuals. MM courtship-feed FF, and the M feeds the F in the nest.

Voice. See Maclean (1993), Urban *et al.* (1997) and Harris & Franklin (2000). Song most prevalent April or May through July, tapering off in August–September, and with a minor peak December–January. The song is of soft whistled notes, with a strong ten-

dency to rise or drop. In our area songs are longer, generally, when breeding, but (*contra* Urban *et al.* 1997), occasional songs of four to five notes are heard throughout the year. A song may be “ee-oo-oo-oo” (or “oo-oo-ee”), it may be all in one tone (“ee-ee-ee-ee”), and, when breeding, may be longer than Urban *et al.* (1997) indicated, with up to 18 notes at times. Songs were heard as early as 06:10 h and as late as 18:30 h (in May). Non-breeding shorter songs tend to have notes all at one pitch. When breeding, the F adds “zit-zit” notes to the “ee-oo” song of the M in a duet (or she may snap bill in time to the M’s song). The song also may include “greet” or “guerck,” honk-like notes mixed with whistled notes. Some songs are fully buzzy and honking in quality, punctuated by bill snaps. In M-M chases we heard “kkk-eeet, kkk-burreet” notes, and in M-M flight displays “chip” notes, wing flitting sounds (“snip”) and bill snaps were heard. FF gave “feerp-erp” and “preeep-preeep” calls; birds in hand called “peep-eeep.” Bill snaps were mistaken for snappy nasal notes or ignored by Stevenson & Fanshawe (2001: 418).

Breeding. Breeds mainly April–August (all occupied nests and dependent juveniles were from these months); occasional breeding December–January is indicated by a M with a cloacal protuberance (January), a F with a brood patch (December), some displays and complex songs in those months, and three (older, independent) immatures in December. The preponderance of song April–July and molting batises late April–November fit such a breeding scheme. Nests seen were between two or three branchlets, composed of fibers, rootlets and twiglets bound with spider webs and covered with lichens of the color of those on the surrounding branches, and situated 1–9 m above ground. Trees used were: *Acacia gerrardii*, *A. xanthophloea*, *A. abyssinica* (two), *Canthium* sp., *Euclea* sp. (two), leleshwa, and *Olea europaea*. Several nests were hidden by foliage (adults carried nesting material, or food to the sites). We avoided disturbing nests, hence only glimpsed contents; four nests had dark-spotted bluish or greenish eggs (see Tarboton 2001: Plate 120) or in one case a hatchling and an egg. Nests had but two eggs, adults with fledglings had only one or two with them, and we have no evidence of broods greater than two, the usual number (Urban *et al.* 1997, Tarboton 2001). The breeding of this batis to take advantage of the two rainy seasons (big rains plus July–August rains) puts it at variance with seasons given by van Someren (1956), Brown & Britton (1980) and Urban *et al.* (1997).

Specimen data. We netted 15 MM, 21 FF, four immatures that we could sex as MM, four immatures sexable as FF (from immatures in fresh plumage to subadults with clear indications of their immaturity), and one unsexed juvenile. The 15 MM weighed 10.6–12.8 g (11.7 g) and had wings 58–62 mm (60.8 mm, $n = 9$). The 21 FF weighed 9.75–12.8 g (11.6 g) and had wings 54.5–63 mm (60.0 mm, $n = 13$). The four immature MM averaged 11.2 g, and four immature FF 10.8 g; the juvenile weighed 11.75 g. These represent *B. m. puella*, although the weights average 2–3.5 g heavier than Urban *et al.* (1997) gave for nominate *molitor* in Kenya; in wing length they match *molitor*, which, according to those authors, has the wing length as *puella*. Several batisses were retrapped 22, 31, and 41 months after first captured. Soft-part colors: Mouth of MM black with tongue pink; that of FF and immatures is pink with black at edges (beside tomlia) of bill. Eyes of adults are yellow (lemon yellow) or greenish yellow; the eyes of older immatures are very pale yellow, whereas younger birds have the iris white or gray-white (latter in juvenile). Other colors are as noted by Maclean (1993) and Urban *et al.* (1997).

Black-throated Wattle-eye *Platysteira peltata*

Months. January, April–June, August–September, December, 10 records since 1989.

Ecology. Probably uncommon resident about remnant forest at Nglesha; only two records elsewhere (LU, MK). Known just W and S of the area (map of Lewis & Pomeroy 1989), but not elsewhere on the Laikipia Plateau. Seen feeding in *Acacia abyssinica* (with a Chinspot Batis nearby), also in dense cover along the stream at NG, and in the forest understory there.

Movements. Probably dispersal movements only; the young F netted at MK was presumably moving along the Mukutan River. We think the three subadults netted were produced at NG.

Behavior. Snaps bill regularly as it forages, displays seen with wing-flipping in the air of M before the F (see Urban *et al.* 1997).

Voice. Snaps bill, flips wings noisily in displays. In chase of F by M, “jink” notes were heard. An immature M in hand called “chit-chit” (called a mobbing call by Urban *et al.* 1997). A few songs heard in January at NG and September at IU, the song a series of “wee” notes (“wee-wee-wee-WEE-ee”).

Breeding. Brown & Britton (1980) gave April–June and August–November as periods of breeding. We saw courtship in April, heard songs January and September, netted a younger immature August and older immatures June and August, and an August adult was

molting (completing molt). These suggest April–August and perhaps January as periods of breeding. The subadult netted at MK 20 June 1991 was nearly adult (F), but had three brown secondaries and a few brown back feathers. The subadult M of 12 August 1990 was an adult with *c.* four brown breast feathers. The immature M of 7 August 1989 had a mixed brown/black breast band, brown wings with buffy tips of greater and median coverts; its back and crown were adult (glossy blue-black).

Specimen data. Four netted, two MM (subadult and immature) in August, a subadult F netted June, and an adult F taken in August. These weighed 13.5–14.75 g (subadults) and 14 g (F). Only two subadults could be measured (wing 67 mm in a F, 68 mm in a M). All had the black parts of their plumage glossed blue, not green. The blue tint and heavy weights are those of W Kenyan *P. p. mentalis*, not of *P. p. cryptoleuca*, smaller and greener, found E of the Rift Valley (Urban *et al.* 1997, Schifter & Cunningham-van Someren 1998; Zimmerman *et al.* 1996: 224 mistakenly assigned greener coloration to *mentalis*); all four of our birds exceed weights of 13 Somalia and Kenya *cryptoleuca* given by the first authors above. Soft-part colors: Urban *et al.* (1997: 572) give a confused statement of iris color of this species (“eyes brown, outer ring purplish or gray, iris white”). Juveniles supposedly have a red eye. The iris is paler close to the pupil; this inner ring was pinkish to reddish in all four of our wattle-eyes, and the outer ring of the iris was dull red or crimson in the subadults, and plum red in the adult F. All four had the upper anterior eye wattle bright red, as in adults. Thus color variation between immatures and adults was very limited in our wattle-eyes’ wattle and eye colors.

TIMALIIDAE Babblers, chatterers

Rufous Chatterer *Turdoides rubiginosus*

Months. Inconspicuous but common resident.

Ecology. Occurs in edges of woodland, bushy luggas, degraded bushland and woodland, thickets in wooded and bushed grassland, about gardens, and bushy pastures throughout the study area. Lewis & Pomeroy (1989), Zimmerman *et al.* (1996) and Fry *et al.* (2000) gave 1500 m as its uppermost limit, but occurs to over 2000 m (the upper limit by Stevenson & Fanshawe 2001) in SW and NE (about Kuti Hill), as well as at 1950 m at Nanyuki. Commonly seen near Main Gate at 2010 m. Inconspicuous, partly because utters high-pitched, soft notes unnoticed by most observers; it feeds beneath bushes and retires to cover at any threat.

Forages mainly using the bill, bounding about, pulling at, picking and tossing debris about; tears at wax and debris for insects at honeyguide feeders. Also feeds on mango and papaya rinds. Larger Brown and Black-ored babblers dominate the chatters, but chatters follow Brown Babbler groups, foraging behind them or bathing after them, fleeing on their approach. Occasionally forages with Brown Babblers, and once with Black-ored and Brown babblers, with little interaction. Also forages with feeding francolins at times, and other birds. Bathes frequently when water is available. Groups number three-13 Rufous Chatterers, with four-five the usual number; the groups are smaller than those of the other two babblers, and the chatters have a larger territory (rarely can one find two groups of chatters near one another). After breeding their numbers are augmented by one or two young. No movements are known.

Behavior. Is attracted to choruses of Brown Babblers, approaching and watching them, then following them or moving away. When two groups meet, as they infrequently do, both chorus, then individuals representing the two groups of chatters may come together and fight in the air, or on the ground. Eventually the groups move away from one another. Occasionally Rufous Chatterers join in mobbing a predator, but only at a distance and by calling from the protection of a bush.

Voice. Its rather soft, peeping, whistly calls are responsible for its name of "chatterer." The song, uttered by one chatterer (M, presumably) from the top of a bush or tree, is a series of four to nine notes similar to some calls, but variable, often rising in pitch, and sometimes decreasing in pitch and volume through the song. We referred to its song as a tinkling twitter. Examples are: "pa-pee-pee-see-pit-nyeeeah," "tsee-tsee-see-ee-ee-ah," "hweet-fweet-fweet-fweet-fweet-fweet-weet," and "skeek-eek-eek-eet-eet-tee-peeet-peeet." Constantly gives soft "pee" or "peep" notes (also "dit," "deet," "peew," "eee") and sometimes series of song-like notes in a chorus among the group. A soft "psee-eeo," rather like a soft call of African Black-headed Oriole may be an alarm note; also loud, sharp "weet" in alarm. Fighting members of two groups that have met may give loud "twee-keek" calls, loud "tee" calls, or a swift-like "pseeeeeeeee." Also has questing "eh-eh" or "u-eh" call. Once used to their calls, the observer can follow their progress through the bushes (notes are less raucous and loud than those of congeners but chatters are as vocal, if not more so, than congeners *contra* Zimmerman *et al.* 1996). Vocally like *N. T. fulvus* (see Cramp & Perrins 1993).

Breeding. Secretive, no nests were found. Immatures were netted January–February, and seen in January, May and July; two adults carrying nesting material were observed April, and one carried a grub across a road and into bushes in June. Together with the prevalence of songs April–July and October–January, the data indicate that Rufous Chatterers in the study area breed during big rains and into July–August rains (April–July), and during and following the little rains (October–January). Brown & Britton (1980) had sparse records from the region February–April, June and August. Those nesting late in the year would avoid brood parasitism by Levaillant's Cuckoo, which is absent during that time. Territories of unknown size, but are large; only occasionally can a group be found about a site on two consecutive days, except when breeding nearby. During dry February–March and October, noted every 3rd to 15th day, if then, about GMF, where found daily in April–July and December. We never saw more than two fledglings (gape wattle visible, eyes dark) or immatures (brownish to grayish eyes) with any group, so probably lays 2–3 eggs (Fry *et al.* 2000).

Specimen data. We netted seven adults and two immatures, of which but two (April, November, the others being from January–February, and June) were not molting. Adults weighed 38.6–49 g (43.9 g) and four had wings 81–87 mm (83.1 mm), about as given by Fry *et al.* (2000). Two were netted together (with a third adult) 13 June 1990 at GMF, and were retaken together just over a year later, 29 June 1991; both were in molt in both years. The immatures weighed 36.75 g and 41 g. We noted variation in the tone of rufous below and presence of pale shaft streaks on breast that makes worn birds look streaky. Most had a buff supercilary stripe, noted in the field. The crown and especially forehead feathers are bristle-like (hardened). The birds represent the nominate race. Soft-part colors: The bill is often portrayed as yellow (see Fry *et al.* 2000); the maxilla is gray or dusky with yellow to horn tomlia, and the mandible is yellow or horn-colored. The bill is dull horn-yellow in immatures. The mouth is yellow with pink rear and the tongue yellow-flesh in adults; the mouth is pinkish yellow or gold with yellow gape flange in immatures. Eyes were yellow to pale yellow in the adults and gray-brown to whitish gray in immatures. Eyes of immatures look distinctly darker than those of adults in the field (immatures generally follow the adults, and are shy about coming to water and to food sources – they "tag along" and are conspicuous only if still begging).

Black-lored/Sharpe's Babbler *Turdoides sharpei*

Months. Widespread resident, locally common.

Ecology. Our largest babbler, became more widespread following the burning of the late 1980s. Generally occurs in smaller groups that have more extensive home ranges than Brown Babbler; the latter is invariably more common, if less conspicuous. Is darker, more uniformly brown and blackish than slightly smaller Brown Babbler; is less streaked, has black lores, eyes flash white, mouth lining is yellow, is shorter billed and shorter tailed than the Brown. Seems to prefer more open areas than Brown, probes in lawns for insects, bounds after termites. More often feeds on hanging carcasses at Center than does Brown Babbler, perhaps because it is dominant over the latter. Interacts at times with usually larger Brown Babbler groups; a Black-lored group may supplant a Brown Babbler group, moving in on them when they chorus. Lone dispersing Black-lored Babblers may join a Brown Babbler group, following it about. Occasionally feeds with Brown Babblers; also forages with starlings *Lamprolornis* spp., Crested Francolins, ground-foraging Nubian Woodpeckers, wood-hoopoes and Crowned Hornbills. Tends to forage higher in trees than does the Brown Babbler. Bathes in bird baths and puddles, "pushes" Brown Babblers and Rueppell's Long-tailed Starlings out of its way to bathe. When not breeding groups wander widely; appeared at GMF sporadically in February, May–June, and September–October.

Movements. Dispersed into the study area probably from the S and E (Lewis & Pomeroy 1989) 1989–1992; 90% of records since 1989. Originally around human habitation, and in open bushland of the S and E of the area.

Behavior. Interacts with Brown Babblers, supplants them at times. Tends to mob predators as a group rather than with other birds (which it may intimidate). Gives alarm calls at Levillant's Cuckoos, and two chased a Levillant's Cuckoo 10 July 1992 in NP. Aggressive, "pushy," supplants smaller birds to the size of Superb Starlings at will. One or two adults wave wings during choruses; wing-waving birds tend to "lead" the group about. One copulation observed, without prelude, in the open on a dead olive stub at MB 12 July 1989. Behavior probably somewhat like that of Arabian Babbler *T. squamiceps* described by Zahavi (in Cramp & Perrins 1993), but until marked, sexed birds are studied we can offer little information. Is found in groups of two–10, mainly four–five, year-

round, but conceivably breeds in pairs (potential brood parasite Levillant's Cuckoos chased by only two babblers; never more than two juveniles seen with any group, thus possibly monogamous).

Voice. Complex; occurrence of choruses by all members of a group masks individual contributions, and "songs," if any. Calls loud and harsh, responsible for name "cat-bird" given it in Uganda (Jackson & Sclater 1938); "nee-yeah" calls not like those of other Kenyan babblers, resemblance is to calls of southern Black-faced *T. melanops* and Hartlaub's *T. hartlaubii* babblers. Choruses often higher in bush or tree than those of Brown Babbler, hence conspicuous; contain numerous "chee," "chak," "nyeeak," "klop" and other notes. There are more high-pitched notes in counter-chorusing between groups. A lone bird atop a euphorbia uttered a screechy "peeah, pee-dok, peeah, pee-dok" series. Choruses are heard all year, but repeated, complex chorusing is notable April–September, and December–February.

Breeding. No nests discovered. Two bob-tailed juveniles, recently fledged, with a group in late January, another netted February; otherwise juveniles noted July–September, and copulation seen in July. Frequent and complex chorusing heard April–September and December–February, during and following all three rainy seasons. Brown & Britton (1980) had only three records for the entire region, in May and July, in accord with our dates. Gray-eyed juveniles follow the group members, begging from them (see Fry *et al.* 2000). Molting birds are known from July and February, appropriate to molt occurring late in breeding season.

Specimen data. We netted five adults and one juvenile of this wary babbler. The adults weighed 76.5–83 g (mean 80.8 g); two had relatively unworn wings at 114 and 116 mm (these babblers exhibit heavy wear of the wings, and especially the tail). These are near averages given by Fry *et al.* (2000); the nominate race is in the study area. The juvenile weighed 77 g. Eyes of this babbler have a narrow brown inner ring and a broad white or gray-white outer ring (the eyes are conspicuous as the birds move); in juveniles eyes are darker, more brown or gray. The mouth is yellow, as is gape flange in juveniles (the mouth is blackish in the Brown Babbler). These soft-part data are previously unreported. One adult color-banded at Center 14 February 1985 was observed nearly 20 months later, 1 October 1986, feeding on a carcass hanging in the meat shed at Center.

Brown Babbler *Turdoides plebejus*

Months. One of the most numerous birds of the study area.

Ecology. Occurs in all wooded and bushy habitats, as well as around human habitation; rarely appears in open more than 1–2 m from cover, as occasionally under lawn sprinklers, where subordinate to Black-lored Babblers. Supposedly (Lewis & Pomeroy 1989, Fry *et al.* 2000) not occurring above 1500 m, though long ago (Jackson & Sclater 1938) reported at 2285 m. Fry *et al.* (2000) limited it to W Kenya. Stevenson & Fanshawe (2001) gave limits as 600–2000 m. Short *et al.* (1990) reported it from the Laikipia Plateau; it occurs at 1500–2100 m in the study area, and extends E at least to Nanyuki at 1950 m. Social, moves about in groups of three to 14 individuals (average *c.* 7), hopping, bounding and occasionally walking, usually on ground, but sometimes foraging in bushes and low in trees. Generally flaps wings, then glides, crossing roads and open areas one-by-one. Forages chiefly by gleaning, pecking, probing, and lifting leaves and other debris to look beneath them; uses a scythe-like motion, side-to-side in seeking insect prey in drying beeswax. Eats ants, beetles, mantids, termites, inchworms and, in beeswax, wax-moth larvae; also eats beeswax, fruits (berries of *Carissa edulis* and mangoes and papayas put out for birds) and, less often than the previous species, meat and suet from carcasses hanging in Center's meat shed. One group fed for 3 h on insects and beeswax in our shed. Bathes daily when water is available, often chorusing at puddle or birdbath. Occasionally sunbathes. Frequently feeds in mixed-species foraging flocks with diverse birds, and dwarf mongoose parties; strongest association is with Rufous Chatterers, the latter follow it. Appears very strong-legged, can make prodigious bounds; is aggressive at times (as at birdbaths) to other birds its size and smaller. It is dominant over Rufous Chatterers but subordinate to Black-lored Babblers (two or more of the latter can dominate a group of the former). Brown Babbler groups wander widely and numbers diminish during extended droughts, but no movements occur beyond these (and dispersal).

Behavior. When two groups meet, extended chorusing and displaying occur across the their boundary, usually at 30–50 m apart. Confrontations occur at any time of the year, may fight. Alloprens in pairs, once pair then led chorus of the six babblers of their group, and darted forward, prancing before birds of the second group. Adjacent groups used our bird bath; an incoming group chorused repeatedly, causing de-

parture of the group at the bath. Chorusing babblers partly spread the wings, bow, and spread and close the tail as they chorus. Intergroup chorus conflicts are more animated, with more spreading of wings and tail, deep bows and turning of body widely from side-to-side; the wings flip with each note. Three adults perched together, the two outer birds alloprening the center babbler that was then replaced by a fourth adult that was preened. On another occasion two adults pecked a subadult, the latter lay down on the ground; one adult perched atop the subadult, pecked it, then shifted to alloprening it. Likely dominance relations play a role in this social behavior. A group seven times seen chasing an adult Levaillant's Cuckoo. One March a Black-and-white Cuckoo was seen stealthily following a group of Brown Babblers for 3 min. Mobs predators; several called at an immature Gabar Goshawk that dropped the head of a nestling Brown Babbler.

Voice. Jackson & Sclater (1938) termed its calls an irritable chuckling. Its choruses contain various more or less noisy and harsh notes, although overall effect is less loud and harsh than are choruses of Black-lored Babblers. Some notes from various choruses are: "che" (or "chi") notes, a "cha-a-aa-aa-a," a "tye-tye-tyek," "pi-chep" notes, "tyaw-tyaw," "yik-tyak," "skrek" notes, "aak" notes, and rough "ske-ge-gek" notes. A "t'chuk" note or two often leads into the chorus, and such notes heard before the first morning chorus. Overall, choruses were heard from 05:55 to 19:08 h, but were rare before 06:00 and after 19:00 h. During breeding periods the initial chorus of a morning triggers chorus responses by neighboring groups within 3–4 min. Choruses are uttered from a bush or low tree, but occasionally may chorus from the ground, the edge of a bird bath, and once, the open top of a 25-m tall *Acacia xanthophloea*. Choruses and especially the complex ones, are most frequent April–July and December–January, but are heard year-round. Other calls include a series of "peep" notes rather like the common calls of Rufous Chatterers. Bannerman (1936), Zimmerman *et al.* (1996) and Fry *et al.* (2000) reported other notes, or variations of those given above. Alloprening adults called "nyi-nyi" and "pit-pit." Begging young repeatedly call "kyi-yi" and flutter their wings, or call "t'weet-weet-weet."

Breeding. Nests in April–September (mostly May–August), and also November–January. Nests were aptly described by Chapin (1953) and Fry *et al.* (2000), and are bulky, appearing at times ball-like when viewed laterally. Constructed at 0.75–5.5 m in bushes and

trees such as *Tarchonanthus*, *Euclea*, *Rhus*, *Carissa*, and *Olea*, nests were 12.7–23 cm wide and *c.* 10 cm deep. Most were in or near edges of woods, or in thickets, but one, in a dense *Rhus* sp. bush 2 m high (nest 0.75 m from ground) was in pastured *Combretum* grassland 35 m from the border of bushed woodland. Several nests contained pieces of spiny *Acacia brevispica* branchlets. We saw few eggs, which numbered two to four, as noted by Chapin (1953) and Fry *et al.* (2000); eggs had fine reddish spots on a bluish background. Of the products (eggs, or nestlings, or dependent juveniles) of 34 nests, only two were Levaillant's Cuckoos, although we did not see and could not follow up on nine of 18 nests that we found, and a few of these could have held cuckoo eggs or nestlings. Dependent, juvenal babblers numbered up to four in apparently full broods that we saw, with two being the most frequently noted. The young are fed by one to three adults coming in at a time; in early stages single feeding adult often stayed in the nest, brooding the young. All adults of group feed the young after fledging, and youngsters accompany the group as it moves. Juveniles beg from nearby adults, with occasional success in being fed, long after they are foraging on their own. Those groups risking breeding after the little rains, in November onward, avoid the risk of nest parasitism by Levaillant's Cuckoos which are then absent from the area.

Specimen data. We banded 52 individuals, and found that these long and strong-legged birds lose bands frequently (information from well-observed groups at camp), although some individuals tolerated them well. Seven birds provided retrap data from 13 to 43 months after banding, with five having been taken five to seven times. Weights of 44 adults were 61–79 g, but three June–July babblers weighed over 80 g, one, a laying ♀, 88 g; one M with a healed, formerly broken leg weighed 59.25 g. The mean was 69.2 g. The weights are greater than those reported for Kenya by Fry *et al.* (2000). Three immatures weighed 51–60 g, and four subadults were 64.5–71 g. Most babblers were molting (May–February), with only April (no birds in March, October) individuals not molting. The 11 non-molting adults had wings 97.5–111 mm (mean 102.60 mm). In the field this babbler has a notably pale gray rump; the Black-lored Babbler has the back and rump concolored. The Brown Babbler also has a faint white loreal mark (unlike lores of Black-lored). Early nestlings are dark-bodied with an orange-bill. Juveniles are paler gray and (buffy) brown than are adults. Soft-part colors: The bill is blackish,

except in nestlings (see above); bill often is dirty. The mouth lining is orange-yellow in nestlings, dull fleshy yellow in juveniles, and black (sometimes patchily gray and black) in adults. The tongue is yellow, and may be black tipped in adults. The gray orbital skin of juveniles darkens to black in adults, which have a dull, fine yellow line in the upper eyelid. Eyes are grayish to brownish or greenish in young, gradually acquiring yellow color in the outer iris; subadults have pale yellow eyes; and eyes of adults are yellow (possibly brownish yellow in some) inwardly, grading to bright yellow, gold or orange at the outer rim. These data enlarge upon those given by Fry *et al.* (2000). Black-billed, black-gaped, gold-eyed adults in fresh plumage (gray-brown, grayer on rump, with buff edges of head feathers, white and buff about the lores and on chin, and white-tipped throat-to-breast feathers) are clearly identifiable when seen in good light, as in the open. The birds represent the race *cinereus* (Fry *et al.* 2000).

REMIZIDAE Penduline-tits

African/Gray Penduline-tit *Anthoscopus caroli*

Months. One definite record, September; vagrant.

Notes. This oddly uncommon bird was seen at NG 12 September, 1986; two crept along a nearly horizontal tree branch at 10 m. Possibly seen at Lugwagippe Dam on two occasions in 1987 and 1988, but at very long range. Lewis & Pomeroy (1989) showed it occurring in almost mosaic fashion about our region. Known from Lake Baringo in March–May and October–November (Stevenson 1980), but not noted at Lake Bogoria (Hartley 1986), it occurs to 2200 m in woodland, but is nowhere common (see Fry *et al.* 2000). East of our area, it was reported at Mutara by Olson *et al.* (undated MS) in July 1984, and is known at Pinguone (Schulz & Powys 1998). Reasons for its sporadic occurrences and scarcity are unknown.

PARIDAE Tits

White-bellied Black Tit *Parus albiventris*

Months. Common resident, all wooded areas and their edges.

Ecology. This widespread upland tit was found at all sites, frequenting woodland, forest, and woodland edges, riverine woods, trees about habitation, bushland, and wooded and bushed grassland. Generally in pairs, these occupy large territories; no more than one pair was encountered at or near a site (exceptions were NG, LU, SI, and PO, all with extensive woods),

and they were not seen on every visit. About camp they were heard or seen about every third or fourth day, hence they wander over large territories, and are localized only when nesting. Habits are typically tit-like (Cramp & Perrins 1993). Forages in pairs and family groups of up to six (one group of eight, 2 July 1988 at MK), clinging, hanging upside down, poking into leaf clusters and working over bark, from near ground to the canopy. Often forages in low vegetation in open ground near woods. Feeds mainly on its own (though not aggressive and often seen near other small birds), but *c.* 25% of foraging is with mixed-species foraging flocks of various species (over 25 species), especially of *Batis*, *Oriolus*, *Terpsiphone*, *Apalis*, *Campephaga*, *Zosterops*, and bulbuls. Rarely pauses, almost continuously seeking food. Infrequently flycatches for termites, often eats termites taken from tunnels on bark of trees. We have not seen it eat other than insects. It occasionally moves with and forages above groups of actively feeding dwarf mongooses. Very regularly bathes in bird baths. One observed sunning itself, with wings spread, head to one side, and feathers erected, on three occasions. Very confiding, allowing close approach by humans. We have seen no movements by this tit, other than dispersal.

Behavior. Calls at Brown Babblers close to it, occasionally mobs with other birds; one called and then hid in a dense bush when a kestrel flew over. Members of a pair forage relatively close to one another, and keep in contact by calling. FF wildly solicit before MM when breeding. One of a pair may bob up and down and turn the head side-to-side as it calls to the other. Sometimes a tit may lift its head and peck the air to one side, then the other. M may chase the F and attempt to copulate. Early in nestling period the F does all feeding of young; M brings food to her at the nest, or she comes out to meet M, soliciting-begging before him, then takes insect and feeds the young. Later in nesting both enter the nest to feed the young.

Voice. Reasonably well known (Harrap & Quinn 1996, Fry *et al.* 2000). One common call is very like those of American chickadees (e.g., *Parus atricapillus*), a "tchik-dee-dee-dee," to harsh "zzherri" notes in series. Also gives "tchur," and squeaking calls, and, during M-F displays a "tseet-tsi-tsi-tsee." In hand, calls "faa" repeatedly. Its song is uncommonly heard, perhaps because it has no emphatic tones. Usually in 2- or 3-note phrases twice repeated, sings "tsee-tsa-seea," "cher-wee," or "chee-wee-a;" more rarely a "tchee-wee-wa-zheet-zheet." Usually songs are heard after 06:30 h

and before 18:30 h. They occurred in all months, but chiefly in May–July. Nestlings utter fast "ti-ti-ti" series when begging.

Breeding. Nine nests found in May–July (months when songs are commonly heard), and dependent juveniles in May–September and once in December (1994). Brown & Britton (1980) reported breeding March–May and December–January, but likely had no records from our area, with its three rainy seasons; breeding in the study area coincides with the later big rains, period between rains, and early in (or occasionally through and after) the July–August rains. Nests (also used for roosting) were minimally worked, natural holes and crevices at 1.25–4 m or more in such trees as the very gnarled, hole-bearing olive, *Euclea* sp., *Combretum molle*, and *Croton* sp. Some were in obviously rotted knot-holes. The nest at 1.25 m was beside a well-traveled path in a mainly live olive tree 8 m high; two young fledged from it 14 June 1990. We could not see the contents of most nests, but observed four young in two nests and three in another. At one nest the parents changed over at 30–40 min intervals. After fledging, young remain for an unknown period; in the study area, we saw only single tits or pairs January–March and November, and one or more family groups in other months.

Specimen data. Adults are shiny blue-black; immatures lack the sheen, the dark areas are sootier (even chocolate on head and face), and the white areas are "powdery" white with a touch of creamy tone. The forehead may be brown in adults through fading and wear. We netted 20, and managed to weigh 14 adults and three immatures. The adults weighed 19.5–24.5 g (mean 22.2 g); the immatures were 21–23 g. Data closely match those of Schifter & Cunningham-van Someren (1998) from W Kenya. Fry *et al.* (2000) provided no weights. Molting tits were seen May–September, with one completing the molt in February. Ten measurable adults had wings 73.5–83 mm (78.5 mm). One adult banded in the MK 2 February 1986 was retrapped, minus one band, 2 July 1988, and again 1 November 1988, 33 months after the initial banding. Some tits may be able to remove plastic bands. One other adult was recaptured 11 months after it was banded. Soft-part colors: The bill is black, sometimes with a horn tip; immatures have a grayer black bill with the tip and often the tomlia pale yellow to horn-colored. The gape wattle of young also is horn-yellow. The mouth lining is yellow-pink to pink. Eyes are dark brown and orbital ring gray-black in adults; immatures are brown-eyed with a gray or-

bital area. The legs are grayish blue. These data add to the bare details of bill, eye, and leg colors given by Fry *et al.* (2000).

LANIIDAE True shrikes, fiscals

Red-backed Shrike *Lanius collurio*

Months. November–December, April–May; rare Palearctic migrant.

Notes. We garnered three records November–December, and 15 in April–early May. It spends the boreal winter from S Kenya southward, and occurs at diverse elevations (Lewis & Pomeroy 1989, Fry *et al.* 2000). The three records for May were all 1–10 May, 1996. They are a bit late but Harrison *et al.* (1997) have this shrike in South Africa as late as late April, and Cramp & Perrins (1993) gave 22 and 28 May records for it in Malawi, and records into June for Zambia, these presumably shrikes moving N, so can be expected in Kenya into late May. Only occurs in open, degraded bushland and woodland, at edges of woods, about fences in pastures, and near or on dams. Four were seen in old bomas. They usually fed below 1.5 m, dropping on insects from bushes. A first-year Red-back was mobbed by a half-dozen Yellow-rumped Serins and followed by a calling Red-faced Sylviitta near PK 8 November 1992. A late migrant or wandering M foraged above and alongside a moving group of Brown Babblers at MB 25 December 1988. Most shrikes were MM. A F netted at TA 13 April 1994 weighed 26.5 g and had wings 88 mm; the bird represented the nominate race, as indeed did all those that we observed closely (Lefranc & Worfolk 1997, Harris & Franklin 2000). The F had completed its pre-breeding molt (Jenni & Winkler 1994).

Red-tailed/Isabelline Shrike *Lanius isabellinus*

Months. Four records in January, April, November and December; casual Palearctic migrant.

Notes. An adult M was on the bushy slope of Centre Dam 31 January 1997; another was in degraded woodland-bushland of NP 6 April 1994; a fully dark-masked F with red tail and finely barred sides was in degraded bushland about a tank much used by large mammals for watering near Kuti, 29 December 1996; and a first winter-plumaged Red-tailed Shrike was in the degraded High Boma area 25 November 1993. The last shrike, besides its red tail, had streaky brown loreal marks rather than a full mask, finely barred sides and flanks, and a white mark at the base of the primaries (as did the three adults). All appeared to re-

present the W race *phoenicurooides* (Cramp & Perrins 1993). Although usually found in lower, drier areas, it occurs to at least 2000 m (Lewis & Pomeroy 1989, Fry *et al.* 2000; Stevenson & Fanshawe 2001 gave it to 2200 m); the locations where we saw it were in situations, and twice at sites, where we have seen Red-backed Shrikes and its foraging is similar to that of this close relative (Lefranc & Worfolk 1997, Harris & Franklin 2000).

Common Fiscal *Lanius collaris*

Months. All; regular and at more sites after 1988.

Ecology. Found at scattered W sites (numbering 10) through 1988, near the time when extensive burning on Olari Nyiro Ranch was abruptly curtailed; more widespread but still local since then, it has occurred in 17 additional locations west from MB, the lower road to OD, Kuti, SI, and PO. Its center is the drainage of the Mukutan River, and especially Nglesha (that site and mainly the paddocks, pastures, and buildings of Nglesha Center) E to Nglesha Dam. Generally solitary, sometimes in pairs, and rarely concentrating (once eight within 2 km of Nglesha Center), it favors low, open grassland and pasture with fences, bushes or trees scattered about, for use as hunting perches. It also occurs in gardens, bushes around habitations, woodland edges, open places in riparian woods, and has a predilection for old bomas (open grass and tangled, bushy “fence” around former cattle and other livestock areas). From perches 1–10 m (usually 3–5 m) above ground flies out for up to 20 m, rarely to 80 m, to seize prey (Lefranc & Worfolk 1997, Fry *et al.* 2000, Harris & Franklin 2000). Occasionally hawks insects from the air, and hops about on the ground seeking prey. Its flight is strong and direct, with undulations only on longer flights, as to cross a pasture. Foods are treated by the works just cited; we have seen grasshoppers commonly as prey, and one took a frog at MK, impaled it on the thorn of an *Acacia xanthophloea*, and tore it apart as it consumed it. Territories were large, within the upper reaches of the 1–13 ha per bird noted by Harrison *et al.* (1997) and the 0.4–18 ha noted by Lefranc & Worfolk (1997). Mobs or aggressively chases many other birds. Is itself chased by birds such as weavers and bush-shrikes. We have not seen it preying upon small birds in the study area, although it is a well-known predator of nestling birds. Sporadically feeds near livestock, and one immature actively followed a group of warthogs pouncing on insects flushed by the mammals.

Movements. Movements are implied by the fact that this shrike was present regularly only about Nglesha; probably disperses, and contracts range with shifting conditions. Known at Lake Baringo only after rains (Stevenson 1980).

Behavior. Well known (van Someren 1956, Maclean 1993, Lefranc & Worfolk 1997, Fry *et al.* 2000, Harris & Franklin 2000). Puffs throat when singing. One viciously attacked and lengthily pursued a Lesser Gray Shrike 27 April 1990 S of acacia crossing. One adult, approaching to feed a fledgling, paused with a grasshopper in its beak, and twirled its tail a half-dozen times one way, then did the same to the other side, the display closely resembling those of the social Gray-backed Fiscal and its close relative the Long-tailed Fiscal *Lanius cabanisi*.

Voice. Well known, but much variation exists (see, e.g., Harris & Arnott 1988, Harris 1995, Zimmerman *et al.* 1996, Fry *et al.* 2000, Harris & Franklin 2000). The typical call we have heard is a buzzy, harsh "chzzzz-chzzzz," likely the aggressive-alarm call rendered "keeer-keeer" or "churr" by Harris & Franklin (2000: 175). A less buzzy but harsh "chaaaa" or "chaaa-eyer" and a less harsh "feee-ffew" were heard from apparently lone adults. Its songs are complex, and we have heard whistled, short songs and longer ones containing warbled, whistled and grating notes. Over the study period these were uttered throughout the year, except for May, August, and October, and most frequently in June and July.

Breeding. The only nest found was in May–June, but 16 bob-tailed juveniles were seen in all months of March through September and apparently independent (or well-flying dependent) immatures were encountered April–September and December. Along with the prevalence of song in June–July, the data indicate breeding March–September (especially May–August), and occasionally in October–December or later (e.g., the recently fledged bird in March, from a February nesting). The Brown & Britton (1980) records for the region are all from about Nairobi, and are concentrated in April–May and November–December; the three rainy seasons in the Laikipia sub-region account for a major peak between the big rains of April–May and the regular July–August rains. The nest was at 1.4 m in an *Acacia gerrardii*, in open, grazed wooded/bushed grassland N of Center; it was heavily built of twigs, fibers and rootlets with many feathers (of *Francolinus* spp.), mostly in the lining. The eggs were laid in late May, an adult was incubating through the first week of June, but on 7 June we found

the nest destroyed, with parts, including feathers, strewn all about under the tree. The clutch apparently was one or two, as we never saw more than two fledglings; possibly one or two eggs or nestlings were lost to developmental failure and predation. Clutches elsewhere are usually larger, *c.* four (Fry *et al.* 2000, Tarboton 2001).

Specimen data. Few were netted, as Common Fiscals are normally in more open areas than where we worked. Three adults and two immatures were netted, two adults at Center and the other three at MK. The two at Center weighed 33 g and 39.5 g, but were not otherwise measured. The MK adult of 3 January 1990 had just completed molt, and its primaries were not at full length; it weighed 26 g, a low late-molting weight. One molting immature, coming into adult plumage weighed 34.75 g, taken 24 May; a typical (Harris & Franklin 2000) juvenile netted 20 September weighed 37.75 g. Weights are within the range given by Fry *et al.* (2000). We assign these to *L. c. humeralis*, which they match, except for the fact that most FF likely have no, or very little chestnut on the flanks (Fry *et al.* 2000); thus only four or five fiscals could be sexed as FF out of more than 300 seen.

Taita Fiscal *Lanius dorsalis*

Months. Vagrant; two records, April, September.

Notes. A single adult, apparent M (no visible flank chestnut) was seen 29 April and 11 September 1995, on the degraded bushed grassland lower slope of GME. Its gray back, black crown to upper back, white humeral stripe, white outer rectrices and narrow white primary stripe were noted, along with its relatively short tail. It lacked white edges or marks at the tips of the secondaries. The September fiscal was somewhat soil-stained below, whereas the April bird was clear white below. In April the shrike was flycatching out from a perch in a dead bush; it gave a slightly burred, whistled "eee-heep" several times. The September shrike had preyed on some insect from the ground as we approached; when we were near it repeatedly wiped its bill left and right. Supposed to occur below 1500 m, but Lewis & Pomeroy (1989) mapped it throughout the Laikipia area, and it is reported E of the study area at Mutara (Olson *et al.*, undated MS) and Pinguone ranches (Schulz & Powys 1998). It does wander, including upslope (e.g., to Kericho, over 2100 m, Lewis & Pomeroy 1989; see also Lefranc & Worfolk 1997, Fry *et al.* 2000, Harris & Franklin 2000), and our shrike or shrikes may have come from the N and E in dispersing. We have not

seen its allospecies the Somali Fiscal *L. somalicus* in the study area; it has occurred at Mutara (Olson *et al.*, undated MS).

Gray-backed Fiscal *Lanius excubitoroides*

Months. Three records, four birds, August, September, December; casual visitor.

Notes. Observed at NP 5 August 1977, NG 12 September 1986 (two), and MB 25 December 1988. This long-tailed, gray, black and white shrike is distinctive in the white/black pattern of its tail from below, and in its Lesser Gray Shrike-like expanded black mask. The NP and MB fiscals hunted insects from low trees in open areas; the MB M was chased by two Brown Babblers when it flew after an item of prey near the babbler group. The apparent pair at NG were foraging down from low branches of *Acacia abyssinica* and edges of thicker bushes and trees in the open bushed pasture W of the stream at that site. Both were feeding, and did not call, but twirled their tails occasionally, doubtless conspicuous to them at 10–15 m apart, in sight of one another. Although usually resident westward from the Rift Valley, it does occur uncommonly E to Mutara Ranch (Olson *et al.*, undated MS) and the Nanyuki region (Lewis & Pomeroy 1989), and wanders occasionally up to 3000 m. It is common at Lake Baringo, W of the study area (Stevenson 1980). Breeding times in W and central Kenya (Fry *et al.* 2000, Harris & Franklin 2000) suggest that our records are of pre- and post-breeding wanderers, but the Mutara record is of a June individual; however, the January, June–August, and November breeding periods indicated in Brown & Britton (1980) and Fry *et al.* (2000) are based upon few records and none from our subregion, and studies by Zack & Ligon (1985) in the Rift Valley suggest breeding following any significant rains, so dispersal and wandering could occur at any time. Stevenson (1980) gave April–May as the breeding period around Lake Baringo, perhaps the source of our Gray-backed Fiscals.

Lesser Gray Shrike *Lanius minor*

Months. April of about half (eight) years, May 1995, 1996; frequent boreal spring migrant.

Notes. Frequent in some years (eight days noted in April 1993, seven days in early May 1995), absent in others. Favors open areas with tall bushes and small trees scattered about. Not at our study sites, and more often observed in the latter years of our honeyguide project when we were traveling among more sites. Most records were from Kuti to GMF, and S through Center to the bushed, short grass area S of Big Dam;

often seen near bomas. It is sometimes noted in loose groups of three to six, *c.* 50 m apart, but supplanting attacks occur when two are close together. Two MM hopping and hawking emergent flying termites from the ground, attacked one another, chased into a bush, then tumbled down in combat (both had pale pink breasts). Interactions were noted above with Common Fiscals, dominant over the Lesser Gray Shrike. The map of Lewis & Pomeroy (1989) indicates its occurrence in all parts of the Laikipia Plateau.

Southern Gray Shrike *Lanius meridionalis*

Months. April, ? May; casual visitor from N.

Notes. Several perplexing shrikes of this group (formerly Great Gray Shrike *Lanius excubitor*, recently split into N *L. excubitor* and S and E *L. meridionalis*, of which Asian migratory *pallidirostris*, if not a species “Steppe Gray Shrike,” is a race (Lefranc & Worfolk 1997, Fry *et al.* 2000, Harris & Franklin 2000; see also Beaman & Madge 1998), were observed, and three chased with vain hopes of obtaining a specimen. The only Kenyan record of any of these is one seen in far NW Kenya by Pearson *et al.* (1989) 17 February 1988, and assigned by them to Asian *pallidirostris*, thus ostensibly of the now-recognized Southern Gray Shrike; this Asian form is known casually in NE Africa (Fry *et al.* 2000).

There are at least two sources of “gray shrikes” as vagrants or casuals in Kenya (we ignore the remote possibility that *L. excubitor leucopterus*, a very pale, whitish form could be involved – there are no records of *L. excubitor* *sensu stricto* from Africa, Harris & Franklin 2000). These are: boreal winter and migrant *L. m. pallidirostris*; and non-breeding wanderers of sahelian *L. m. leucopygos*, or *leucopygos* *x elegans* (Nikolaus 1987). Both are pallid grayish, more or less masked, very white-marked shrikes. Although thought to be essentially resident, *L. m. leucopygos* is known to wander: there are seven records from The Gambia (Barlow *et al.* 1997) during December–April, and it has reached N Ghana in March–April (Harris & Franklin 2000; see also Barrow & Demey 2001), indicating movements of several hundreds of km. Such movements may well occur in E populations of this race.

Unfortunately, these two races are nowhere suitably compared, although both are illustrated by Lefranc & Worfolk (1997) and, on the same plate, by Harris & Franklin (2000); neither is shown in Fry *et al.* (2000). Both vary in several features. For example: *L. m. pallidirostris* has a dark-tipped horn-brown or gray-brown bill (the bill is black with some horn at

the base in *leucopygos*), but is variable, some breeding-plumaged shrikes having an essentially black bill (Cramp & Perrins 1993); also, some pink below is a major feature of (most or many) *pallidirostris*, *leucopygos* having creamy white underparts, yet Barlow *et al.* (1997) have the latter sometimes tinted pinkish. Of the shrike described by Pearson *et al.* (1989: 134), its horn-colored bill and gray rump point to it representing *pallidirostris*. However, its black mask including the loreal region (lores white, dusky or unusually blackish, but broken in *pallidirostris*) is a feature of *leucopygos*. Other descriptive points are ambiguous, (wing in flight with a white band "right the way across" is found in no race of *L. meridionalis*). They noted the tail as black with narrow white edging and white corners, yet both *leucopygos* and *pallidirostris* have an extensively white, restrictedly narrow black tail. Both races, especially *pallidirostris*, usually have a white supercilium (their shrike had none). Of course those authors lacked the recently published works cited above, and indeed their determination may have been correct. We also suffered from a lack of pertinent references beyond 1992 (Jonsson 1992).

On 8 April 1993, in an area of pastured grassland with scattered bushes and trees, we encountered two masked gray, white and black shrikes. The first was a long-flying, lanky, larger shrike, black-masked, with white supercilium stripe, a white scapular line, a white-appearing rump, a long tail with much white outwardly and at the tips, and wings showing a broad white primary stripe, and white-tipped secondaries. It was apparently white below. In stalking it we met with a shorter tailed, chunkier, masked shrike, pinkish below, clearly a Lesser Gray Shrike. This shrike flew more directly to nearby perches, and was less shy than the other. In passing one another one of them called "kik-kik-kik-kik-kik." The larger first shrike flew N far, 50–100 m or more each time we began to approach it closely; it disappeared, then presumably the same large, whitish shrike overflowed us to the S, more than 300 m. We were unable to re-locate it. On 6 April 1994, Horne with S. Njagi and J. Wachira saw a large, white, gray and black masked shrike in open degraded acacia woodland near Northern Plain Dam. Shy, it flew long and high when pursued. Its black mask extended just to the bill, over the lores, its tail was very narrowly black-centered with extensive white sides and tip, the wings showed much white, and it had a white supercilium. Its next flight took it a quarter km, into game habitat which was too dangerous to enter. Then, 3 May 1995, just SE

of GME, we encountered a pink-breasted Lesser Gray Shrike, then noticed another, paler on the breast, and a third, long-tailed, very white-appearing shrike flew over them and us. We pursued the last shrike, which proved elusive, flying far and stopping in tall bush tops, watching our approach. It had a mask breaking up at the lores (blotchy lores), and not reaching the bill, its tail showed much white, the back was paler gray than in Lesser Gray Shrikes, the rump was gray-white, the white supercilium very narrow, and the wing showed moderate white in the secondary tips. A dull Lesser Gray Shrike, likely F, perched within 25 m of the big shrike at one point, allowing comparison of wing length (Lesser longer-winged) in profile views. Finally, a masked, large shrike with a very pale gray crown, white at the supercilium and forehead and displaying broadly white outer tail and tips was flushed from a perch N of Center 10 April 1998. It flew E into dense bushland (with some open spaces) harboring game.

Accepting that both races above could be involved in these records, which is more likely? Only the 3 May shrike showed a *pallidirostris* pattern of the lores, and none exhibited obvious pink color on the underparts. All but the 3 May shrike could have represented *leucopygos* from Ethiopia or Sudan; breeding in Sudan is in February–May, and September–October (Nikolaus 1987), so post-breeding, long-distance wanderers could account for our shrikes, even including that of 3 May as a first-year individual. Two problems with *pallidirostris* as the source are: that this race usually returns to Asian in March–April, so early April and certainly early May are late for it; and that possibly confusing first-year *pallidirostris* would be in adult (fresh) plumage by April–May. The shrikes seen were unlike adult Lesser Gray Shrikes in: proportions of wing, tail, bill, body length (*L. meridionalis* is up to 20% longer-bodied than is *L. minor*, Fry *et al.* 2000) and build; lack of black on the forehead; lack of pink below; presence of a white scapular patch; and presence of a white supercilium line. Features observed in these shrikes were unlike those of other tropical African shrikes of this genus. Both authors have field experience with *Lanius excubitor* and *L. meridionalis*, hence our quick reaction to the "gestalt" of three shrikes in as a form of "Great Gray." Nonetheless, without specimens we are hesitant to list these as definitely representing one or the other race of Southern Gray Shrike. We call attention to the boreal (winter and?) spring presence of large, masked shrikes casually in central Kenya.

PRIONOPIDAE Helmetshrikes

White-rumped Helmetshrike / Shrike *Eurocephalus rueppelli*

Months. Throughout the area, except SW corner, resident.

Ecology. Prefers open woodland and riverine woods, including degraded woods, but also occurs in wooded and bushed grassland, bushland, pastures and gardens. Found mainly below 1400–1500 m, according to most references (e.g., Lewis & Pomeroy 1989), we found it common at 1550–2000 m, and occasionally to 2180 m, and mapped by Lewis & Pomeroy (*op. cit.*) all across the Laikipia Plateau. Stevenson & Fanshawe (2001) mentioned its occurrence to 2300 m. The White-rumped Helmetshrike visited bushland at GMF only May–September, usually the wetter (big rains, July–August rains) time of the year. Occurs in more open habitats than White Helmetshrike, and less often than that species in denser woods, but overlaps broadly, often associating with it in a mixed-species foraging flock. Less frequently joins woodhoopoes, and to a lesser extent starlings, drongos, babblers, orioles and others in such foraging flocks. More often drops on prey (from perches 1–8 m up) on the ground than does White Helmetshrike; hawks adroitly in flight and from a perch. Frequently uses available lion-kills, to which diverse insects are attracted, may spend hours hawking insects about them. When bushes and trees are available, uses large mammals, Crowned Hornbills, and Crowned Lapwings moving on the ground as “beaters” to flush insects. Uses termite mounds as hawking and dropping perches. With certain large locusts and other insects, carries the item in a foot, clamps it to a branch and tears it apart and eats it (this was seen only four times in 14 years). Except when nesting, covers a large area, up to 2 km out from a center. Roosts in large acacia or croton trees, usually one or two per tree. They become vocal pre-dawn (c. 05:50 h), and depart the roost mainly 06:10–06:20 h. Highly social, very rarely in pairs, it usually is in groups of three to 12 (mean 5.5); the social group moves as a loose entity, some straggling at the rear and foraging aerially to c. 70 m off to the sides of the group. It is very graceful aerially, flying on V-uplifted wings, gliding and swooping about and over vegetation, easily appearing and disappearing in a min when not foraging intensively in one location.

Movements. Likely moves locally in dispersing and in wandering about open areas post-breeding. Group

numbers tended to be smaller, three to six or so, with larger groups rare after 1990–1991.

Behavior. Sweeping airy flight like other helmetshrikes. Lefranc & Worfolk (1997) likened its hunting methods to those of *Lanius* shrikes, but this is an active, aerial bird, rarely hunting to the ground from one perch for a period of time, but moving readily, hawking insects as it flies, perching briefly, then moving on. Its behavior to us bears no similarity to that of social *Lanius* (*excubitoroides*, *cabanisi*); unlike the latter they do not cluster and call, babbler-like, but approach one another in ones or twos occasionally. Its flight is unlike that of *Lanius* spp.; it swoops, glides and circles, even to prey on the ground. Does not twirl its tail as do social species of *Lanius*. Displaying White-rumped Helmetshrikes lift the tail and lower it, possibly paired birds may touch bills in the air (transferring food?), and one may swirl around another on a perch, dipping then spreading wings as it circles the other bird. One adult broke up three large red-and-black caterpillars and fed them piece-by-piece to another adult. An apparent pair glided together, matching each other's flight, bill-snapping and floating together until past us. Reaction to playback of the voice of the S White-crowned Helmetshrike *E. anguitemens* was strong: White-rumped Helmetshrikes reversed direction in the air and came to playback, underwent search behavior and called. Playback of the southern form's voice in MK caused two adults to approach, one fluttered to a perch beside the first, flitting, with spread wings; it then bowed its head four times to the first helmetshrike. Sometimes two or three huddle together, facing one another, bowing and calling softly.

Mobs and chases would-be predators such as Gabar Goshawks and African Hawk-eagles, as well as Crowned Hornbills at times. It engages in tit-for-tat chases with other aerial foragers or hawkers. Its behavior is generally similar to that of helmetshrikes, as Steyn (1996) noted for the S White-crowned Helmetshrike.

Voice. Closely resembles that of possibly conspecific White-crowned (Fry *et al.* 2000, Harris & Franklin 2000), and reacts (see Behavior above) to its voice. Its own voice perhaps less high and piping than that of the S helmetshrike. There is often a questioning tone to their calls, a “keet-keet?,” “weet-pweet?,” or “pee-twee-tweit?” Melodic and whistled notes are mixed with mechanical “yik-yik-yek, yek-yeek” calls, as several of a group respond to one another, but the birds do not cluster or come together closely. Most

phrases are of two to five notes. Some examples are: "keet, keet, keet-kweet, keet-kweet," "pee-pee, pee-pee-wee, pee-pee-w," and "tyi-tewk, tyi-tyi-tewk." Many of these are loud and carry far, being a dominant feature of its habitats. At times voice has the piercing quality of parrot calls. Soft "eee" and "eee-yeee" notes were heard from possibly paired individuals. A fledgling begged, waving wings and snapping its bill, calling loudly: "pyipe-pyipe." No song is known as such. It vocally resembles other helmet-shrikes; has no buzzy or harsh strident sounds, no song, no duet, unlike laniid shrikes (see Lefranc & Worfolk 1997, Fry *et al.* 2000, Harris & Franklin 2000).

Breeding. Reported to breed February–April, June–August, and October–November (Lefranc & Worfolk 1997, Fry *et al.* 2000, Harris & Franklin 2000), and to be double-brooded. We found three nests active April–June, fledglings June–September and once in January, subadults August–December, and molt June–January, thus indicating breeding April–July, and occasionally in November–December. We doubt that it is double-brooded in our area. Nests were at 3.5 m in an *Olea europaea*, and 10 and 18 m in *Acacia xanthophloea*, all in very open (edge) woods near water-courses. Each involved five to seven adults. Nests were upright atop branches toward their tip; the acacias held nests on a down-drooping branches attached to one side branchlet. All were gray-white, heavily bound with spider webbing on the outside. One collected was 11.4 cm across, of fine fibers, tiny twiglets, grasses, moss and lichens well-bound with spider webbing. One twiglet that had broken through the side had been bound back into the nest with webs, and thus repaired. The nest contained many biting mites. At least three young fledged from this nest between 31 May and 2 June 1992. The other two nests were similar, whitish, upright small structures essentially like that of other helmetshrikes (Maclean 1993). The nest described was in LA, the others were at UL, and W of EG, largely invisible to us as tree foliage grew. Both the others were out of reach; changeovers were occurring in the higher nest 7, 9, and 15 May 1995, hence it likely contained eggs or hatching young, and the other nest contained young through late April 1994, as four or five adults carried food to it, as observed from 60 m. Only one or two fledglings or immatures were ever noted, and no group was seen to contain more than two accompanying immatures or subadults. Among 11 recently fledged young, only one had the crown as brown as depicted in Zimmer-

man *et al.* (1996) and Stevenson & Fanshawe (2000); the others had the facial patch restricted above to forehead or even forehead, with black projecting farther backward behind the eye, and below the eye. However, the crown is variable (see Fry *et al.* 2000). All group adults feed the fledglings. Several copulations involved the presumed pair perched together, with allopreening; the apparent M then leaned into and mounted the F, copulating for 30–40 s, in each of three cases during July. Seen once in November, without allopreening, and copulation took place for only 10 s, perhaps as part of pair maintenance. In each case the two birds involved were apart from their social group. The post-juvinal molt of young birds happens over three to five months, although the annual molt of adults appears to be drawn out, usually ending in September–December.

Specimen data: Twelve were netted November–January (six, including one just coming into adult plumage, taken from one group 17–18 November 1985), and otherwise we netted a June adult, and an immature and two adults in September. Most were in molt and not measurable. Weights of 14 adults were 49.5–67.5 g (56.8 g), and two subadults were 51 and 56 g; these are heavier than weights in Fry *et al.* (2000) and Harris & Franklin (2000). Only four November adults were deemed measurable; they had wings 117–128 mm (122 mm), probably not all primaries were fully grown. The bill of this helmetshrike is extremely difficult to open, the most difficult of passerines handled. Adults vary somewhat in plumage colors, but most have black extending vertically from the side of the neck, approaching a "collar" pointing at the ventral neck. The sides are variably warmly tan, and the upperparts are two-toned, dark on wings, nape and tail, and paler brown or gray-brown on the back (latter tending more toward *S. E. anguitemens* than shown in books above). Soft-part colors: Apparently variable in mouth color, yellow-orange in the younger of the two subadults, more yellow in the other. Three adults had the mouth black above and below, with pinkish about the center above, whereas two in adult plumage (possibly first-year birds) had the mouth gold-yellow with pink on the palate and a black spot either side of the midline, the spots larger in the heavier adult. The eyes are nearly black, and orbital skin is gray-blue. These birds likely remove plastic bands, as banded birds were noted only up to 34 months after banding. Birds banded in the MK-LA sites were seen in their groups in EG, 1.5 km away (two groups occurred at EG), and vice versa.

White Helmetshrike *Prionops plumatus*

Months. Numbers vary but generally common resident in riverine and other woodlands.

Ecology. Relatively common but less so than White-rumped Helmetshrike, favoring more wooded sites, covering less distance per flight, and less often foraging on the ground. It occurs in social groups that are more tightly bound, foraging more closely together. It favors riverine woodlands, and other woodlands, both dense and open (grazed); not in forest at Nglesha, and very uncommonly in bushland (only twice heard at GME, for example), and uses *Combretum* grassland only where fringed with woodland. Rarely occurs about the inhabited centers. Mainly is about the Mukutan and its drainage, centering on MK, LA, EG, and SI, and also the closed woods at PO (Fig. 16). It is less frequent recently; formerly regular at LU, MB and the Lugga Maji Nyoka sites, plus PK and TA. Groups also are diminishing, averaging 7.96 per group through 1990, and 5.35 per group since 1991. Groups forage within a circle *c.* 1 km in diameter. They feed by: drop-gleaning, plucking insects from foliage as they fly downward; gleaning, hovering in front of leaf clusters; and hawking from a perch, or pursuing insects in glides and rapid flight. They also drop to the ground on prey, although less frequently than White-rumped Helmetshrikes. Rarely they hop on the ground, under cover, securing prey; ground-feeding is much less frequent than in southern Africa (Fry *et al.* 2000). Often forages in association with White-rumped Helmetshrikes; also may forage with wood-hoopoes, Brown Babblers, and, less often, with Black Cuckooshrikes, and others. Forages at 0.5–10 m, or higher, but usually below 5 m, taking diverse insects, larvae, and spiders (for foods see Fry *et al.* 2000). Mobs owls (Verreaux's Eagle-owl, Pearl-spotted Owlet). It usually occurs below 1600 m, but Britton (1980) and Lewis & Pomeroy (1989) gave 1800 m as the usual upper limit, and Stevenson & Fanshawe (2001) noted it to 2200 m; we found it regularly between 1700 and 2000 m throughout the study area, except the SW corner. It extends onto the Laikipia Plateau from the W; Lewis & Pomeroy (1989) showed it more or less across the plateau, but it is not reported for Mutara Ranch (Olson *et al.*, undated MS) and Pinguone Ranch (Schulz & Powys 1998) to the E although casually found about Nanyuki (pers. obs.).

Movements. Local mainly, including dispersal; the study area is a likely source of wandering White Helmetshrikes at Lake Baringo (Stevenson 1980).

Behavior. Choruses often were confused with unmarked helmetshrikes. When calling in groups we noted no clear positioning of the birds; Harris & Franklin (2000) found that the dominant F usually perched above the others, and initiated calling in chorus. We often saw three or two birds at the highest position, and choruses were initiated by an incoming outlier bird that rejoined the core group. We saw apparent "pairs" in May, close together, swinging wings up and down, and bowing – but others of the group called at the same time as the pair, so "duetting" was unclear (Fry *et al.* 2000, Harris & Franklin 2000). We saw interactions of groups only at MK and EG. Individuals of each group half-flew at members of the other group, the noise of both groups calling was loud, and the affairs quickly settled by one group bolting away *en masse*. At EG 26 November 1994 we found two helmetshrikes fighting furiously on the ground (the group was nearby, but not calling); one apparently flew away in retreat, but was chased closely and knocked to the ground, where they grappled, the attacker usually on top. There were four of these conflicts in a row, over 15 min. The defeated helmetshrike was left gaping, minus most nape feathers, and weak, able to fly only to a bush nearby. Presumably this was a dominance conflict within the group (Harris & Franklin 2000). Interactions with other species, including chases, ensued infrequently. One adult particularly chased a Levaillant's Cuckoo, not known to parasitize this helmetshrike. Groups with juveniles or immatures seemed to have their activities and direction of movement sometimes dictated by the youngsters, which were usually the center of attention. When there were two young, each seemed to be surrounded by part of the group; if a young bird begged, the surrounding adults waved their wings, called, and rushed to feed it. When the youngsters moved, the adults followed. Unfortunately we usually were unable to follow passing groups of White Helmetshrikes.

Voice. Vocalizations are complex, but diagnostic; one could note their progress in approaching, and leaving a site, hearing them (to *c.* 300 m) coming and going. We detail vocalizations because of suggestions (Zimmerman *et al.* 1996) that races of this helmetshrike differ vocally, and the race in our area, *P. p. cristata*, is poorly known. The commonest call heard at a distance is a "tchee-a-roo, tchee-a-roo," or "chew-a-wew" or "wew-a-wowp," or "chee-chee-chee, pee-a-woo, pee-ee-yow" (plus bill snaps and flight calls, see Harris & Franklin 2000). Sometimes this is more buzzy,

a “dzzzee-ewp” or “dzzzee-owp.” These are perfectly recognizable as the “cherow,” “kerero” and “cheroop” base-note of this species generally (Harris & Franklin 2000: 342); those authors also discussed buzzer versions. Several birds call at once. Also sounds like “dif-i-cult, dif-cult” and “zreet-eet-eet-eeta-low.” An adult in the hand snaps its bill rapidly; when released calls “pee-yow, pee-yow,” which brings the group back to it. There are many other notes and versions, particularly short to long “zheep” to “zheewp” or “zheer” notes. Alarm seems to involve “zheee-zheee” notes (see Harris & Franklin *loc. cit.* and Fry *et al.* 2000). Young beg with loud, buzzy calls as Harris & Franklin (2000: 343) described. In aggression bill snaps may be given in rapid, long series. We were unable to recognize “songs” as such, as rarely were two individuals apart from “noise” of the group. There are other sounds, particularly soft notes. We think the “songs” of Zimmerman *et al.* (1996: 606), suggested as different in *P. p. cristatus* are variant calls of those we have described above (see Harris & Franklin 2000 for the diversity of vocalizations), and not particularly different from sounds of other races. We tape-recorded a wide range of its repertory.

Breeding. Nesting of the helmetshrikes occurred away from our net lanes at the sites; certainly our activities were “well known” to the White Helmetshrikes. Only one nest was located at OD 7 July 1991. Courtship behavior and the presence of cloacal protuberances, and brood patches were noted only April–June. Immatures (one to four per group) fed by adults of groups observed February, April–August and December; immatures feeding with group, but not begging, and subadults, nearly in adult plumage, were seen February–March, May (once), and August–December. Breeding thus is mainly March- or April–August, during the big rains through the July–August rains, and occasionally November–January, following the little rains (given for our region by Brown & Britton 1980 and Fry *et al.* 2000 as February and August, and for Kenya by Harris & Franklin 2000 as February–March, June, August, and October–November, but their dates do not take into account local rain seasonality). Stevenson’s (1980) September–May visitors to Lake Baringo in 1979–1980 could have been post-breeding wanderers from our study area, up the Mukutan River from Lake Baringo. The nest was in a completely shaded area with sparse ground cover at 3 m atop a horizontal dead branch of a live olive. It was white, and bound with spider webbing; eggs were being incubated by a quietly sitting adult. Sometimes

the sitting bird left as the incoming bird landed 1 m or so away; once the bird sat until the incomer came close. In this case the sitting bird seemed to turn the eggs – the incomer called “konk-konk,” causing the bird in the nest to leave, and changeover occurred. We worried that the nest was low enough to be potentially at risk from elephants commonly using these woods. By 19 July the nest was shredded and strewn on the ground, whether by a predator or by elephants was unclear. Hence, we saw no nestlings. We could not separate juvenal and immature plumages as Harris & Franklin (2000) tried to do, but only one immature plumage, in which young were undergoing change. We discuss plumages below, but note that, of over three dozen immatures seen and 12 netted, all showed an “eye wattle” (orbital wattle), smaller and darker than that of adults (Fig. 20), *contra* Maclean (1993), Zimmerman *et al.* (1996), Fry *et al.* (2000), Harris & Franklin (2000), and Stevenson & Fanshawe (2001). Each immature with a dark eye wattle begged for food, and was a center of attention among members of its group. Groups with such immatures moved more slowly and at a lower height than they did later, when the young were independently feeding and flying well. We saw no wandering apparently unisexual groups (Harris & Franklin 2000).

Specimen data. We netted 26 adults, four subadults, and eight immatures, only two of which were ever re-trapped (8 and 11 months after banding), as far as we could tell. The immatures were nearly uncrested, and the subadults had partly developed crests. Adults had long, forward-curving crests typical of *P. p. cristatus* (Fig. 20, Fry *et al.* 2000, Harris & Franklin 2000). The adults ($n = 25$) weighed 39–48 g (44.1 g), including three sexable FF at 44.5–46.75 g and two MM at 44 and 47.5 g. Only seven could be measured for wing length, at 113.5–118.5 mm (116.1 mm). The four subadults weighed 41–46 g, and the eight immatures were 32.5–43.5 g (39.7 g), including three (of four) of one brood netted at the same time, weighing 32.5, 39.5, and 41.5 g. Measurements and weights fit closely those of the large form *cristatus* (Fig. 20, see also Fry *et al.* 2000), with which these helmetshrikes agreed in their long crests and virtual absence of white (some slight primary edge and secondary tip white) in the wings. Laikipia White Helmetshrikes clearly are not of the smaller, shorter-crested *vinaceigularis*, as stated by Zimmerman *et al.* (1996). The immatures varied in amount of buff-white tipping of the tertials and greater primary coverts; some had lesser wing coverts narrowly tipped white. Their heads



FIG. 20. Adult White Helmetshrike netted 1 November 1985 at the Mukutan site (MK). The large, forward-tilted crest, slight white in the primaries and size (see text) are features of *P. p. cristata*. Note the broad (orange-yellow) orbital wattle and the pale eye, which is bluish-tinged white, not yellow (see text). Social groups of this helmetshrike inhabit riverine woodland and tall olive-croton woodland.

varied: some looked pure white (shadowy hint of dusky to buff); others were dusky from ear coverts to nape. The plumage is fluffy and soft in adults, as in White-rumped Helmetshrikes, and immatures are more lax-plumaged than are adults. Molt took much of the year and probably varies with the status of individuals in a group. Helmetshrikes were starting molt in March–May (one was completing molt in April, however). Adults in mid-molt dated July–November, with one in December. Adults ending the annual molt were noted July–December. Soft-part colors: The bill is black in adults, dull black or brownish black in immatures. Young birds have a yellow gape wattle that extends onto the bases of the bill tomlia, present on the tomial bases in all immatures and two subadults. The mouth lining of adults varied from yellow or pink and yellow to blotchy or stringy (nearly striped) black and yellow; the tongue of some adults was yellow with a black band or forward-pointing black V. The mouth was yellow to gold-yellow in immatures and subadults. The orbital wattle was present in all individuals. It

was relatively broad, with longer papillae or a wider base dorsally than ventrally. The wattle varied from lemon to cadmium yellow, gold-yellow, yellow-orange, and yellow with orange papillae tips in adults. Immatures had a distinct if small olive-gray to gray orbital wattle. The eye was yellow in none of the White Helmetshrikes that we observed or netted, contrary to virtually every reference book consulted! Most adults had white-blue to blue-white (Fig. 20, “china blue” we called these) eyes; in others the eyes were pale blue, gray-white, bluish white-gray, dusky gray, pale gray, greenish white and brownish blue (are blue-white-gray eyes a feature of *P. p. cristatus*?). Immatures had eyes dull umber, yellow-umber or red-brown. Legs vary from bright orange and pink-orange to pale orange or orange-yellow, with claws horn or yellow-horn in adults. In younger birds the legs and feet are pale orange. Soft-part colors are more variable than generally reported, and the orbital wattle of immatures and eyes of our resident White Helmetshrikes are not as previously described.

MALACONOTIDAE Brubru, bush-shrikes, tchagras, puffbacks, boubous

Brubru *Nilaus afer*

Months. All but February, October; open, often degraded acacia woodland, bushland, locally.

Ecology. Local resident N, NE, and NW parts of the study area, between Luoniek Ranch to the N, TA, and PK in the W, FS, Titus Dam, and Kuti in the E, to just S of Center, near Center South Dam (once). Wanders into degraded nearby sites (Posho Corner, GMF-Center Road, Center South Dam, N of Kuti) from its centers about PK, TA, NP, FS, and Kuti. Occurred at 1800–1955 m. Also seen in September 1968 by Sassoon, the Starts, and Horne, common about lakes Baringo and Bogoria to the W (Stevenson 1980, Hartley 1986), occurs at Mutara Ranch and Pinguone Ranch (Olson *et al.*, undated MS, Schulz & Powys 1998) to the E, and mapped across the Laikipia Plateau by Lewis & Pomeroy (1989). Found in *Acacia gerrardii*, low, open, often degraded woodland and bushland, in roadside bushes, at oasis-like Kuti garden and surrounding degraded acacia bushland, and livestock-degraded acacia bushland around Titus and Northern Plain dams. Forages in acacias, occasionally in other bushes and trees, eating insects and their larvae. Habits well known in southern Africa (Harris & Arnott 1988, Fry *et al.* 2000, Harris & Franklin 2000).

Movements. Wanders locally in degraded bushland and acacia woodland near sites where resident, see above.

Behavior. Well known, see references above.

Voice. Also well known. Territorial song trilled “ppreeeee” heard January–September, see Harris & Franklin (2000: 293) for vocalizations. Forms of “quee-eeek” call were tape-recorded.

Breeding. Just-fledged juvenile, barely able to fly 5–7 m, fed by M and F in *Acacia gerrardii* (low) trees, NP, 27 September 1986. This record indicates nesting in the July–August rains, as well as (Brown & Britton 1980) in the big rains of April–May; perhaps sometimes nests following the little rains of October–November as suggested by January and March singing. In 1986 the big and little rains were poor and the July–August rains unusually heavy. It generally breeds in response to rains (Harris & Franklin 2000).

Specimen data. None netted, but M and F were photographed, along with the juvenile. Adults lack the loreal black mark of some races (Fry *et al.* 2000), and have the side-flank area extensively rufous (M) or tawny (F), projecting forward around the bend of the wings, to the sides of the neck. These seem to represent

N. a. minor, with rufous-tawny sides (Fry *et al.* 2000 stated that *minor* is like race *brubru*, but smaller, whereas their illustration of *N. a. brubru*, which they note as having white lores, shows a black line through the lores; a M *minor* is depicted in Zimmerman *et al.* 1996, Plate 82, which can represent MM of our study area, except that our MM are whiter, less buffy above). The juvenile was quite white above, with buff evident mainly in the wing bar/stripes. Its chin and forethroat were blackish with white tipping, rather like the crown. There was a broad, black line or patch behind the eye, and a fine black line crossed the lores. Its underparts were creamy white with fine blackish barring. It had a yellow gape wattle and showed yellow inside the mouth. The juvenile of this race has not been described in these details (Fry *et al.* 2000; also Harris & Franklin 2000).

Northern Puffback *Dryoscopus gambensis*

Months. Common resident in woodlands.

Ecology. Found throughout (at all sites except NP and FS) in woodlands, riverine woods, bushed woodland along ravines (luggas), thickets and forest edges, occasionally well-developed bushland (five records for GMF), and gardens. Usually in pairs on territories of c. 10 ha of woodland; sometimes three to four adults are seen, as in mixed-species foraging flocks, and of course in family parties after breeding. Foraging more often at middle and low levels, within 3–4 m of the ground, than in the canopy (*contra* Harris & Franklin 2000). Peers at vegetation, feeds mainly by gleaning, but readily hawks insects noted at another branch than that it is using, or in the air. In larger trees tends to zig-zag its way downward, branch to branch. Flycatches for termites. Takes small to large insects, spiders, also preys on small lizards (skinks, *Mabuia* spp.). It occasionally drinks at water baths. It seems to prefer *Croton* spp. and other dense trees and bushes to acacias. One at Center foraged in lower branches of a large eucalyptus tree. Often it is seen with one or two species of birds near it, even following it, and from 3–20% of the time joins mixed-species foraging flocks, especially with orioles, drongos, cuckooshrikes, paradise monarchs, and others. Readily mobs owlets, and snakes; one M boldly attacked a large boomslang, biting its tail and back, and causing it to flee. It is found across the Laikipia Plateau to Nanyuki (Chapin 1954, Lewis & Pomeroy 1989), where it is common; probably the “Black-backed Puffback” reported by Schulz & Powys (1998) for Pinguone Ranch is rather this puffback. These two puffbacks meet near Nanyuki.

Movements. Resident, disperses locally, with some wandering into normally unused bushland when conditions are lush. The wanderers to Lake Baringo reported by Stevenson (1980) may well come from our study area, which supports a population of Northern Puffbacks at least down to 1500 m along the Mukutan River and its gorge.

Behavior. Displays are much as for Black-backed Puffback *D. cubla* (Fry *et al.* 2000, Harris & Franklin 2000); the rump patch of the M is gray-white and shows less than the white "powder puff" of *cubla*, and the Northern may not "puff" the feathers as much as in the former when following a F, although in display the puff is fully erected. The M has noisy flight display, with wing flipping and bill snapping (latter not noted by Harris & Franklin 2000), and may follow the F about with his tail cocked, bowing, and rump feathers erected; or the F may follow the displaying M. At MK 12 February 1987 three MM with rumps erected chased and fought, two with whiter gray rumps, the other with a grayer, duller rump (young M?). The M that attacked the boomslang (above) flipped its wings and kept its tail well spread in its attack. At EG 13 January 1994 a F carried a twig about in its bill, persistently following a Black-capped Tchagra about. A F-plumaged immature attempting to beg from an adult M at Center 9 June 1990 was repeatedly chased by the M, but kept returning and following it. This puffback occasionally fights with other species.

Voice. The song is a loud series of 1- or 2-syllable notes varying in delivery, both in tempo and volume. The notes may be simple "pew" or "tyew," or longer "tchew," "tcheop," "pyewp" or "tchowp" sounds. Unusually, more double-noted, a "tuk-weeeoh, tuk-weeeo, tuk-weeo," as song. Harris & Franklin (2000) considered the series of mechanical "klik," "tchep" or "chep" notes as the territorial "call," and it may be a second song; however, this also is the main call used by MM in chases and displays with FF, so is distinct from the above song. The first song described above is very like that of the Black-backed Puffback. Most singing is heard April–August, with November–December a minor secondary peak. In display (see above under Behavior) to FF, a M may follow, "puff" erected, tail cocked, calling rather constantly "klik-klik," "tchep-tchep" or "chyip-yip-yip-yip," at times other noisier calls are used, a "ratcheting" series, or softer "ter-twee" calls occur. Alarm notes include harsh, scolding "zhrrrek" or "tchek" notes that may also maintain contact. In flight displays MM give

the mechanical calls as in the M-to-F displays above. We have heard "chink-chink" calls, rather *Passer*-like; Harris & Franklin (2000) reported "sparrow-like" calls as well (we have not heard these from Black-backed Puffbacks). Low "sneeee-eee" calls have been heard. Begging young at least sometimes call "cheet," or "cheep," sounding like song notes of Scarlet-chested Sunbirds. Mechanical wing rustling sounds are incorporated in most displays involving short or longer flights. Bill snapping also accompanies displays. In contrast to reported (Harris & Franklin 2000) trilling of puffbacks in the hand, our Northern Puffbacks mainly gave bill snaps persistently. We present these details because the Northern Puffback, particularly in its E range, is poorly known vocally (see Fry *et al.* 2000, Harris & Franklin 2000). We tape-recorded many of its sounds.

Breeding. The nest is usually high in trees (van Someren 1956 for Black-backed Puffback, Harris & Franklin 2000 give 6.5–23 m above ground for the Northern), and screened by leaves. Fledglings fed by adults (hence within five weeks of fledging, extrapolating from the Black-backed Puffback, Harris & Franklin 2000) were encountered once in April and in June, and mainly (*c.* 15 cases of one or two such young) July–September. Immatures were seen October–January, feeding independently, although some were with parents. Displays of MM-FF, with extensive chases, took place mainly April–June and November, and less often July–September and December–February. Adults with a brood patch or cloacal protuberance were handled only in April–May and July. With data on singing, these indicate April–August as the main period of breeding, with breeding occasionally November–February; Brown & Britton (1980) had no breeding reports from our area (or entire region), with its tri-seasonal rains. MF displays were noted above and seen, similar to those described in Fry *et al.* (2000) and Harris & Franklin (2000) for both Black-backed and Northern puffbacks, except for the plumage differences incorporated in the displays (e.g., the gray-white rump and lower back "puff" of the M Northern). No more than two young were encountered, so the clutch size likely is two (see references just cited).

Specimen data. We netted 11 M and 13 F adults, two just fledged young, and five immatures (older juveniles to subadults; we could not make out two juvenal plus an immature plumages of Harris & Franklin 2000, nor apparently could Fry *et al.* 2000, who described only an immature plumage between nestling

and adult Northern Puffbacks), representing all months except March and June. Additionally we sighted several of these, and retrapped six at intervals of a few months to 13 and 18 months, and one netted as a juvenile 5 October 1987 was retrapped 74 months later, 22 December 1993. The 11 MM weighed 30.5–36.5 g (32.57 g); only five could be measured, wings 86–92 mm (89.6 mm). The 13 FF weighed 27–37.5 g (31.1 g), with wings (n = 5) 81–92 mm (87.9 mm). The immatures weighed 28–33.5 g (only four were weighed), and the two recently fledged individuals were at 35 and 45.2 g. These agree well with Kenyan measurements and weights (Fry *et al.* 2000) for *D. g. malzacii*, and suggest that MM are slightly heavier and longer-winged than are FF. Non-molting adults were in February, April–May, August and November–December; adults starting the molt dated February–July, those in mid-molt, April–August, plus one in February and one in December, and the molt was ending in adults from August–January. The variation may reflect breeding in various years, depending upon rainfall. Females are as described for this race in the literature (Fry *et al.* 2000, Harris & Franklin 2000), except that the crown is darker, more dusky gray, less brown than illustrated in the former reference (more nearly as depicted in Zimmerman *et al.* 1996), and the dusky extends ventrally below the eye to the malar, mixing there with the buffy underparts. Immatures are brown-crowned (some have buffy feather tips), darker to the rear, pale over the eyes; otherwise brown above (grayer, even whitish gray on the rump), and paler below than adult FF. The undertail coverts are buff-white. Soft-part colors: The bill is gray-black, even blue-slaty black in MM; in FF it often is paler gray at the base of the mandible, and horn-colored on the tomtia. It is more black-gray in immatures, and juveniles show a yellow gape, and horn tomtia to the tip, which is less hooked than in adults. The mouth lining generally is gray-black to black in adults, paling laterally; the tongue is pink. Immatures have the mouth pinkish to yellow; one young M was pale gray-black in mouth color. Juveniles had yellow mouth linings, without dark spots (Harris & Franklin 2000) in two recently fledged juveniles. They had yellow gape wattles. Adults have narrow orange orbital skin that is gray in juveniles. MM have outer ring of the iris red or red-orange (two were “bright orange”), and inner ring yellow-orange, pale orange or gold, thus yielding the bright orange or red-orange usually noted in references. One F had the eye as “red” as that of a M (outer ring red-orange, inner ring gold), but others

were orange to red-orange in the outer ring and yellow to gold in the inner ring, thus a less “bright” eye. Older immatures have paler orange eyes. Still younger juveniles showed the iris uniformly gray-brown, ochre-gray or brown-gray. The legs and feet varied from gray to blue-gray.

Brown-crowned Tchagra *Tchagra australis*
Months. Relatively common resident.

Ecology. Occurs at all wooded sites, rarely seen in degraded roadside habitats, nor in low and degraded bushland and gardens. Avoids dense woodland, as at PO and NG, where occurring at edges and in thickets. Compared with the Black-crowned Tchagra, it favors more moist areas with denser cover (Lewis & Pomeroy 1989); it is typically the woodland-edge and dense-bushland tchagra, found in streamside or streambed vegetation, with the Black-crowned Tchagra in more open bush on slopes above the streambeds. Where occurring in bushland, as at GMF, it keeps to denser parts and is only 20–50% as common as the Black-crowned. It occurs at all sites, and about some old bomas and dense habitats of some dam walls, but is not seen between sites, whereas the Black-crowned is a common roadside bird all over the study area, in more open sites, occurring in many more situations than does the Brown-crowned (thus, we netted 19 Brown-crowns but only four Black-crowns at our sites, which are around wooded situations). It comes to water frequently (the Black-crowned seems independent of water), and was netted more regularly than was the Black-crowned at GMF because of the water at our camp. The Brown-crowned Tchagra is more often seen in pairs, and probably has a considerably smaller home range than does its ally, and it less often joins mixed-species foraging flocks than does the Black-crowned Tchagra. It feeds in cover on the ground primarily, eating insects and some berries (*Euclea* fruits). In the 5 ha or so about the bandas and tents of GMF camp we had one pair of Brown-crowned Tchagras; only twice did we hear a second M sing far to the SW, toward the Mukutan River. In contrast, the Black-crowned Tchagra territories of three pairs extended out from camp, and occasionally four or even five MM could be heard singing.

Movements. Resident, only local dispersal.

Behavior. We can add little to the behavior described by Fry *et al.* (2000) and Harris & Franklin (2000). Flicks wings in aggression, as at a human intruder. Sings on a branch flipping and flailing wings and bouncing on its legs (in our area sings as often from

a perch as in flight.). Undescribed is a display of the M toward the F; the M spread its breast feathers to the sides, flattened laterally (pancake-like, rounded in appearance to the front), appearing fluffy white to the sides, and holding its head very high above it.

Voice. Songs are harsher, less melodic than those of the Black-crowned, in series of double, to single notes, a "tcher-aa," becoming "tcher-ee," ending either in a "tee" or "too" note, or a "cher-roo," dropping in pitch and finally in volume toward the end (Fry *et al.* 2000). Often given in flight, accompanied by wing sounds somewhat like the drumming of a woodpecker. It is usually not a very early or late-in-the-day singer (songs mainly 06:30 to 18:20 h, rarely 06:10–18:46 h). Songs have been heard in every month, but predominantly May–July, with lesser singing in April and August–September, and in some years a small peak (less than half the May–July rate, but more than in April and August–September) November–December, after the little rains. It sometimes responds to songs of the Black-crowned Tchagra, and vice versa; territories of the two species overlap, but likely not the centers of their territories. Also has many calls (Harris & Franklin 2000), including ratchety "tchik-tchuk" calls, single "tchuk" to "tcheerk" notes, an interactive trill resembling the trilled song of the Brown-backed Honeyguide, "chip" and "chip-i-i-i-i-i" calls.

Breeding. We found but one nest, in May. Courtship and other displays were prominent in April–August, and November–December, two MM with a cloacal protuberance were netted in June; just-fledged juveniles were seen in September, and an adult carrying food was noted in that month. A subadult in January, and the observation of an adult carrying nesting material in February attest to breeding other than in the main April–September period. The singing periods of May–July and November–December are in accord with breeding at those times. The annual molt starts in June–July and ends October–January, generally, although one adult in mid-molt in April may reflect end-of-the-year breeding. Brown & Britton (1980) were interpreted by Fry *et al.* (2000) as noting breeding December–October, but data of the former suggest February–July for our region ("D"), although unlikely to reflect our triple-rains subregion. So breeding seems to occur during the big rains and into or through the July–August rains, and sometimes following the little rains. The nest was in an olive tree at the edge of a glade at OD, 2 m above ground, constructed as noted by van Someren (1956) and others; it contained two white eggs with purplish streaky

spots about the large end. We do not know the fate of that nest.

Specimen data. We netted 19, one of which had to be let go. One subadult weighed 32.5 g. Of 17 adults weighed, the range was 34.5–41.25 g (mean 38.0 g), and nine that could be measured had wings 72–76 mm (75.4 mm). These fit reasonably well with the inland race *T. a. emini* (Schifter & Cunningham-van Someren 1998, Fry *et al.* 2000), although the wings are a bit short. The subadult was coming into adult plumage. Adults have a white orbital ring above and below the eye (broken by the black of the eye-stripe before and behind the eye), omitted in the Fry *et al.* (2000) illustration, but clearly shown in Zimmerman *et al.* (1996). The alula is sharply black on the inner web and white on the outer web, and stands out as in other tchagras, but shown weakly or only hinted at in most illustrations. Crown feathers are black-based, hence molting birds can appear black-crowned in part, rather than brown-crowned. Soft-part colors: Bill is generally black or brown-black; mandible may be mainly black with a gray-horn base to mainly gray-horn with a black tip. The mouth lining is black in MM, at least, but some fully adult birds, perhaps FF, have a yellow-flesh mouth; that of the subadult was dusky yellow. The eye varies, though paler toward the pupil in all; colors in adults were dark brown, brown, umber-gray and blue-gray. The legs are gray to gray-cream, the toes horn-gray to gray-horn, and the toe pads are pale yellow. Five of the birds netted had two or more ticks on the face, mainly about the lores. Only one individual was retrapped, and that 10 months after it was banded (they may be able to remove plastic bands).

Black-crowned Tchagra *Tchagra senegala*

Months. Common resident.

Ecology. More widespread than its Brown-crowned relative, occurring in more open, drier situations, namely bushed grassland, woodland edges, degraded bushland and woodland, roadsides, old bomas, bushed areas about dams and tanks, and rocky slopes. Neither tchagra lives about gardens in the study area. Past burning and overgrazing have favored this tchagra. It occurs near all our sites, usually in surrounding degraded bushland and slopes. At GMF extends out from road in degraded bushland and bushed grassland to the SW, S, E and NE; at PK, is on degraded bushed slopes and *Combretum* grassland, and Brown-crowned is in denser bushes of the lugga (see Fig. 17). More often in mixed-species foraging flocks than is Brown-crowned, joining diverse babblers, thrushes, warblers,

drongos, larks and pipits, and others. Flycatches upward from ground for termites. It occurs commonly to 2000 m or more in the study area, and is present about Nanyuki (1950 m) and throughout the Laikipia Plateau (Lewis & Pomeroy 1989). Its habits were well covered by Cramp & Perrins (1993), Fry *et al.* (2000) and Harris & Franklin (2000).

Movements. Probably resident, dispersing locally, but likely extends beyond territories into more open and degraded surroundings in wetter periods.

Behavior. Displays, as far as known, were covered by Cramp & Perrins (1993), Fry *et al.* (2000) and Harris & Franklin (2000). These note that in some territorial and courtship displays the tail may be fanned. One June we saw an apparent pair on the road, one displaying to the other and not only fanning the tail before it, but rippling the feathers of the tail, creating a wave-like effect as each rectrix was raised and lowered (at such times the feather growth bars are particularly visible). The displaying, presumed M raised its crest, had the head high, and pranced before its onlooking mate, slowly rippling its tail. This tchagra, perhaps aggressing, has a slow, up-down ("larking") flight when flushed by our slow-moving vehicle.

Voice. Its well known, loud, whistled song, uttered in flight display or from the ground or a low perch, is a common sound of open bushland. The phrases are variable in number of notes and slurring of pitch (Cramp & Perrins 1993, Harris & Franklin 2000), and songs may or may not have F accompaniment. Sometimes shorter songs differ from the usual ones, e.g., a short "swee-too" (or "three-too"), and a "tchwa-wa-wa, zheet-zheet, tchwa-wa-wa, zheet-zheet," that may differ functionally. April–September, and especially May–July, are the peak of singing, and a smaller peak in December–January approaches the singing levels of April and September, but is only *c.* 40% of the May–July levels (sustained singing in December–January, is, however, but 15–20% of the May–July levels). This aside, the Black-crowned sings more consistently throughout the year than does the Brown-crowned. There is much variation year-to-year, likely to do with rainfall. Thus, in wet 1997 singing was prevalent all year and although very high levels of singing marked May–June in most years, after low-rain-fall 1993 even marked big rains (April–May) of 1994 failed to elicit singing at GMF on more than 10% of the May–June days, vs 80–100% in most years. This tchagra also sings earlier and later than the Brown-crowned when breeding, starting at 05:48 to 06:15 h, and ceasing at 18:40–19:00 h (at other seasons from

06:10–07:00 h starting, and ending at 17:30–18:40 h). It has diverse other calls (see Cramp & Perrins 1993), many mechanical or growling-like in sound ("ratchety," "rasping growls"), and its wings make several display sounds, from fluttery to snapping.

Breeding. Not a bird encountered often within our sites, although its ringing voice could be heard from them. As indicated by preponderance of singing May–July, this period marked the height of breeding (three nests in June, displays most frequent then, three instances of carrying of food in July, and two fledglings seen in July). MM netted February and July had a cloacal protuberance. Molt data, though meager, indicated June–September molt, with fresh-plumaged, non-molting birds November–April. Nests were 0.4 to 1.5 m in bushes or young (*Combretum molle*) trees, and contained two or three eggs or young. Eggs were white with brown-purple marks at the large end. Two newly hatched young in one nest were naked, gray-flesh in color, with eyes yet closed and gape yellow. Nests were fine fiber cups with twiglets and coarse fibers woven about (see Harris & Franklin 2000 and Plate 125 in Tarboton 2001). Because of risks of predation we did not approach nests closely; the one with three nestlings suffered Gray-headed Bush-shrike predation. Brown & Britton (1980) had a preponderance of breeding in our region during March–April, with some breeding in all months; our subregion, with three rainy seasons, shows breeding in the big rains (April–May, rather than March–April here), and beyond to the more regular (if less in amount) July–August rains. In some years breeding may occur November–February, or even in other months.

Specimen data. As noted above, we were not netting in its habitat, so were lucky to net four adults, one of which escaped before we could weigh and measure it. Two adult MM (cloacal protuberance) weighed 51.25 and 51.5 g; an unsexed adult weighed 46.75 g. The 2 MM had wings at 84.75 and 86 mm. These are assigned to *T. s. armena* (Fry *et al.* 2000). Two of the three had ticks present about the face. All had the superciliary stripe white anteriorly, grading to chestnut at its rear (more colorful than usually illustrated). All had a fully buff-white to white, distinct upper and lower orbital ring of feathers, broken by the black eye-stripe. The two MM had a black mouth lining; one had eyes dark brown, the other's eyes were gray-blue (hence eye-color may not only differ sexually but also individually, see Zimmerman *et al.* 1996). Other colors are those reported by Fry *et al.* (2000) and Harris & Franklin (2000).

Rosy-patched Bush-shrike/Shrike *Rhodophoneus cruentus*

Months. February, August, September; casual visitor.
Notes. Observed in the study area 3 September 1968 by Sassoon, J. and A. Start and Horne, and reported casually along the E border of Ol'ari Nyiro Ranch by C. Francombe. We encountered, and for 10 min watched, a M, a F and an immature (no black or pink markings) of *R. c. hilgerti* along a road N of NP site, en route to the N border 24 August 1997. These took insects along the bare road and surrounding, rocky, degraded bushed woodland. They kept near cover, at times reminding us of Rufous Chatterers in their haste to get near a bush or under a tree, although the M foraged for several min at the open roadside. On 9 February 1999 we came upon an apparently lone, adult M Rosy-patched Bush-shrike of the same race (the races are distinctive, Harris & Franklin 2000), along the GMF-Center road N of Center. It foraged on the roadside, then flew into a leleshwa bush, where it secured two insects. Although Lewis & Pomeroy (1989) noted it occurring mainly below 1300 m, but sometimes up to 1600 m, they mapped it across the Laikipia Plateau to our E (*op. cit.*, p. 448), and it is reported on Pinguone Ranch (1650–1850 m) by Schulz & Powys (1998), so it is not unlikely in the study area. We saw it at c. 1880 m and at 1920 m, and it likely reaches 2000 m along the E border. It is a casual visitor from the E and NE.

Slaty/Slate-colored Boubou *Laniarius funebris*

Months. Common resident.

Ecology. Occurs throughout the study area, in all habitats having dense bushes, bush piles, and cover close by; at edges of pastures and airstrips where bushes are plentiful, in woodland edges, throughout bushland (except where very degraded, with extensive bare ground), riverine bushes, thickets, bushy patches in *Combretum* grassland, old bomas, and gardens. Usually avoids situations in which it is more than 1–2 m in the open, except about gardens. Lewis & Pomeroy (1989) gave its elevational level as up to 1500 m and occasionally 2000 m, but Fry *et al.* (2000) put the upper level at 2000 or 2200 m. In the study area it is commonly found to 2050, and even 2100 m (slope of Kuti Hill near crest), and occupies suitable situations everywhere. One was found dead, of no apparent cause, in the center of Nglesha “forest,” the most heavily-wooded situation in the study area; it was not otherwise seen or heard from very wooded (NG, PK, LU, KS) core locations of wooded sites, but was

common about the edges. It flies low and directly, and likely suffers mortality from automobiles driving through bushy areas. Slaty Boubous forage mainly on the ground, probing and pecking under leaves, twigs and detritus, using a push-and-brush-aside mode, working side-to-side in front of them, but not tossing the material, in their search for insects. It often came to our fruit (papaya, mango) rinds, definitely eating the fruit. It also forages in bushes and lower levels of trees, and occasionally flycatches upward from the ground or a low perch, taking termites during emergences. These boubous come to noisy, netted birds, perhaps mostly to mob a “predator” rather than to act as one. Foraged in our wax shed, eating beeswax at least casually, but mainly taking insects beneath the wax, and waxworm larvae; sometimes foraged with honeyguides in the wax. A boubou, with a caterpillar in its bill, attacked and supplanted a foraging African Thrush, then swallowed the caterpillar, and commenced foraging in the area that the thrush had more or less cleared! It occasionally joins mixed-species foraging flocks, usually with ground-foraging species such as babblers, but in large flocks including up to 21 diverse species of mid-story to ground-foraging birds. We have seen Slaty Boubous drink from puddles, but does not attend bird baths, except to forage around them. The species is an aggressive mobber of snakes and mongooses.

Movements. Very sedentary, except for dispersal; forages over larger areas, into surroundings out of the core breeding territory in non-breeding periods.

Behavior. Well-described in relation to pairing and duetting (see discussions and citations in Fry *et al.* 2000 and Harris & Franklin 2000). Has a flight display, apparently not described, the M flying up with loud, fluttery wing sounds, head held high and tail partly erected, over 7–10 m. Courtship was described by van Someren (1956), as well as by Harris & Franklin (2000) and others. It may duet without erecting the black and white feather “puff” of the rump, that may be more evident in the breeding season (duets all year).

Voice. The pioneering work of Thorpe (1972), followed up by Wickler and associates (e.g., Wickler & Seibt 1979, Sonnenschein & Reyer 1984, Wickler & Sonnenschein 1989) addressed the duet of this (and other) boubous. Duets are variable, and uttered by the paired M and F all year, often as a pair-maintenance and contact mechanism. Even when not breeding it sings (M not always answered by F) early (06:10–06:30 h) and late (18:35–18:55 h), presumably to

achieve post- and pre-roosting contact with the mate, which will duet up to 60 m from its partner. Duets are so important that a netted bird may utter its duet song, rather than give alarm notes, when released. Most often the M sings a brief, hollow-noted two to four notes (“ko-ko-wit,” or “wop-oo-wee,” or even “b’dunk’dunk”), and the F replies (with a “chee-wee,” or “ch-weenk”). Other variations are contained in van Someren (1956) and references above. Also, either sex may use a trill, instead of the notes above (we have not heard both sexes trill in one duet). The duets sometimes become simultaneous songs, as when the F repeats her song, triggering another M song to which she may reply as he utters it. Slaty Boubous often increase duetting after rain, and they sometimes duet in immediate response to a duet by the Tropical Boubou, with which it is sympatric in the study area. When breeding, may duet pre-dawn (as early as 05:30 h) and as late as dusk (to 19:01 h). It has many calls, including snarls, grunting snarls, rattles, and clicking sounds. M “tchik” calls in display to F resemble sounds made by a human sucking with the tongue hard against the palate. In hand, makes “bill-snapping” sounds (“tuk,” “pop”), clap-like, that are actually vocalizations – it can make these with the bill held closed. It also utters an alarm “skreek”. The wings make rustling sounds when displaying in flight, and during chases. Occasionally a third adult, a F, may associate with a pair, and take part in a duet with them, in one case giving repeated “that---that” notes (see also Harris & Franklin 2000). Many vocalizations were recorded on tape.

Breeding. We located no nests, but have as breeding indications a preponderance of songs and duets April–September, and to a lesser extent December–January. We observed fledglings in February and July, juveniles in July–August, courtship in April–June and January, adults carrying food in July and feeding dependent young in September, subadults August–September, and adults with a brood patch or cloacal protuberance in January–February, May–June and August. Adults ending the molt dated August–February, with molt starting to mid-way June–August. Slaty Boubous in the study area breed April–August, in the big rains through the July–August rains, and to an extent following the little rains. Brown & Britton (1980), had sparse records from the region (lacking data from our triple-rainfall subregion) in March, May and November (big and little rains, as about bimodal-rainfall Nairobi). See Fry *et al.* (2000) and Harris & Franklin (2000) and for other aspects of breeding.

Specimen data. We netted 27 Slaty Boubous, 10 MM, six FF, three adults of unknown sex (two others were checked only for molt), three subadults and three juveniles. The MM weighed 36.5–46 g (42.1 g), and nine had wings 82–91 mm (86.4 mm). The six FF, included two probably laying, with a well-defined brood patch, at 48 and 49.5 g; the other four FF weighed 37–44.5 g (40.6 g). Wings of five FF were 76.5–84.5 mm (80.8 mm). The three other adults weighed 38–47.25 g, and two had wings 84 and 87 mm. These data are in accord with those in Fry *et al.* (2000), and suggest that the MM are slightly larger than FF. The three subadults weighed 32–42 g, and two juveniles were 39.5 and 40.5 g; a bob-tailed, recently fledged juvenile was 51.75 g, our heaviest bird. MM are more glossy black than the grayer FF, although some FF look black in the field. Juveniles are gray with buff feather edges, especially on the crown, thighs, undertail coverts and wing coverts (especially greater coverts), and sometimes on the back and rump to upper-tail coverts.

Soft-part colors: The bill is black. The mouth lining of adults is black to gray-black, including the tongue; in subadults the mouth is black at the edges and yellow in the center. Juveniles have a pale yellow mouth lining, but in the short-tailed, short-winged fledgling the entire mouth, including the tongue, was pale pink. The narrow orbital ring of bare skin is black. The eyes are dark brown, even brown-black, and juveniles have dark brown eyes. The black legs have yellow-gray pads of the toes in adults, the pads being pinkish in young juveniles. These details add to those by Harris & Franklin (2000).

Tropical Boubou *Laniarius aethiopicus*

Months. Resident in woodlands and thickets.

Ecology. Generally in more wooded situations than the Slaty Boubou, especially along streams, but the two are broadly sympatric in the study area, *contra* Lewis & Pomeroy (1989). From riverine woods and woodlands forages into surrounding bushland and wooded grassland. May breed near water in dense bushland, but does not frequent degraded open woods or bush. As use of fire and overgrazing diminished woodland and increased bushland and open areas, this bush-shrike has decreased in the past 40 years, whereas Slaty Boubous have increased (Horne, pers. obs.). Most of our sites being wooded, Tropical Boubous occurred at all sites but FS and NP; more than one pair were noted at eight sites (TA, UL, MK, KS, SI, NG, PO, and LU), with up to four pairs at NG. It occurred

regularly at dam walls with dense vegetation; visited GMF irregularly, sometimes for 10–15 days, but a pair nested in June–July 1991, and a subadult was present January–February 1992. At GMF it was only present about the well-watered camp center. It forages on the ground, by probing, picking and leaf-raising, in bushes and in the lower parts of trees. Its habits are covered by van Someren (1956), Fry *et al.* (2000) and Harris & Franklin (2000). We saw this boubou eat beeswax at times, both in feeder hives, and at our wax-drying shed at GMF; it also foraged for insects in the wax and under it, and was seen to snap up several honeybees in the hive situations. Bathes occasionally in bird baths. It infrequently joins mixed-species foraging flocks. It mobs predators such as Pearl-spotted Owlets.

Movements. Generally resident; lone subadults and presumed young adults may wander into and through suboptimal habitats.

Behavior. Well known through earlier workers (Chapin 1954, van Someren 1956) and as summarized by Fry *et al.* (2000) and Harris & Franklin (2000). We have seen three adults singing at one another, raising and lowering the head, gaping (black mouths show up well) and fluttering wings in chases. Two apparent MM fought bill-to-bill in a bush, then fell, clutching one another, bouncing on the ground before separating. It is chased, even mobbed, by such birds as Brown Parisomas (drove one boubou out of its nest area). Itself attacks and chases such birds as the Common Fiscal, orioles, and cuckoos.

Voice. Well known through the work of Thorpe (1972) and others (see Fry *et al.* 2000, Harris & Franklin 2000). The synchronized duets take place all year, peaking April–July, with a lower peak December–January; songs apparently not duets also peak April–July, but there is no December–January peak. These mix fluting and harsh songs or elements, such as “bo-bo-breee-oo, bo-bo-breee-ooo, breee-ooo,” the hollow notes of the M and the “breee” from the F. In addition to the diverse duet songs, MM may utter “wa-hooooop” calls, and in aggressing, “poop-oo-oo-ooop.” Netted birds utter a sharp “tik-tik” (see alarm calls of Harris & Franklin 2000). There are many “ratcheting,” snarling, and fluted calls.

Breeding. Although Brown & Britton (1980) called their breeding records from our region “confusing,” the pattern of duetting (see Voice), June–July nests and nest-construction, occurrence of juveniles April–August, cloacal protuberance and brood patch data from May–June, molt starting May–June and ending

through February, and an independent subadult in January, point to breeding during and between the big rains of April–May, and the dependable July–August rains. A nest 4 m up a dense olive tree at GMF 21 July 1991 represented the only nesting attempt at that site (in 12 years). Constructed of fibers and twiglets in a small cup, it contained two nestlings that were fed tiny insects and brooded frequently. The attempt failed in late July, due to an unknown predator. No more than one fledgling was encountered with an adult (April–July).

Specimen data. We netted 14 individuals, an immature coming into adult plumage at GMF 10 January 1992, and 13 adults. We suspect that they readily removed our (plastic) bands, as only one was noted after banding, and that only one month later. The adults weighed 45–56 g (51.9 g), and included two MM at 45 and 56 g, and two FF at 51 and 52 g. The subadult weighed 49.5 g. Because of molt, only five adults could be measured, showing wings 90–95 mm (92.8 mm). One “molting” adult 7 August 1987 actually had an arrested molt, with new primaries 1–4, and new tertials, but no other molt (body, head, tail, wings, otherwise “old”). The boubous represented the race *L. a. ambiguus*, although one adult netted and several observed in the field had one secondary feather with a white outer edge, extending the usual, short wing bar typical of this east-of-the-Rift subspecies (Fry *et al.* 2000). The subadult was molting on the body and head, but a few bars were present on the breast, the crown still showed brown spots on four to five feathers, and the outer rectrices were tipped white. Soft-part colors: The bill and mouth lining were black, and the orbital skin usually so (gray-back in subadult and in one adult). Eye color varied from very dark brown (even black-brown) to chestnut or red-brown; the last had a brown to chestnut outer ring of the irides, and a crimson, narrow inner ring, imparting the reddish tone. The legs were blue-gray to pale gray-olive with creamy scale edges, or a tinge of horn; the toe pads were pale yellow.

Sulphur-breasted Bush-shrike *Malaconotus sulfureopectus*

Months. Local but widespread resident.

Ecology. Found throughout the study area, at all our sites and to 2000 m (more common below 1500 m, Lewis & Pomeroy 1989), favoring woodlands both tall and canopied, and low with well-spaced trees, also thickets, gardens, dense bushes in *Combretum* grassland, and wanders in bushland (four times briefly

at GMF camp). When seen, is usually in bushes and low trees; skulking, and often missed when not singing (see Harris & Franklin 2000). Forages at times in mixed-species foraging flocks with such birds as drongos, bulbuls, orioles, warblers and other bush-shrikes. One reason we miss it frequently is that it covers a large territory (no site held more than a pair). *Movements.* None noted except locally; dispersing immatures and adults wander about bushland and dams.

Behavior. See Fry *et al.* (2000) and Harris & Franklin (2000).

Voice. Sings all year (most frequently April–July and in December); duets, but F harsh song part of duet (Harris & Franklin 2000) is not loud, and likely often missed. Duets were most often heard April–May. Typical whistled song is a series of three to six short notes (“wi-too-too,” “tee-tee-tee,” “wit-wit-wit,” see Chapin 1954 and Maclean 1993), followed, often after a slightly longer pause, by a sometimes higher- or lower-pitched “teet,” “tee,” or “pyea.” It also reverses this at times (“poo – wee-wee-wee”). A loud “wheet-wheet” has been heard, and an immature in hand called “shra-shraa”. The wings rustle in short flights, especially during interactions, and snaps bill aggressively. See also Fry *et al.* (2000). This species sometimes sings in response to songs of the Gray-headed Bush-shrike.

Breeding. An immature (Harris & Franklin 2000: 221–222) already independent was netted 31 August 1993 at GMF, and a juvenile (Harris & Franklin, *loc. cit.*) with parents nearby was netted 3 December 1988 at MK. Additionally, we saw an adult carrying food 3 June, and a juvenile being fed by an adult 4 August. With April–May the height of duetting, and songs peaking April–July and December, breeding is indicated April–August, in the big rains through the July–August rains, and following the little rains in November–December. Stevenson (1980) reported breeding of this bush-shrike in April–June at Lake Baringo, which is in the uniseasonal (April–October) rainy-season regime (Region A of Brown & Britton 1980), as opposed to the tri-seasonal rainfall in the study area. The juvenile was in the plumage described by Fry *et al.* (2000) and Harris & Franklin (2000). The immature was pale-gray on the top of the head and ear coverts, yellow-gray on the forehead, dark gray on the area in front of the eyes, with a yellow-white anterior superciliary and a white ring of orbital feathers around the orange-brown eye. Its breast, sides and underwing coverts were orange, the throat yellow with some white. The wing coverts, tertials and secondaries were tipped

yellow-white. Its rump was vaguely barred dusky. There were three long, white feather filaments projecting from its hindcrown.

Specimen data. We netted but six, the juvenile noted above at 26.25 g, the immature at 29 g in weight (wing length 84.5 mm), and four adults weighing 25–30 g (27 g). Three of the adults had wings 86–89 mm. These represent *M. s. similis* (Fry *et al.* 2000); all were very orange below, with pale facial areas orange-yellow or gold that extended over the anterior forehead across the base of the maxilla. The forehead was gold-gray to the rear. All adults, and the immature, were more orange below (and not limited to a band on the breast), than illustrated in Zimmerman *et al.* (1996), and Fry *et al.* (2000), whose MM of this race are much too yellow for our birds of either sex. The young birds had the bill dull black with horn at the base of both maxilla and mandible, and the bill hook was horn-colored. Eyes of adults are more dark brown, less orange-brown or red-brown than in the young birds (see Fry *et al.* 2000, Harris & Franklin 2000).

Gray-headed Bush-shrike *Malaconotus blanchoti*

Months. Rather common resident throughout the area. *Ecology.* Occupies all woodlands (avoids acacia woodlands when trees are leafless), thickets, dense bushland (except for nearly uniform lelehsa bushland), gardens, and the edges of densely wooded parts of NG, PO, LU, and SI. Occurs to 2100 m; Lewis & Pomeroy (1989) reported it up to 1600 m, except for W Kenya, where it reaches 3000 m, but it commonly reaches 2000 m in the study area, and about our Nanyuki residence. Often missed when not vocal, partly because it skulks inconspicuously, but also due to its huge territories (50–200 ha per pair, Harrison *et al.* 1997). More often heard than seen. Our birds forage, usually alone or in pairs, from the ground to the canopy (Fry *et al.* 2000), although it does not often forage in the canopy of tall trees. Its foods and feeding are well known (Maclean 1993, Fry *et al.* 2000, Harris & Franklin 2000). One bashed a large beetle against the ground repeatedly, and ate all but the head and wings. A strong predator of nestling and fledgling birds and eggs, one ate eggs of a pair of Laughing Doves, another hunted down and killed all three newly fledged Black-crowned Tchagras, has been seen carrying a small bird in its bill, and cleared two nests of African Paradise Monarchs of young. We failed to save a F Scaly-throated Honeyguide, caught in the bottom of a net 1 m above ground; a Gray-headed Bush-shrike hopped up at it, bounding, and seized the honeyguide

by the nape, crushing its skull with the powerful bill, before we could drive it off. It did not bathe, but came to our bird baths, hunting over them, forcing us to drive them away lest they prey on small, drinking or bathing birds. Occasionally joins mixed-species foraging flocks of drongos, orioles, and other larger species, and once accompanied birds foraging over a moving party of dwarf mongooses.

Movements. None noted, subadults and perhaps young adults without a territory may wander into areas such as open NP site, and into bushed or wooded grassland where not usually found.

Behavior. Well known (Fry *et al.* 2000, Harris & Franklin 2000). In display during duetting M not only bows with each call, but pumps head up and down. Its presence is often noted by alarm and mobbing calls of small birds, whose behavior it affects – one moving into the tree in which a Scaly-throated Honeyguide was singing caused the latter to cease; it watched the bush-shrike, and only resumed singing when the bush-shrike left. Near a paradise monarch nest was repeatedly mobbed by the occupant, bulbuls, drongos, and an African Golden Oriole; the bush-shrike called and snapped its bill, and was driven away again and again, but persisted and eventually devoured the young monarchs.

Voice. Song and duet well known (sonograms in Sonnenschein & Reyner 1984 and Maclean 1993). These occur all year, but are three to nine times more frequent April–September, and December–January than in the other months. May and July were the peak months for songs and duets overall, with April, June, August, and September levels still above those of December and January (only occasionally sings often in December–January, as in 1996–97). During years with heavier-than-usual rains in all three seasons, sings much of the year, but usually singing and duetting diminish after July. The song is a hollow, slightly nasal, *c.* 0.3-sec “waaaaak,” in series, sometimes sounding double (“waaa-awk”), and is readily mimicked by a human whistling. The harsh F song notes (Harris & Franklin 2000) are less loud, thus missed as inaudible at a distance. Sometimes goes into a combination of the above note plus a grating scream, a “shreeek.” Also snaps bill or rattles in sequence of double notes, with a melodic “wew” or “ew” (“bdddt-ew, bdddt-ew, bdddt, bdddt-ew,” with “ew” sometimes left out), especially in response to mimicked song or playback. It also claps and flicks its wings “tdak” to playback by a recordisc. Bill snapped (“tlch”) and called “nyeow-nyeow” at birds mobbing it. Has

many other sounds (Fry *et al.* 2000, Harris & Franklin 2000), including grating and snarling notes. During interactions loudly flicks its wings as it flies about. One hoarse-voiced M sang, *sotto voce*, April–May 1996 at GME.

Breeding. Juveniles were observed in July, August, and December, and an immature coming into adult plumage was noted in May. These, with song and duet information (April–September, December–January, peak May–July overall), indicate breeding especially through the big rains and July–August rains, and sometimes after the little rains of October–November. Certainly the peak of breeding in the study area is not during the September- or October–December period given by Fry *et al.* (2000) and Harris & Franklin (2000) for East Africa and our region, derived from only four records for large “Region D,” by Brown & Britton (1980). These last likely were from the vicinity of Nairobi, where there are but two rainy seasons. From birds handled, the molt starts April–May, and ends August–February (four non-molting adults represented freshly molted individuals in August, January, and February, and one not yet molting in April). These data support an April–September main breeding season, with molt starting early in that period and ending late therein and onward.

Specimen data. We netted 12 birds, 11 adults and one subadult, and picked up a dead adult that was measurable. The 11 adults weighed 67–87.5 g (76.6 g), and eight of them had wings 108–119 mm (111.7 mm). The data fit well with those available for the race *M. b. approximans* of Kenya E of the Rift Valley, which they represent because of the usually bright, rufous-chestnut breast band (Fry *et al.* 2000) that typifies this race, and extends, often as paler cinnamon, to the sides and flanks. There are scattered black filaments, longer than other feathers, on the crown of most adults, not mentioned in the references cited above. The gray of the head is darker than shown for this race by Fry *et al.* (2000); see Zimmerman *et al.* (1996, Plate 83). It sometimes shows white at the base of the mandible, on the sides of the chin. Molt was noted above; one January adult showed asymmetrical molt of the tail, which was fully fresh on one side and half-new on the other. The dried out, dead adult that we found weighed 51.5 g. The subadult was molting into full adult plumage, with underparts showing only a partial rusty band and wing coverts tipped with yellow (new feathers) and dull buff (old feathers). Soft-part colors: All had a large black bill, and seven adults we had time to check showed an all-black mouth and

tongue. The subadult showed the mouth lining entirely pink below and pink above, shifting to black toward the bill tomlia. Orbital skin was black. The eyes were gold-yellow, yellow-orange and pale orange; two closely checked showed the iris gold with a thin orange ring in the center or farther out, near the outer edge. The subadult exhibited a yellow eye with a fine orange outer ring. This subadult also had a wrinkly belly skin. The legs were gray-blue, generally. The legs and feet of the subadult were pale blue-gray, with the scales edged in cream, which yielded a "powdery" gray tone to the overall color.

STURNIDAE Starlings, oxpeckers

Red-winged Starling *Onychognathus morio*

Months. All except March, when we were in the study area least; resident in Mukutan Gorge (Fig. 13).

Ecology. Found about the lower Mukutan River and its tributaries, PK, UL, MB, and S to EG; uncommonly flying over other areas (OD, Dirty Dam, Dump), but attracted to nesting sites near water, as at Ol ari Nyiro Springs pump house, the nearby lodge, and the buildings at GMF. Large flocks were noted August–February and once in June, but mainly feeds out from the Gorge in groups of four–30, to areas N, E, and SE. It is attracted to fruiting trees, especially figs *Ficus glumosa*; also eats olives, and fruits of *Euclea divinorum*, *Carissa edulis*, *Rhus* sp., and *Canthium lactescens*. Several hundred foraged for figs with a troop of yellow baboons and hornbills (Crowned and Hemprich's). Also forages with other starlings and seen once with Red-billed Buffalo-weavers foraging on the ground. Hawks termites and one fed a lacewing fly to its young. At MK attracted occasionally to a salt deposit in a bank of the river; seen clinging to the bank and pecking at the soil, and entering abandoned Black Saw-wing nest holes, apparently feeding on salt therein. At least nesting pairs drink and sometimes bathe in bird baths, where very aggressive to other birds.

Movements. Resident, flying out as far as 15–20 km from the Gorge, in foraging. We have not noted Bristle-crowned Starlings *O. salvadori* with the Red-wings, although the former may occur in the Gorge farther W, at lower elevations (Stevenson 1980, both occur about Lake Baringo).

Behavior. Generally well known (Rowan 1955, Feare & Craig 1998, Fry *et al.* 2000). Aggressive to smaller birds, e.g., one F attacked and supplanted a singing Stripe-breasted Serin.

Voice. Rather well known (references above). The usual contact note we heard was a double "chee-ew"

(also "whee-cheew," "chwee-cheer"). The whistled and warbled song has been well described (Rowan 1955, Feare & Craig 1998, Fry *et al.* 2000); we heard songs April–August and November–December. In aggression we heard a F call "tew" as it supplanted a serin, "skeee-ee" and "skeeeaaaa" calls, and a hissing like that of an angry, spitting domestic cat (no bill snaps were noted, see Feare & Craig 1998). Scolding calls frequently were heard from bathing and drinking adults, possibly to keep other birds away; these ranged from a "ggraakk" or "grrrraaaak" to a longer version of the aggressive call mentioned above, a "kreeeeeeeah".

Breeding. Breeding is indicated March–July, occasionally on to September, and sometimes November–December, i.e., during and after all three rainy seasons. One pair nested in the little pump-house shed at Ol ari Nyiro Springs in June 1994 (four eggs, three fledged), possibly in December 1995, in April 1996 (two nestlings) and in July 1997 (two eggs). Another pair nested at a GMF building May–June 1991. Possibly nested August 1987 in an abandoned swallow burrow at MK. Also at MK, pairs carrying food (fruits) were observed flying downriver toward the Gorge in May 1994 and December 1989, while a F fed a fledgling in a tree there in June 1991. The breeding period these suggest is in agreement with periods of song noted above, and with (post-breeding) occurrence of large flocks. Breeds January–August W of the area at Lake Baringo (Stevenson 1980; also September–October, Feare & Craig 1998). A stick nest at 3.2 m on a ledge in the pump-house with four eggs 24 June held three young that we weighed 12 July, when they were c. one week old. These weighed 78.75, 72, and 56.5 g, had eyes barely starting to open, downy tufts on head and back, and pin feathers visible in wings and tail, except for the laggard third, light bird (nonetheless all three fledged, *vide* S. Njagi). We had taken one egg from the nest 26 June, for examination, and found it blue with maroon markings larger and heavier at the large end of the egg; it weighed 9.8 g and measured 34 x 22.75 mm, the measurements and color very like those of Plates 127–128 in Tarboton (2001). The adults were sufficiently alarmed to make us cease further handling of eggs at that time; the adults were away when we examined the nestlings. The nest at GMF was 5 m up a chimney, to which access was gained through a break in the metal protective mesh. As we watched nearby in gathering darkness, the F moved about, twitching her tail; she drank with the M at a bird bath, then entered the chimney at 18:40 h. The M flew upslope, and

there was no further activity before dark, so the F incubated or brooded young in the nest overnight. Most of the local Red-wings doubtless nest in the rocky faces of the Mukutan Gorge, W from Python Pool, where numbers up to 350 have been seen.

Specimen data. In addition to the three nestlings that we weighed (see Breeding above), we netted an adult F that fed on salt in the bank of the river at MK; her accompanying M had sung above the bank. The F weighed 133.5 g; it was in late molt and the wings exceeded 148 mm, within the range of *O. m. morio* (Fry *et al.* 2000). Soft-part colors: The F had a gray-black bill, and pink mouth lining (mouth color not noted by Feare & Craig 1998, or Fry *et al.* 2000). The nestlings had a horn-brown bill with yellow mouth lining, yellow inner edges of the bill and yellow gape flanges.

Blue-eared Glossy Starling *Lamprolornis chalybaeus*
Months. All (but not in all years); largely breeding visitor April–September.

Ecology. Usually appears in numbers just before or during the big rains, in late March to May; absent most years October–February. Arrives usually in flocks of four–20, generally noted all over the study area within a few days. Gathers in larger flocks to roost, often in a tree below or alongside of eagles and falcons, and moves about in flocks gradually increasing in numbers from July–September. Favors open bushland and pasture areas with game or livestock and bushed or wooded grassland with fruiting trees or bushes; nests at edges of woodland, riverine woods, *Combretum* grassland, and sometimes within dense woods, depending upon the availability of cavities for nesting. Feeds with all other starlings. Regularly associates with and forages around groups of at least seven large and medium wild mammals, cattle, horses, guinea-fowl, and Crested Francolins, occasionally landing and perching on the backs of the mammals. When feeding on the ground it may join diverse species of weavers and other finches. Hawks insects, especially alate termites, and may fly high in pursuit of them, joining rollers and Violet-backed Starlings. Eats diverse insects, spiders (Feare & Craig 1998, Fry *et al.* 2000), and fruits, including those of *Carissa edulis*, *Euclea divinorum*, *Aptodytes dimidiata*, *Rhus* sp., *Ficus* spp., olives *Olea europaea*, and *Strychnos henningsii*, in order from most frequently to least frequently observed. Occurs about carcasses, taking insects and meat. Dominant to Superb Starlings at hanging meat, but numbers may gradually force out the Blue-eareds. Two of seven attacked and wounded a fledging Hildebrandt's

Starling; the Blue-eareds were chased by mobbing Hildebrandt's Starlings, and other passerines and rollers. The starling itself is a mobber of Gabar Goshawks (one of which plucked a Blue-eared Glossy Starling out of a *Euclea* tree where it was feeding), other hawks, owlets, squirrels, snakes, cuckoos, and honeyguides (Black-and-white Cuckoo, Feare & Craig 1998, and Greater Honeyguide, pers. obs., parasitize this starling). Forages at times in elephant dung. Drinks regularly, sometimes bathes. Can be seen foraging in dark conditions about dawn and dusk, when most diurnal songbirds are roosting. We have seen flocks as large as 250 (in January) and 300 (in September), associated with fruit-foraging or drinking at dams. Visits fires that are not closely attended, seeking discarded foodstuffs, and taking insects fleeing from burning firewood.

Movements. Discussed above. No pairs seem resident in the study area (they may exceptionably be so, in very wet years, about habitations), unlike the Rift Valley situation reported by Dittami (1987; see also Feare & Craig 1998, Fry *et al.* 2000).

Behavior. We observed courtship feeding in April and May. Pressure on availability of suitable nesting cavities leads to many confrontations of this aggressive starling with other secondary cavity-nesters, as well as the primary cavity-nesting woodpeckers. Battles fierce enough to cause feathers to be pulled out occurred between the starlings, and pairs of three species of starlings, Mosque Swallows (one landed on the back of a flying starling), oxpeckers, Brown Parrots and Lilac-breasted Rollers. Some disputes over cavities can last for several days. The persistent, aggressive glossy starling, acting in pairs, often is the victor, taking over the disputed cavity. All of these species are less numerous overall than the glossy starling, and, except for the large parrot and roller, their numbers are apt to reflect some losses of nest sites to that starling. Occasionally this starling attacks other birds that do not compete for nest sites. Some of these may be foraging competitors. Lilac-breasted Rollers on occasion drop down onto a ground-feeding Blue-eared that is thus driven away.

Voice. Most commonly heard call, diagnostic for this it, is a nasal "nyaak" (also "neeyank"), uttered by over-flying birds in pairs or flocks; more scream-like "jweeer" calls were heard less frequently (Feare & Craig 1998). The song is a warbled, whistled, squeaky, diverse array of notes (Feare & Craig 1998) heard in all months, but predominantly April–September, and especially April- or May–July. Long-sustained singing was ob-

served almost exclusively in May–August. Nocturnal singing at camp only took place during late April–June; in late March to September songs were heard at night in the months just noted, but from just predawn (05:50–06:05 h, depending upon cloud cover, perhaps) to near-dusk (18:40 h, September) or dusk (18:50–19:00 h) in the other months of March–September when not singing in the night. We ascribe mimicry to this starling on the basis of mimicked White-rumped Helmetshrike calls among notes of songs at several sites and times. Some of its whistles resemble those of European *Sturnus vulgaris*. In the hand, gives a harsh “skreek” call. Begging nestlings call “chee- chee-chee” to “EEP-EEP-EEP.”

Breeding. We found 75% of breeding indications in May–July, and 96% April–August. Starlings were seen entering cavities as pairs only in February–September; fledglings were observed May–September, and subadults were noted July–November. Dittami (1987) showed that testosterone levels, gonad size, observed breeding and molt were bound to rainfall. We noted that levels of song and nesting activity occurred strictly in the April–August period regardless of poor or good rainfall in the big rains and July–August rains (there were more failures after poor rains); also, heavy little rains were ignored – the Blue-eared Glossy Starlings in fact were largely absent from the area November–January. Occupied nests numbered one in March, seven in April, 37 in May, 34 in June, nine in July and two in August. Take-overs of nesting cavities involved other starlings, Nubian Woodpecker and oxpecker. Apparently the pressure on such secondary hole-nesters in the study area is much greater than at Nakuru National Park in Central Kenya, where these starlings nested in “savanna” early in the season, and in woodlands later (Dittami 1987); in the study area pressure was equally high everywhere.

Nests were in holes 0.5–16 m (mean 3.5 m, $n = 38$) above ground in a tree; not counted were nests in fence posts and buildings (at height lower than mean). About half were in natural cavities, and the rest in old cavities likely excavated initially by woodpeckers, but often having been used by other secondary cavity-nesting birds prior to use by Blue-eared Glossy Starlings. Preferred trees were olives, with their abundance of natural cavities, *Acacia abyssinica*, *A. xanthophloea*, *A. gerrardii*, *Combretum molle*, and also *Canthium lactescens*, *Rhus natalensis*, and *Euphorbia candelabrum*. In GMF several pairs nested in buildings; one nest was built partly within a broken piece of wall in an occupied room, behind a box, on a sill (entry was gained through a hole beside the door; in

this nest two broods were raised in April–May and May–July 1994). The clutch was 2–4, mostly three, but usually two fledged. To our knowledge no 4-egg clutch fledged four young. Eggs seen were clear blue, or (mainly) blue with fine lavender to rusty spots (one with several larger, gray spots); one, left over in a nest, weighed 5.35 g (measured 28.7 x 19.8 mm) and proved to lack a yolk. These resembled eggs shown by Tarboton (2001: Plate 128). Fecal material was seen to be removed on several occasions. A nest at 2.2 m in an olive tree, was found with a slender-tailed mongoose *Herpestes sanguinea* in it 14 June 1990; two nestlings near fledging were killed by the mongoose. Greater Honeyguides parasitize this starling, but we found only one white egg that did not hatch in one nest, and we saw F Greater Honeyguides driven from this starling’s nests. One fledgling Greater Honeyguide was attended by two Blue-eared Glossy Starlings, and begged from others when they were absent (the youngster was pecked by these other starlings, which may have hastened its rapid independence in two days). Three starling nestlings from the GMF nest mentioned above were examined while their parents were away 18 July 1994. They weighed 75, 77 and 87.5 g, had many mites, their flight feathers were in pins, the eyes (brown) fully opened, and had a yellow mouth, with yellow wattles at the corners; their brown-black bills were yellow-tipped.

Specimen data. We netted 53 Blue-eared Glossy Starlings, most in the April–August (breeding) period; three are the nestlings treated above. These included: 12 adult MM, sexed by cloacal protuberance; six FF with a brood patch; 26 adults that were unsexed; two juveniles; and four subadults (plus the above-mentioned nestlings). We encountered difficulties with use of mouth color and eye color, ageing these birds (see below). The 12 MM weighed 85.5–103.75 g (95.8 g) and had wings 135–152.5 mm (144.4 mm); the former are close to Dittami’s (1983, 1987) weights, and the latter are less than his wing lengths (11 of 12 are worn, April–July birds). Six FF weighed 74.5–101.5 g (86.5 g); two at 101.5 probably were laying eggs. Four FF (two had started wing molt) had wings 125.5–136 mm (131.4 mm); thus weights were higher and wing length less than expected from Dittami’s results. The 26 unsexed adults weighed 78.5–109 g (93.3 g), and 19 measurable had wings 131–153 mm (139.8 mm). MM and FF were probably represented in roughly equal numbers in this sample. The only immature weighed, other than the nestlings, was 84 g. Four subadults weighed 82.5–86.5 g (84.6 g), about as predicted from Dittami (1983) if both sexes were

included. Of the few birds molting, those of May–July were starting the annual molt, and those of August–October were completing it, or the post-juvenile molt. None of the six starlings netted December–February was in molt. The bulk of molting seems to occur from July–October or November; Dittami (1983) had molting birds predominantly August–November, with significant May–July molt as well. Soft-part colors: The bill is black, but nestlings and fledglings may have a yellow tip. According to Dittami (1983) young starlings have a yellow mouth lining that darkens and “disappears” at about 14 months from hatching, the mouth then being all black. In fact, young Blue-eared Glossy Starlings have a pink throat and yellow mouth lining, or a pink-yellow mouth that may darken from the edges of the bill inward. Not all adults, and particularly FF, have an all-black mouth lining. Four breeding FF weighing to 101.5 g, had the mouth pink, with blackish only about the tomlia. Adult MM have the mouth lining black or blackish, the tongue is usually black, but may be pink, and the syringeal area can be pink in some. Among unsexed adults the mouth ranged from pink to blackish or fully black; some were pink-yellow in part. Possibly younger FF are pale-gaped and older FF blacker-gaped, more M-like, as in Scaly-throated Honeyguides. The narrow bare orbital skin is black. The eyes are brown or gray-brown in nestlings and juveniles of this species, and various colors (yellow, gold, orange, Fry *et al.* 2000), but not dark in adults. We were struck by shifts in eye color within individuals held in the hand, or taken from bags in which they were held. Undoubted MM had eyes noted as all-yellow to entirely orange; FF tended to have less orange eyes, but they could become fully orange-eyed. In fact, eyes of adults usually showed two or three areas of color, usually paler toward the pupil, orange (or gold) outwardly, or in the center, with another yellow ring around the outer iris. Yellow could be expanded such that the orange color was all but extinguished, and vice versa. Hence, beyond the age of *c.* five months, at which the eyes become yellow, age and sex likely cannot be distinguished by overall color of the eyes. The birds represent the inland race *L. c. cyaniventris* (Fry *et al.* 2000).

Rueppell's Long-tailed Starling *Lamprotorornis purpuropterus*

Months. All; few if any resident in all years. Locally common.

Ecology. Breeds in riverine woods with tall trees, and tall woodland where it may be resident in small numbers during years with above average rainfall in two

or three of the rainy seasons. Also a few pairs breed about gardens at Kuti and Center. Not observed in earlier periods (1960s), probably occurred in 1980s at LU, where common in 1986, and first observed at EG (one subadult) in 1986. It increased in numbers and spread 1987–1990, and especially 1990–1994. Common in late 1990s in S half of study area. Its upper elevational limit is usually given as 1600 or 1800 m (Lewis & Pomeroy 1989, Feare & Craig 1998, Fry *et al.* 2000), although Stevenson & Fanshawe (2001) gave it as 2000 m. Except for the lower Mukutan River sites (MK, LA, EG) at 1740–1790 m, the other sites are all above 1850 m, and it is common at SI, PO, and LU (1900–1980 m), and found at 2000–2040 m about Nglesha. It may have invaded the area from the Bogoria-Baringo area to the W (Stevenson 1980, Hartley 1986); is not found at Pinguone (Schulz & Powys 1998) or Mutara (Olson *et al.*, undated MS) to our E. Although requiring tall trees for nesting in cavities, it forages in low trees and bushes, and on the ground in open grassy patches. It eats insects and fruits. Not only eats termites on the ground, but clings to the bark of trees and extracts termites from their earthen tunnels, apparently being able to distinguish the dark-colored, recent termite work that holds the insects. Also forages at times in elephant dung, probably for associated insects. Eats fruits near its wooded centers; does not join Blue-eared Glossy Starlings and others in open *Euclea-Carissa* fruiting situations. We have noted it eating fruits of *Euclea divinorum*, figs *Ficus* spp., and “muteta” fruits *Strychnos henningsii*. It also eats flowers of *Apodytes dimidiata*. It drinks regularly, flying to springs near its home areas and from water baths and bathes in sprinklers on lawns at Center. Roosted many times in tall, usually leafless or dead *Acacia xanthophloea* trees, especially below one or two roosting Tawny Eagles at EG, where usually outnumbered by Blue-eared Glossy and Superb starlings. At times forages on ground with other starlings, and in mixed-species foraging flocks. Readily joins or leads birds mobbing snakes, and birds of prey. At EG, on approach of a hunting Gabar Goshawk, a M starling flew to perch beside a Lilac-breasted Roller, resulting in the hawk turning away from it (them)! Note: The inclusion of the Golden-breasted Starling *Cosmopsarus regius* in our preliminary list for the area (Horne & Short 1993) was an error, as it was misreported to us.

Movements. Obviously disperses some distance or would not have emigrated to the study area (see above, Ecol-

ogy). Numbers at breeding sites definitely drop after September, and key sites may have but one pair present year-round in years of average and below average rainfall. Some may roam locally, but is usually absent from wandering, foraging flocks of Blue-eared Glossy Starlings away from the wooded sites where it breeds, and particularly not in sites where other starlings gather to eat *Carissa* sp. and other fruits.

Behavior. Disputes for nesting cavities, particularly with Blue-eared Glossy Starlings, Lilac-breasted Rollers and Yellow-billed Oxpeckers. Is less belligerent generally than the Blue-eared Glossy Starling. Chases young Greater Honeyguides, possibly only because the honeyguides tried to beg food from them, as we have no direct evidence that it is parasitized by Greater Honeyguides. Displays, sometimes in groups, with much flicking of the wings (both simultaneously and asymmetrically, see Feare & Craig 1998), and movements of the tail. It often flips the wings upward, then to the rear and downward, as it lands. Wing sounds are very audible during interactions. The M courtship-feeds the F. One M flapped its wings before entering its nest cavity to feed the young, and did so again as it left the hole, before flying.

Voice. The vocalizations are quite melodic generally (Feare & Craig 1998, Fry *et al.* 2000), though it has some harsh parrot-like notes, e.g., its “waak” call note. Its song is usually simple, a “pa-wee, pweet, pweet-cheeeeh,” with variations (references above, and Dittami 1987), including mimicry of orioles. The F often sings a shorter song following, or simultaneous with that of the M; a “duet” (Dittami 1987). Extended bouts of singing, singing through the middle of the day, and MF singing, have been heard in all months but March and October, with nearly two-thirds of songs in May–July, and 86% in April–September (12–13% in November–February, peak in January), the main breeding months. Nestlings call “chch–chch–chch,” to “yek-yek,” increasing the tempo and volume when being fed.

Breeding. Of 41 nestings, 37 were in April–July (the other four were in September, January and February); of 36 instances of fledglings being fed by parents, 33 were in May–September (the others were in November–January). Thus, breeding is strongly seasonal, in contrast with the situation at Dittami’s (1987) study area in Nakuru Park. Possibly older, established pairs may nest some years in November–January as a means of limiting the pressure of securing a suitable nest (no blue-eareds nest then). Availability of food may be a major factor limiting breeding outside of the periods

of the usually heaviest (April–May) rains and very regular July–August rains. One banded pair nested in May–June 1988, in May–June and again in July–September 1989, and in April–June 1990; in 1991 each had a new mate, the pair with the original M nested in December, and that with the original F, in May. The F which still retained one band in 1994, nested April–May that year. Hence, individuals do vary their breeding periods. Nests were at 2.5 to 25 m. Virtually all nests were in the prevalent acacia of the particular site (*Acacia xanthophloea*, *A. abyssinica*, *A. gerrardii*), or in olives, and usually in a dead stub or dead tree. Both sexes incubate, with the F doing so perhaps more than the M; both feed the nestlings, about equally in some cases, but in others the F feeds more often. At nests with small entrances, the M may pass food to the F outside or inside the nest, and she then feeds the young. Nest sanitation was performed largely, sometimes apparently only, by the F. The young remain with parents for several months or longer, and probably provided the nucleus for enlargement of “colonies” and its spread from the 1980s into the 1990s. For example, there initially was one bird, then one pair at EG, then two pairs, then three pairs; a pair then appeared at nearby LA, then there were three pairs there and one pair at MK (the three sites are within 1.5 km of each other), as well as a fourth pair at EG.

Specimen data. We netted few (11) individuals, as this starling usually forages in the open and passes over nets to its nests. These included four MM, three FF and four immatures. One M, in good plumage 15 May at PO, lacked one lower leg and foot – it showed a F weight of 70.75 g. The other three MM, netted July–August, weighed 92.75–94 g; two not molting had wings 147 and 156, rather closely matching Fry *et al.* (2000) figures for *L. p. purpuropterus*. Of three FF, one from May had a brood patch and likely was laying, weighing 101.5 g (well above F and even M weights of Fry *et al.* 2000); the other two weighed 68 and 69.75 g, one with a measurable wing of 129 mm. FF are *c.* 20% smaller than MM and have a notably shorter tail (and pale mouth lining, see below). We could not discern color phases (Feare & Craig 1998); our birds were bronzy green on the crown and very purple to violet-blue elsewhere. When last noted one F was at least seven years of age. Dittami (1987) found that no breeding birds were molting; one F we netted with two fledglings 18 June was in late wing and tail molt, and a July M was in the same state, whereas a breeding July F was starting its primary molt.

The four juveniles weighed 64.5–71.5 g (68.7 g); two not molting had wings of 134 mm. These were much less glossy than adults; juveniles with dark eyes look peculiarly all-brown-headed alongside glossy parents with their white eyes. Soft-part colors: The bill is black. Mouth lining of adult MM is black, including the tongue, with some pink underneath the tongue; the light M with a missing leg had the mouth pinkish black all over. FF have a pale mouth, all pink with dusky at edges of bill tomlia (laying F), to mixed pink (at rear, with some dusky) and yellow (front of mouth). Juveniles have yellow mouth lining with yellow gape wattles, but the colors shift. The eyes are white or creamy white in adults; the juveniles had eyes brown (one), gray-brown (two) and brown-white (one). Many fledged young, even after independence, still show darkish eyes and may have yellow still visible at gape corners. Thus it is noteworthy that the sexes are not alike, as Fry *et al.* (2000) stated.

Hildebrandt's Starling *Spreo hildebrandti*

Months. All, but often absent when not breeding.

Ecology. We contribute information regarding this little-known species (Feare & Craig 1998, Fry *et al.* 2000). It is more widespread in the study area than is Superb Starling and does not gather into flocks so large as that starling; it occurs more often in pairs, less often in the groups of five to 10 in which one often finds Superb Starlings. Occurs in open woodland, woodland edges, degraded woodland, bushland with some trees, and *Combretum* wooded grassland. Though frequenting gardens and habitation it is less numerous there than Superb Starlings. It is less often seen in pastures and other extensive open areas, including degraded pastures with much bare ground. At Nglesha it occurs in woodlands and edges, without the Superb, which is common at Nglesha Center. At PO, Hildebrandt's Starlings penetrate often dense woods (Fig. 16), where some pairs nest; Superb Starlings infrequently occur in nearby degraded bushland and pastures. Although mingling in mixed flocks with Superb Starlings, it more often associates with Blue-eared Glossy Starlings; also occurs with Wattled Starlings and, less often, Violet-backed and Magpie-starlings. The largest number seen together was *c.* 50 among several hundred Blue-eared Glossy Starlings. At EG roosts in large dead acacias (*A. xanthophloea*) with Blue-eared Glossy, Superb, Violet-backed, and Rueppell's Long-tailed starlings, often in (loose) association with one or two roosting Tawny Eagles. Sometimes forages with serins, Chestnut Weavers, drongos,

thrushes and babblers, on ground and low in trees and bushes. Hawks alate termites, sometimes high in air; also flies at, breaks open, and clings to arboreal termite tunnels, pulling out termites. It feeds on fruits of *Carissa edulis* and *Euclea* spp. especially, and also on those of *Rhus* sp., *Apodytes dimidiata* and *Olea europaea*. Sometimes attends lion kills, feeding on insects by hawking and plucking from ground. It mobs snakes and Gabar Goshawks. Often interacts with dominant Blue-eared Glossy Starling, a serious nest-cavity competitor. Occurs in smaller numbers October–January, and only every three or four years in those months; numbers fluctuate from year to year during February–September. Individuals and pairs rarely remain near breeding sites all year, but move about, often with other starlings.

Movements. Most move locally, and indeed may leave the area October–January.

Behavior. Is more agile in flight than heavier Blue-eared Glossy Starling; thus, a displaying M Hildebrandt's Starling can drive away the larger starling, one-on-one. Waves wings and sings in groups of up to four MM at a time, but uncommonly and only where numbers of them are breeding; wings may be moved in a circle, together or one at a time. With F, seen to engage in a courtship flight, with stilted wingbeats and both calling repeatedly. The M also droops its wings in front of its mate, singing "at" her; the rump (orangy buff) is conspicuous during the display. Usually submissive to Superb Starlings that tend to "gang-up" on lone Hildebrandt's at times. Has been seen to attempt takeover of a Gray Woodpecker's nest, but could not keep that M from returning. A young Hildebrandt's Starling attempting to leave its nest for the first time (see below) was viciously set upon by up to seven Blue-eared Glossy Starlings, that battered and wounded it, despite mobbing parents and nine other species of birds. A pair of Blue-eareds commenced nesting in the cavity the next day.

Voice. Has a distinctive double-noted call that is incorporated into its song, a "chur-rakk" (variable at times, to "ny-eh," "g'rek," "ga-rrek"), diagnostic for it (not unlike the call of Magpie-starling, pers. obs.; see Feare & Craig 1998). The song, heard predominantly April–August or September (heard in all months, but less October–February than in April or September), varies from repeated call notes ("ker-rak, ker-rak, ker-rak") to more of a combination of warbled and harsh notes ("ch-rak, ch-rak, chee-chee-wee, chee-wee, rak, rak, rak"), or repeated "tchur-wee" and "tchur-week" notes, or a simple "chur-ee, chur-ee,

chur-eee.” Also sings a low song with “tchek-ek,” piping and warbling notes in it. Repetitive singing was heard only April–August. Renditions from elsewhere were provided by Zimmerman *et al.* (1996), Feare & Craig (1998), and Fry *et al.* (2000). In the hand calls “skreee-ew;” when released, gives the “chur-rrak” call. *Breeding.* Mainly breeds April–August, the great majority of nests found in May–July (one each in September and October, and seen entering cavities January and April). Fledglings being fed by adults were noted June–August, and once in December; independent immatures were seen July–October. Breeding is thus during big rains and following July–August rains, with occasional nesting after the little rains. Later breeding in August–October is likely due to loss of nesting cavities to Blue-eared Glossy Starlings. A possibly fledging starling had very short wing and tail feathers, as well as down projecting about the head and sides of its back, and it was not fully feathered below, hence probably plucked from the nest by Blue-eared Glossy Starlings before ready to fledge. Nests were diverse, some in old holes of woodpeckers (attempts to usurp occupied nests of two woodpeckers, and of Yellow-billed Oxpeckers were unsuccessful), and others in natural holes, some poor quality (with splits and holes letting in light). Most were over 2 m (lowest, 1.2 m), and to 10 m in stubs of acacias (*Acacia abyssinica*, *A. gerrardii*, *A. xanthophloea*), *Combretum molle*, *Canthium lactescens*, and especially *Olea europaea*. These largely were beyond our reach and often in precarious (dead, rotted wood) situations; we spied three eggs inside one nest. Both adults feed at *c.* 1–8 min intervals (early in the day), bring diverse insects, mainly grubs (“green inchworms” to one nest). Mainly two young fledged; we saw no “families” of more than four starlings. The young become independent rapidly, and then may form groups of four to six that forage together.

Specimen data. We netted 13 adults, a subadult and two immatures. Several could not be treated fully. We sexed only seven, using color of mouthparts (see below). Three MM were 47–58.5 g in weight, and 116–121 mm in wing length; four FF weighed 47–53.5 g and had wings 109–113 mm. Six unsexed adults weighed 48.75–60 g (55.3 g), and had wings 108–116 mm (111.8 mm). These correspond well with data in Feare & Craig (1998) and Fry *et al.* (2000). A subadult was at 54.5 g and two immatures weighed 44.5 and 46 g. The likely nestling rescued from Blue-eared Glossy Starlings was sooty above and on its head, with green gloss visible only on wings and tail;

its underparts were tan, and the breast streaked sooty. Within two weeks it became sooty on the upper breast to throat, the streaks disappearing. Soft-part colors: The bill is black in adults. A nestling-fledgling had bill mainly dull orange-yellow, broadly along tomtia, about the nostrils, and at tip; only the culmen area appeared brown-black. The mouth of young is yellow, including a gape flange, with pink at the rear, toward throat. Fully adult MM have mouth largely black. Three adult FF had the mouth entirely pink or dull pink; some (older?) FF show blackish (not full, shiny black) at the edges of bill, beside the tomtia, but otherwise are pink. Some unsexed adults were blackish pink to pinkish black over the mouth; these likely were of different ages (wing measurements suggest that most were FF). The subadult had mouth mainly pink but grading laterally into black at edges of the bill. The orbital skin is narrow, but was dusky yellow in the “nestling”, black in older immatures and adults. The iris was wholly brown in the very young bird; the brown very gradually shifts to orange. In adults the eye usually is red to red-orange outwardly, with an inner ring of yellow-orange. Some had orange outer and yellow inner rings. This variation is partly due to the starlings shifting color of the irides by expanding and contracting the inner ring, thus reducing the red (eye more orange or gold) by expanding the ring, and enhancing the red or red-orange of the outer ring by contracting the (paler) inner ring. We have little to report on molt; only four adults showed wing and tail molt, two starting the molt in May and June, and two in mid-molt of those areas in May and August. It is clear that molting occurs at least as late as September, and likely thereafter, and is not restricted to January–May as Feare & Craig (1998) reported.

Superb Starling *Spreo superbus*

Months. Common resident locally.

Ecology. Less widespread, but more numerous (social) than Hildebrandt’s Starling, it thrives in open, degraded pasture and garden situations, especially in the area around the GMF slope-Kuti-Center triangle, about Nglesha Center, sometimes near dams, and around South Boma, Saddle Boma, and the Main Gate pasture area. Flocks or groups may appear elsewhere, and may breed in small numbers, as about the glade and South Lugga at EG, at PO, and LU open areas, and at NP. Probably is expanding its range about habitation; van Someren (1956) stated that it was occasional in Nairobi, whereas by the 1980s was common in Nairobi wherever there were trees. It is generally well known (Feare & Craig 1998, Fry *et al.*

2000). It readily associates with other starlings. Often forages around livestock, especially donkeys, and about impalas, waterbucks, serins, babblers, sparrows, and other ground-foraging birds. From nesting areas, groups go out to feed, often 1–2 km or more. They forage for insects in dung, and on the ground, mainly, taking caterpillars, grubs and termites; hawks termites during emergences. Readily eats meat, seen at lion kills in its main areas of occurrence, and probably also eats insects attracted to carcasses. Feeds on fruits, especially of *Carissa edulis*, but also of *Rhus* sp., *Ficus* spp., *Canthium lactescens*, and over 100 fed with other starlings on fruits of *Apodytes dimidiata*. Bathes casually, often in puddles after rain. Widespread in our region (Lewis & Pomeroy 1989).

Movements. No indication of movements out of or into the area, but numbers fluctuate greatly; in dry years more or less confined to areas at and adjacent to human population centers, and far fewer seen than in wetter years.

Behavior. Often quarrelsome with fights within groups (we have seen one batter another to the ground, stand on and peck it), and its sociality and nesting habits lessen aggression between it and larger Blue-eared Glossy Starling. Four feeding in the glade at EG were supplanted one by one by a M Rueppell's Long-tailed Starling. Chases other starlings occasionally, and five attacked a go-away bird and drove it all about a jacaranda tree. We have seen a F Diederik's Cuckoo following Superb Starlings, and another F of this cuckoo chased by a pair of the starlings. On four occasions an adult or subadult M Greater Honeyguide chased one or more Superb Starlings. Possibly these two nest parasites sometimes host the starling. Black-lored Babblers forcibly kept a larger group of Superb Starlings from feeding at a carcass in the Center meat shed. Courtship and other displays were as noted by Feare & Craig (1998).

Voice. Its variable song and its calls were discussed by van Someren (1956), Feare & Craig (1998) and Fry *et al.* (2000). Sometimes uses a very simple, repeated "zwee-cher-weee" song. Songs heard in the air, away from territory, as by individuals occasionally overflying GMF (flocks or groups overflying territorial pairs or groups elicit songs from starlings below). Songs heard mainly April–July, and sometimes to August, and, to a lesser extent, December–January, defining the breeding period.

Breeding. Dependent fledglings and nests were noted in all months except September and November, but 89% of (56) nests and 89% of (137) fledglings were

observed April–August. The peak of breeding is May–July. Feare & Craig (1998) discussed its group breeding, but we note that scattered pairs breed apart from others and are not assisted by "helpers," as at Posho Corner and the South Lugga at EG. We could watch few nests for any length of time, so have few details of associations among individuals. Of the nests, at least eight were in holes, mainly old picid holes, thus 14% of the nests overall, but 29% of the January, April, and May nests; holes are used for early nestings in particular. Hole nests were at 1.2–5 m up; one was in a tennis-court post and had served parrots and Gray Woodpeckers previously, another was in a post-hole, formerly a Nubian Woodpecker nest, and others had served glossy starlings (in *Acacia abyssinica* stubs). A few had straw visible at the entrance. One of these was lost when the tree fell, depositing eggs and nest on the ground. The other nests were stick-grass ball-nests, usually with a side entrance, at 1.3–15 m, in *Acacia abyssinica* (especially in dense top, canopy layer), *A. gerrardii* and *A. xanthophloea*, or in a few other, usually dense trees, e.g., a *Euclea divinorum* and high in an *Apodytes dimidiata*. The outer layer combined sticklets, heavy grass (straw) and spiny bits off acacias. Linings contained fine grasses, fibrils, feathers (including those of guineafowl) and a white cloth. The ball was as much as 1 m thick, but more frequently 0.4 or 0.5 m by 0.25–0.3 m (a few were 25 x 20 cm). Nest construction was rapid; at times material came in at 2–3 min intervals, the starlings pausing, with a "wee-chee, wee-chee" before leaving the nest. Low isolated nests of straw-sticks suffered predation, likely from baboons. We could discern two or three eggs in several nests, with usually two young being produced. Adults carry away fecal material from the young. We observed at least three adults feeding at nests on several occasions. The straw-stick nests allow more social behavior, as several nests can be placed in one large acacia, or in nearby acacias; it was from such situations that the adults went out in parties of four–10, and arrived back in groups. We observed no adults with juveniles feeding at other nests, nor did we detect second broods at the same nest, although several sites were utilized in consecutive years. Note that the main breeding period matches neither the peak periods of February–April and November–January of Brown & Britton (1980; these for our region D, but of course not from within our special rainfall regime), nor the peaks given by Feare & Craig (1998).

Specimen data. We netted 24 individuals, the bulk of these in April, May, July, January, and February. Of

these, three May adults (of four) were starting molt or in mid-molt, four of seven July adults were completing molt, two of three January adults were ending molt, and both subadults, presumably year-old birds (based upon eye-color changes, see Feare & Craig 1998), were molting, an April one in mid-molt and the August subadult commencing molt. Adults ending the molt in July, along with the April subadult, perhaps were non-breeding birds, with (some) breeding adults molting May–August or later. The eight adult MM weighed 60.25–79.75 g (70.5 g), three adult FF were 61.75–64.5 g, and eight MF weighed 59.5–71.5 g (65.22 g), these fitting closely with weights of Fry *et al.* (2000) for Kenya. Wing lengths of eight adults were 116–124 mm (119.2 mm), which is not far from results of Feare & Craig (1998) and Fry *et al.* (2000). The subadults were at 56.5 g and 58.75 g, and the juveniles weighed 58.5–66 g.

Soft-part colors: The bill is black. MM have the mouth lining black, with a pink or (once) yellow tongue; FF have the mouth yellow-pink to dusky pink (with blackish toward the tomial edges). The number of unsexed adults is high because they were netted in groups that could not be checked for mouth color, due to a plethora of other birds in net-bags at the time. Subadults had a pink mouth lining; that of juveniles was yellow-pink to yellow, with a yellow gape flange at each corner. All adults had white eyes; one subadult had eyes yellowish brown, and the other, April subadult had eyes white with the outer ring of the iris dotted brown (on white). The subadult eye colors mark them, presumably (Feare & Craig 1998), as 12–14-month-old individuals; they were molting into adult plumage that should have been assumed earlier, according to those authors.

Magpie-starling *Speculipastor bicolor*

Months. February only, in 1981 and 1988; casual visitor.

Notes. Although occurring mainly in lower areas to the N and W (Lewis & Pomeroy 1989, Feare & Craig 1998), it is present just W of the area at Lakes Baringo and Bogoria (Stevenson 1980, Hartley 1986), hence can readily fly up the Mukutan River valley to the study area. Zimmerman *et al.* (1996) and Stevenson & Fanshawe (2001) had 1200 m as its upper limit; we have seen it to 2000 m. It was noted about Center in February 1981 (*vide* C. Francombe). Flocks of 12 to over 100 were observed on seven days of February 1988, from 1 to 20 February. On 20 February one was at Center with a loose group of Superb and

Blue-eared Glossy starlings, and over 100 fed on *Rhus* sp. berries below a cultivated field at Nglesha (at 2000 m). Elsewhere it was seen feeding on *Rhus* sp. N of Center on several days, over 60 were in *Acacia gerrardii* trees W of Kuti 16 February, 20 were near Center with Blue-eared Glossy, Hildebrandt's and Superb starlings 14 February, and over 50 fed with Red-winged and Blue-eared Glossy starlings on *Strychnos benningii* fruits in the Mukutan Gorge (at 1650 m or so) 13 February. Close observations 2 and 3 February in the *Acacia gerrardii* degraded, open woods N of Center showed three or so immatures (basic gray plumage, and brown-eyed) among the c. 25 Magpie-starlings in the flock. On 15 February a flock of c. 50 flew over ML, from the W, across the valley, to the SE (toward Kuti and Center). Thus this starling visits upland areas occasionally, probably to feed on fruits when there are insufficient foods for them in the Baringo area. The Magpie-starlings were observed over an area of c. 22 x 7 km of the study area. Breeding in N Kenya is in May–June, and February is often the driest month; 1987 was, for our area, a drier than average year. Its common call, often accompanied by flailing wings, was a “nyek-nyek.”

Violet-backed / Amethyst Starling *Cinnyricinclus leucogaster*

Months. All; present in all years during July, most years January–February and May–June, bred in 12 or 13 years.

Ecology. Mainly a visitor for breeding and foraging, very common in some years, decidedly uncommon in others. Generally arrives in March–mid-May, depending upon the year, leaving between July and September. It occurs mostly in breeding pairs March–September, with numbers of apparent FF and immatures increasing May–September. Only recorded during October in 1992 (when pairing!), and present but three years in November and five years in December (bred 1988), but present during January in 11 years (singing, pairs predominated, but also small flocks of fruit-eaters that could have remained to breed April or later). It associates strongly with Blue-eared Glossy Starlings and also Wattled Starlings, but much less often with other starlings. Hawks insects regularly, and pursues flying termites and other insects at considerable heights, often flying continuously, somewhat swallow-like, and returning occasionally to a perch. Eats ants and other insects on or near the ground. Also feeds on fruits, particularly olives, and also on *Carissa edulis* fruits and those of *Apodytes dimidiata* and *Can-*

thium lactescens, and sometimes *Ficus* spp., *Rhus* sp., and *Euclea divinorum*. Occasionally forages with flycatchers, drongos, White-rumped Helmetshrikes, tits, bulbuls, and other species. Frequently drinks and sometimes bathes in puddles and bird baths.

Movements. It is a virtually regular breeding and non-breeding visitor (its breeding is hardly intermittent or sporadic, as noted by Lewis & Pomeroy 1989, and Zimmerman *et al.* 1996), in pairs. We have not observed large flocks, or seen other indications of non-breeders and migrants during March–September. Although F-plumaged birds outnumber MM by June, they occur in small groups about breeding sites (see Stevenson & Fanshawe 2001).

Behavior. Generally well known (Feare & Craig 1998, Fry *et al.* 2000). Wing waving is a common display by MM, in groups of up to four, and before FF, when singing; often waves one wing at a time as it sings (one M raised and waved only its left wing). Fights frequently with other starlings, mainly Blue-eared Glossy Starlings, over nest sites; a pair usually can drive away a single (M) of the Blue-eared. We noted (1985) a fierce encounter with Yellow-throated Petronias over a cavity nest in May, and have since seen another at MB 28 April 1990 – a F starling had carried elephant dung into a cavity and one, then two petronias tried for 10 min to extricate the starling, but failed to do so.

Voice. Its song is well known (Feare & Craig 1998). Singing by pairs heard April–September, mainly May–July, and to a lesser extent December–January. We heard one M mimicking an almost full song of coastal lowland Dark-backed Weaver *Ploceus bicolor* at MK 10 January 1985; also noted by Fry *et al.* (2000). Its common call is a distinctive “kweah” or “weah,” with a queesting quality. Interactive calls commonly are harsh, skizzy grating notes (used against other species, as well), and a woodpecker-like “ter-ter-ter.” Fledglings beg in fast “chchch” calls.

Breeding. Paired starlings entering holes, and FF going from hole to hole have been observed April–September and December–February. Active nests were seen April–July, and fledglings being fed May–August, and once December. In addition to cases of elephant dung carried to nests we reported earlier (Short & Horne 1985), we saw elephant dung carried to nests 15 more times, all in April–June. As many as six pairs apparently nested at SI and at EG during May–June 1992, and usually three or four pairs were present regularly May–July at these sites, and MB, PO, LU, and NG (we did not try to find all nests, but saw adults carrying nesting material and food). Nests were

found in 12 of the 14 years of our honeyguide studies. Although we also observed an increase in F-plumaged birds (FF and juveniles) May–September, during which these outnumbered adult MM by as much as 3:1, their numbers were consistent with some being incoming breeders, plus the results of April–May early breeding. For nests they preferred olive trees, but also used acacias (*A. abyssinica*, *A. xanthophloea*), *Combretum molle*, and others (its preferences likely were affected by severe competition with Blue-eared Glossy and other starlings). Most nests were natural cavities, but some were old woodpecker (Nubian, Gray) holes that had had other secondary users. Nests were at 1.3–10 m (4.1 m), most beyond our reach. D. Chepus told us that this starling is a host of Greater Honeyguides, but the only honeyguide interaction we noted was the chase of a M Violet-backed Starling by a Scaly-throated Honeyguide. Green leaves, in addition to elephant dung, are also carried to the nest; we could not determine their source, possibly they were of *Euclea divinorum* (given as *E. keniensis* by Feare & Craig 1998, and Fry *et al.* 2000). One egg, likely of this species, picked up under a nesting cavity 8 April 1993, was pale blue with purplish blotch-spots at the large end and fine spots at the small end; it weighed 3.6 g, and measured 22 x 16.5 mm (see Feare & Craig 1998, Fry *et al.* 2000). We are uncertain of the clutch size locally, but saw only one to two fledged young with adults. Adults and young move quickly away from the nest, and fledglings appear to gain their independence rapidly; they join in flocks of up to six or so, all with the distinctive yellow gape area (some adult FF have the gape area yellow, others do not, see below). Adult eye color (brown with outer yellow ring) is gained rapidly in recent fledglings, and in plumage they are very like FF. Immatures gather in larger flocks with FF July–September, before departing (in August–October). The two fledglings seen with parents at NG 6 December 1988 had a bobbed tail and short wings, hence were from a nest there. Pairs at GMF sang, but apparently found no suitable nesting cavities, during April of some years and throughout December 1995 and January 1996. It must be regarded as an essentially regular visiting breeder in the W Laikipia Plateau during April–July.

Specimen data. We netted 29 Violet-backed Starlings, 10 MM, 15 FF, one subadult M and three immatures. Of the non-immatures, only the April subadult M and one M in February and one F in September were molting, the adults both ending their wing and tail molt. The 10 MM weighed 37–47 g (42.5 g), and had wings

106.5–112 mm (109.2 mm); the 15 FF weighed 40–47.25 g (43.4 g) and had wings 94–108 mm (100.4 mm). The subadult M weighed 43 g, and its wings were 103 mm. We note that, in woods, MM may appear red as they fly in, then suddenly shift to black as they reach shade from the trees; this apparent color shift may serve an anti-predator function. The starlings we netted (MM) represent the race *C. l. verreauxi*, having white on the outer two or three rectrices (Feare & Craig 1998, Fry *et al.* 2000). Some FF had feathers missing (pulled out) between the bill and the eyes, on one or both sides. A portion of FF show a half-ring of white feathers narrowly lining the eye below; also, certain FF show a few glossy blue-violet crown feathers. FF are quite heavily streaked below, and often paler on the head (buff with dark brown streaks) than illustrated in various works. The three immatures weighed 41.75–43.75 g. Soft-part colors: The bill is black (short, brownish in immatures), without yellow at the corners in MM; some FF have, others lack a yellow flange or wattle at the gape and immatures have a yellow gape wattle. The mouth lining varies somewhat. In MM it is black, but may be mottled with pinkish marks (younger MM?). In FF it is pink and yellow (corners), blotchy grayish pink with yellow at edges of bill and at rear, entirely pink, or pink with black at the edges (tomia). Possibly the mouth lining darkens, becoming more male-like, in older FF: those without a yellow flange or wattle had the most dusky or blackish. The immatures are yellow throughout the mouth (yellow gape flange also present). The eyes are usually deep brown with a yellow, narrow outer ring (the pupil often matches the deep brown of the iris, so the starling looks “big-eyed”). The yellow varies from very pale lemon to gold-yellow (even with a trace of orange); the brown of the inner iris is umber, i.e., paler in some FF. We noted orbital skin (which is very narrow) as black to brown (adults). The legs and feet may be grayish black in some FF; one F had fleshy gray pads of the toes. One June F had a brood patch; the three immatures were from May and June. One dead F in January had an ovary 10 x 8 mm (granular); this was a bright, totally black-billed adult F with several glossy crown feathers, and a rather dark mouth lining, possibly denoting an old bird.

Wattled Starling *Creatophora cinerea*

Months. All; regular July non-breeding visitor, irregularly common to absent in other months.

Ecology. Visitor, not known to breed, can arrive any time between March and June, and in smaller groups

and lesser numbers October to December. Single birds, groups, and flocks to 30 occurred December and February–March; small groups to flocks of 100 were noted January, June and October; small flocks to flocks up to 400 were seen April–May and November; and small flocks to flocks up to 2000 and more were observed in July–September over the years. Occurred every July, in most years during June and August–September, during December and April in one-third of the years, and in fewer years during other months. Usually in flocks of 8–40, or larger, occasionally in small groups or even as single birds. Flies fast and in complex formations that swirl and wheel about; only Blue-eared Glossy Starlings seem to be able to fly among them during these flights. One attacking Gabar Goshawk “broke” a flock in two, but was unsuccessful in taking a starling. Occurs in open areas, especially paddocks and pastures, but also at dams (where drinks and may bathe), airstrips, and in degraded, open bushland and woodland. Associates with other species in foraging, especially with Blue-eared Glossy Starlings, also with Superb Starlings, and occasionally with Violet-backed Starlings and a few times with Hildebrandt’s Starlings; also Chestnut Weavers, other finches, doves, and lapwings, as well as with large mammals. Sometimes hawks insects with other starlings and flycatchers, seen foraging in elephant dung and about dead elands and other lion kills. Joins in mobbing snakes and mongooses. Occurs throughout the year at nearby Lake Baringo (Stevenson 1980), where it breeds June–July.

Movements. Discussed above.

Behavior, Voice. See Feare & Craig (1998) and Fry *et al.* (2000).

Breeding. Does not breed, but fully breeding-plumaged MM have been seen April–September and December, and especially in June–July. Obvious immatures were noted June–September. Most Wattled Starlings seen were FF and mixed-plumaged MM.

Specimen data. We netted five at SI 15 April 1994, one at Kuti 4 August 1989 and one at CS 26 September 1997; these included four adult MM, two adult FF and a molting subadult M. No two were alike in coloration. The four MM weighed 62.5–68.25 g (64.6 g), with wings of three at 114.5–121 mm, while the two FF were 62 and 70 g in weight and one had wings 115.5 mm. The subadult M weighed 54.25 g. These are in the low ranges of weights and wing lengths provided by Feare & Craig (1998) and Fry *et al.* (2000). The subadult (April) and one (September) F were starting molt of the primaries, the

August M was in mid-molt, and the April F was completing primary molt. Soft-part colors: Most Wattled Starlings showed a pink-tipped bill in the field; one M had the bill entirely pale pink, the other three had black at base of the bill to nostrils, and the FF had a mottled dusky and pink-horn bill. The subadult M's bill was pink with a horn base and black about the nostrils. The MM had the mouth lining black (black rear and pink front in the subadult M); the mouth was dull pink with a gray tinge in the two FF. The eyes were brown to gray-brown. The FF were yellow in the ear coverts, and one was yellow (skin) around the orbit, reaching the corner of the bill. The subadult M showed yellow at the ear coverts (head was molting from brown to gray). All the adult MM were between breeding and non-breeding (see Fry *et al.* 2000) condition of the head, some with partial gray feathering, and all with a yellow orbit (skin) extending partly or fully to the hindcrown; one had black lores and forehead, another was similar but with a black chin and low, black forecrown wattle, a third had yellow expanded barely beyond the ear coverts, and the last was nearly fully yellow from orbit to hindcrown, with black forehead and lores losing (gray) feathering.

Yellow-billed Oxpecker *Buphagus africanus*

Months. Fairly common resident throughout the study area.

Ecology. Heard or seen over open and well-wooded areas, with various mammals, and at nesting sites in bushland, wooded grassland and woodland. Social, found in groups of three to eight (one pair plus one to six subordinate members of a group), and several groups may utilize one herd of mammals. Groups averaged about four to five individuals. Associates mainly with elands, African buffaloes, and common zebras; much less often with impalas, common wart-hogs, giraffes, black rhinos (latter two are uncommon in the area), and three seen flying low over lions likely were flushed from mammals sought as prey by the lions. We noted 15 on one bull buffalo (two flew off one that charged us!), 25 or more about *c.* 45 buffaloes, and 12 on one eland. Presumably sleeps on these mammals when not nesting, and certainly seen at night on elands and giraffes. These oxpeckers use their tail as a brace both on mammals and at nesting cavities. Flies high at times and soars in display or in search for mammalian associates. We observed one or two sunning on three occasions in the tops of trees. At least occasionally drinks in puddles; two flew off buffaloes to drink at one puddle near MB, and as

they returned to the mammals two others flew off them to the same puddle and drank. Not seen with domestic stock. Bennun & Njoroge (1999) thought it threatened regionally in E Africa.

Movements. Local only, perhaps in search of mammalian hosts or nesting sites. We observed no Red-billed Oxpeckers *B. erythrorhynchus*, readily distinguished by their lack of the pale rump patch that marks the Yellow-billed.

Behavior. Engages in conflicts while defending nesting cavity or repelling competitors such as starlings and Brown Parrots. It may also attempt to usurp cavities of such birds, and of Nubian Woodpeckers. Displays in the air: two seen to circle and touch bills (courtship feeding?) in flight; two circling high sometimes soar, wings out but not beating; a whole group may circle again and again, calling; and one may drop down to a second in a spiral to it, or may flutter its wings, coming in with the wings held in a dihedral. We have observed one calling, flying to a second oxpecker, landing on it, and fanning and lifting its tail atop the second bird. In aggression, waves the wings, holds the head forward (head and body horizontal) in a "long look," gapes at a second bird, and then attacks and chases it. Although two adults came to nests with food at the same time, feeding was generally by single adults, or by the "pair" and helpers singly; in one group of five, two were closely associated, presumably the pair, and the other three came in singly to feed when the other two were absent. These details augment information in Feare & Craig (1998) and Fry *et al.* (2000).

Voice. The well known (Feare & Craig 1998) buzzy hissing notes ("zzzz-zzzz," "zziss," and, in displays "zizz-zizz") are the common call that alerts humans to their presence. Circling, displaying adults also utter "peep-peep" notes and more chattering, "chittery" hisses. At nests we heard the young "chee-chee-chee" begging notes, melodic "cheep" notes, hollow "chok," "tok" or "kop" notes, and an ear-splitting "tchissssss," perhaps an alarm or "snake-like" sound to deter predators. These seem unreported by Maclean (1993), Feare & Craig (1998), and Fry *et al.* (2000).

Breeding. Nests cooperatively, a pair with one to six helpers, in March–September (mainly May–August); we noted indications of three nests in April and two in September, and some 36 nests May–August. Some later nests were of second broods, the birds using the same nesting cavity used earlier (they frequently employ the same cavity for nesting year after year). Fledglings were observed infrequently April–August (usu-

ally two, once three young), and appear to leave the nesting area soon after fledging. Nests were mainly in natural cavities, but some were former woodpecker cavities. Nests were at 1.5 to 15 m (mean 6 m, $n = 21$) in olive, *Acacia xanthophloea*, *A. abyssinica*, and occasionally in *Combretum molle*, *Croton* sp., and *Apodytes dimidiata* trees. Many were in split branches, the ends of broken stubs or branches, and in olive cavities that had several openings into them. One at EG was in a broken, hanging, 2-m-long branch of an *Acacia xanthophloea*, 15 m up, the branch having a c. 30 cm slit in its side that served as the entrance to the nest. We saw small twigs taken into one cavity by the oxpeckers, after the hole had been cleaned out by them. A grasshopper was fed to nestlings by one oxpecker; photographs of adults attending young showed blood and black remains of ticks or insects oozing from bills crammed with food. Older nestlings at one nest with several openings moved from place to place in the cavity and often were fed at a different opening in successive feedings. At one nest every incoming adult oxpecker was attacked by Blue-eared Glossy Starlings throughout the incubation period and into the early nestling period. Two and three fledglings were seen around six nests but for no more than one or two days after fledging.

Specimen data. Only two were netted, adults taken 11 June 1991 at SI. These weighed 65.5 and 59.75 g, and had wings 122.5 and 121.5 mm; neither was molting and the smaller oxpecker had a brood patch. Soft-part colors: From two adults just noted and photographs of nestlings and adults at nests. Red of the distal bill extends proximally farthest along the tomlia, almost reaching the level of the anterior end of the nostrils. In a bill up position adults show narrow blackish chin feathers bisecting the yellow ventral (mandible) bill, yielding a distinctive pattern. The mouth lining was pinkish red in the adults. The orbital skin is blackish in adults and dusky yellow in nestlings; often appears to have yellow orbital area, due to the narrow outer ring of the iris being yellow. The eye in fact has a narrow inner yellow ring, a very narrow outermost yellow ring and red in between. However, we observed and photographed shifts in iris color; one oxpecker showed almost no red ("yellow" iris) at one point. The yellow can shift to orange, or be so restricted as to leave the eye appearing full crimson. In nestlings the eye is brown and the bill yellow with a dusky culmen and dusky ring around the (yellow) tip of the bill with a lemon yellow gape flange.

One nestling had a generally yellow-green bill with a yellow tip. With its sooty black head and dark eyes the nestling appears very different from the attending adults.

ORIOLIDAE Orioles

Montane Oriole *Oriolus percivali*

Months. May–August; casual visitor, records 1986, 1990, 1992 only.

Notes. There was an influx of large numbers in the Mukutan River area (MK, EG, original camp 1 km from the river) during late July and early August 1986. This is the period in which the first rectrix of the tail (black in *percivali*, greenish in *O. larvatus*) is molted in the Black-headed Oriole, and we were careful to observe the tail, and other features (black of wings greater, blacker tertials, and greater wing coverts) of the Montane Oriole. There were more orioles about this area than we have seen before or since, and the two species interacted, affording close comparisons. They may have been attracted to fruiting olives, which some were seen eating. One singing was chased by a Black-headed Oriole, and returned the attack, with tail spread. Five at our old camp interacted, bowing, spreading and "cawling" the wings (wings out, flight feathers pointing downwards), with back and forth chasing and calling, all the time with tails spread. Calls/songs very like those of the Black-headed Oriole, tending to be more hollow and ringing. Some songs were: "kee-kow, k'yowk," "ter-wa-ta-wa-tle," "te-vay-oh" or "te-vee-oh," "ken-te-vay-oh" or "ken-ta-vee-oh," "tee-wee-oh," "yew-tyew-TYEE-wa," "cew-pyew-tyeoooo," and "weech-ew." Calls were a fast, hollow "p'yecowk" or "p'yowk." These closely resemble "songs" shown by Dowsett-Lemaire (1990, Fig. 12 c-e; see also Fry *et al.* 2000). An apparent pair uttered these: A) "te-vay-oh," and B) "wee-ow" to "wee-chew." Also observed: 18 June 1990, at EG, an apparent pair perched in an *Acacia xanthophloea* under a singing Black-headed Oriole; 20 May 1992 at NG, four adults interacting with two Black-headed Orioles, spreading tails and whistle-calling "p'yowk" (*vs* "pee-yew" of Black-headed), with chases; and one adult observed closely at EG 1 July 1992, on the ground seizing one termite after another (tail full, with black central rectrices). These occurrences suggest occasional movements of Montane Orioles, perhaps associated with their displacement by ongoing clearing of the once extensive highland forests of Marmanet and Ol Arabel areas just S of the study area, toward Nyahu-

ruru. Widely known as the "Montane" Oriole (Britton 1980, van Perlo 1995, Zimmerman *et al.* 1996), we see no reason for the shift by Fry *et al.* (2000) to "Mountain" Oriole for this species.

Black-headed Oriole *Oriolus larvatus*

Months. Common resident in all wooded habitats, and at all our study sites.

Ecology. Occurs in all woodlands and edges of woods and forests, ranging into bushland with some trees, and wooded grassland; also forages occasionally in very open situations along roads, in bushed grassland and in pastures. We have c. two dozen records of foraging on the ground (once in elephant dung), and within 1 m of the ground (as from lower rungs of fences into grass); two foraged with Superb Starlings and Brown Babblers on a lawn, and another foraged with five Crested Francolins, four Rueppell's Long-tailed Glossy Starlings and 10 Black-lored Babblers on and just above the ground in an open area at SI. An opportunistic feeder, it drop-catches insects from a perch or in flight low over the ground, gleans insects at flowering trees (*Croton* sp.), flycatches from a perch, hawks termites aerially at times, and gleans and probes the bark, lichens and mosses as it works over tree trunks and branches. Also eats beeswax occasionally (at our feeders), takes lizards as prey, can sing with two caterpillars hanging out its bill, and takes fruits of *Carissa edulis*, *Strychnos henningsii*, *Ficus* spp., and olives. Joins mixed-species foraging flocks with diverse species of birds (17 species in one such flock), but especially with African Drongos, cuckoo-shrikes, various warblers, bulbuls, tits, and others. Sings in trees, once four at once, and drinks occasionally at puddles, streams and bird baths. Scratches its foreparts indirectly. Mobs or chases various birds of prey, especially owls, and also snakes. Drongos, cuckoo-shrikes, helmetshrikes, various flycatchers and tits most frequently join them in mobbing predators. This widespread oriole is often found in pairs that seem not to occupy a year-round territory. Up to 10 or more may gather at fruiting plants. In suboptimal habitats, as bushland without trees, may leave the area during droughts, when numbers along the Mukutan River and tributaries, and at Nglesha, may be augmented by orioles from drier sites.

Movements. Covered above.

Behavior. Well known generally (van Someren 1956, Fry *et al.* 2000). Engages in conflicts with various flycatchers, drongos and Blue-eared Glossy Starlings. Two attacked Broad-billed Rollers at their cavity nest,

one oriole dropped from the air to hit and chase a singing warbler, and another chased a serin. An oriole supplanted a singing Scaly-throated Honeyguide on two different occasions; we observed no fewer than five Lesser Honeyguides chasing a Black-headed Oriole, and an oriole was chased by an immature Greater Honeyguide. A Tropical Boubou, a nest predator of the oriole (Fry *et al.* 2000), chased an oriole that probably had attacked the shrike. Displays include spreading and closing of the tail (usually spread when singing), spreading and swinging of the wings and bowing. Two fanned and spread their tails at one another before a third, onlooking adult.

Voice. The common call is a variable "pew" or "tew" to "i'eeoh," "tee-voo" or "pee-eroh;" the "pew" can be used aggressively, and is also commonly uttered when a netted oriole is released. The alarm "kaar" or "kwaar" was illustrated sonographically by Maclean (1993). A juvenile gave a "kwe-kewp" call. Songs are very variable, many of the variants being whistled, 3–4-note phrases (that are readily mimicked by humans). We render some of the songs we have heard: (1) "wee-wee-oh" or "cher-wee-oh;" (2) "weep-oor-weel;" (3) "tee-ew-pop" to "feew-kok" or "co-will-oop," or "keeyew-yuke;" (4) "hik-pa-poo-tle" or "wee-ple, poo-del;" (5) "ter-ker-tootle;" (6) "peeoh-popple" to "la-pyowp;" (7) "wee-keetle, konk;" (8) "tchok-oo-klot" to "tchew-kew-kot;" (9) "chee-oo, cheetle;" (10) "wee-tle, yote;" (11) "chip-pee-oh;" (12) "cha-ka, tchew-koo;" and (13) "wee-pa-wee-ool." There are variations within these as to the note which is emphasized. In our experience duetting (Fry *et al.* 2000) is not the rule, and indeed one song form is often copied by neighboring orioles, such that five or six singing orioles may use the same song for a brief period. Van Someren (1956), Liversidge (1991), Maclean (1993), Zimmerman *et al.* (1996), and Stevenson & Fanshawe (2001) did not mention duetting. An apparent pair sang identical "tee-kwee-tle" songs 21 July 1991, as a pair in the adjacent tree both sang "wit-tee-wee-oh;" one of the former then switched to the latter song. Duetting seemed not to be involved. Singing peaks in May–July, with a lesser peak in December–January or –February; low periods of singing occur in March and October–November (we used frequency of singing, number of days in which songs were heard, and proportion of days per month singing was heard at camp as three parameters, all yielding similar results). However, songs can be heard in any month of the year. This is not a particularly early or late singer, and is not heard at night. At camp we recorded the earliest songs

at 06:00 h in May, and songs earlier than 06:15 h only in May–June and December–January; otherwise the first songs often were after 06:25 or 06:30 h. The latest songs noted were at 19:00 h in January and 19:04 h in February (18:50–18:59 h in April–August), whereas this oriole usually did not sing in camp after 18:25–18:35 h. Subsong, often more extensive than is the song, involves warbled, longer song with mimicry of other species, including songs and calls of several starlings, White-rumped Helmetshrikes, and human whistling. Its function is not clear, but subadults use subsong, and do not respond to playback of song and subsong – adults respond by calling, spreading the tail and raising their wings. Muted songs also are uttered by adults with brownish, non-breeding bill color. Fledged young call “pip” and “pyip-ip.” They may spread the tail when begging.

Breeding. Breeding primarily occurs April–September (nests April–July, fledglings April–August, cloacal protuberance, and brood patch data May–September, copulation in May), but one nest in February and immatures December–February indicate occasional breeding after the little rains of October–November. It is likely that two broods are raised. Subadults, with partly or mainly adult wings and tail, but having some throat-breast streaking, are known from April–June (four), August–October (five), and December–February (eight); we surmise that these result from breeding 4–5 months earlier. Of 71 immatures, 60 date from April–October and 11 from December–February. It is clear that the July–August rains following the big rains of April–May provide an extended breeding period in this area of three rainy seasons; Brown & Britton (1980) and Fry *et al.* (2000) had breeding peaks, but for areas with two rainy seasons (March–May, October–November) in April–May and October–November. Nests are very difficult to locate as they are often high in dense foliage of trees. Five nests at 3 to over 12 m (mean 8.2 m) likely were lower than most, as we simply could not see nests in tops of *Acacia abyssinica*, *A. xanthophloea*, and *Croton* spp. The five nests noted were in *Croton* spp. (two), *Acacia abyssinica* (one) and tall (12–14 m, two) *Euclea divinorum* trees. Nests were of fibers, rootlets, grasses, and much *Usnea* sp. (“Spanish moss”) and lichen that covered, obscured, and camouflaged these (and other) nests. Fledglings numbered only one or two; nests seemed to contain two or sometimes only one nestling. As noted by Rudnai (1994) and Fry *et al.* (2000), adults coming to feed nestlings utter a 3-noted (“yow-chee-yowp”) call, but in the cases above switched to a

“pec-o” call as they neared the nest. As the young gain independence they seem to join other immatures, and move about, foraging together in a loose group.

Specimen data. We netted 83 Black-headed Orioles, and found one recently dead adult (wing measurable); an immature at EG 18 August 1987 dropped from a tree in front of us at 06:45 h, and died within 15 min! Three orioles banded as adults (thus more than a year old) were netted 13 months later, 55 months later, and 68 months later; the last must have been at least seven years old. Non-molting adults were in September–May and (two birds) June. Adults commencing molt of the primaries were in April to July, those in the late stages (ending) of molt were from late June to December, and individuals approximately in mid-molt (mid-way through primaries, tail molt under way) were in May–August, with one in December. The annual molt seems to begin early to near the middle of the breeding season, with completion in July–December. Weights of 44 adults were 49–66 g (58.05 g); six MM weighed 57.5–60 g (58.6 g) and seven sexable FF weighed 55–66 g (60.8 g, the 66 g represented a laying F). Only 29 adults could be measured for wing length; these were at 123–137 mm (130.73 mm), with six MM at 129–135.5 mm (132.1 mm), and six FF at 123–131.5 mm (127.0 mm). Wing length places these between *O. l. angolensis* and *O. l. rolleti*, but nearer the latter. However, some individuals are rather greener-backed and yellower, less golden in tone than is usual in *rolleti*, and orioles of the study area may be tending toward *angolensis* to the S and W (see Fry *et al.* 2000; however Chapin 1954 placed *angolensis* in Kenya and *rolleti* to the N). Of the non-adults, 15 immatures weighed 52–62.25 g (56.2 g) and 10 subadults were 52–65.5 g (57.0 g). Thus non-laying FF probably are lighter and shorter-winged than MM, and young birds are slightly lighter (two subadults with relatively little worn but immature wings measured 121 and 122 mm). Soft-part colors: Late in the study we noted that adults had yellow skin on the head, throat and upper back, whereas it was flesh-pink elsewhere on the body. The bill varies greatly in color among adults. The bill was pink, rose-pink, rosy red or red, often with a dusky or horn tip; in several the bill was brownish pink. Young birds have the bill blackish or dusky or pinkish with brown patches, or black with a pink tinge; the gape area of fledglings is pink, without a wattle (Fry *et al.* 2000). The mouth lining is pale pink to pink in immatures, and usually darker pink (rosy) in adults, but was yellow-pink in one F. The tongue tip is

forked. Orbital skin is blackish; immatures have an olive ring of feathers around the orbit. The iris usually is crimson, red or red with an outer ring of pink in most adults, but sometimes shows a brown-red tinge (in full adults). In immatures the eye is brown or chestnut, often with a red outer ring, or is orange-brown. Subadults vary from the immature color to fully red (in older subadults). Legs and feet are gray-black to blackish in adults, and grayer, even pale gray in young birds, which have pink-orange toe pads. Fledglings have a scaly belly.

African Golden Oriole *Oriolus auratus*

Months. May–September; rare non-breeding visitor in five years, most in 1990.

Ecology. Visitor to six sites and two other locations, one record each in 1986, 1987 and 1989, two records in 1992, and 17 in 1990, all between 23 May and 12 September. This period coincides with the timing of visits known for the southern African *O. a. notatus* (Harrison *et al.* 1997, Fry *et al.* 2000). Mostly seen in tall trees, but two fed with a flock of Blue-eared Glossy Starlings in scattered low trees W of Saddle Boma 19 July 1990. A F fed with a flock including cuckooshrikes, paradise monarchs and bulbuls 23 May 1990 at MB. Immatures and adults were seen hawking termites several times in June 1990. An immature mobbed a Gray-headed Bush-shrike with drongos and bulbuls at MB. Of *c.* 32 observed (several possibly the same bird on different dates), 17 were FF and 11 were immature-subadult, and only four were adult MM. The sightings were at elevations of 1737–1970 m; only two of eight sites at which they occurred are below the 1800 m upper limit given by Lewis & Pomeroy (1989).

Voice. Subsongs with some warbled notes were heard from subadults 2 June 1990 and 1 July 1990.

Breeding. Does not breed, but noteworthy is the occurrence of immatures only May–4 July.

Specimen data. We netted an immature-plumaged African Golden Oriole at MB 11 June 1990. Immatures varied considerably, but were distinguished in the field from adult FF by the narrower, gray eye-line, and, in MM, the strongly (most individuals) streaked underparts and yellow color above. We judged the bird to be an immature M on the basis of heavy ventral streaks (although those were on a cream-colored, not yellow background). It weighed 78.5 g, and its wings were 136 g (wings were immature). It had a larger grayish area around the lores and under the front of the eye, the eye-line being narrower behind the eye;

yellowish orbital feathers were under and over the eye. It was almost gold above, brightest (yellow) on forehead and rump (the underwing coverts were bright gold-yellow). The wing lesser coverts were yellow (feathers brown in center) and the greater coverts were tipped yellow. The tail was olive (rectrix one brown and very worn), with much yellow on the inner vanes to the tips. The ear coverts and sides of the neck were gold-yellow, sides yellow, and chin very pale yellow, but rest of the underparts from throat to belly were creamy white; the fine brown-black throat streaks graded into heavier breast streaks, then finer but long blackish streaks onto the belly. Soft-part colors: The bill was blackish with pink inside the nostril; the mouth was bright pink with pink visible at the gape of the closed bill, but there was no flange. The eyes were brown with a very fine (narrow) outer ring of the iris whitish gray. There was a narrow black orbital ring. The legs were gray.

Golden Oriole *Oriolus oriolus*

Months. October–December, April; rare migrant from Europe, noted in five years.

Ecology. Recorded twice in April 1993 (five with a mixed-species foraging flock 3 April, one M at Center 23 April), but mainly in October (nine birds, six dates in three years) and November (four birds, four days in 1985), with one first-year Golden Oriole netted at MB 20 December 1988. Generally seen in canopy of trees, but two drank on the ground at Lugwagippe Dam 2 October 1987, and seen flycatching for termites from a few trees in bushed grassland above UL 18 October 1992 (three MM, one F).

Specimen data. We netted four FF (three between 30 October and 10 November 1985, one on 22 October 1987) and one first-year bird 20 December 1988 (at MB). The four FF weighed 58–66 g (62.6 g) and measured 140–147 mm (143.9 mm) in wing length; the heavily ventrally streaked first-year bird (F?) weighed 76.75 g and had wings at 145 mm. The last individual had red-brown eyes and a dull blackish bill, the latter a F trait (Cramp & Perrins 1993), and fine yellow edges of the median and greater coverts (Svensson 1992, see also Jenni & Winkler 1994: 153).

We are uncertain why we netted five of this oriole, and only one of the more frequently observed African Golden Oriole (Lewis & Pomeroy consider Golden Oriole more common inland than African Golden, but we note that Olson *et al.*, undated MS, found the African Golden more common E of us at Mutara,

where but one Golden Oriole was noted). Possibly the Golden Oriole feeds more diversely and at lower heights. Our records of the Golden Oriole are within the usual times of occurrence of this species on migration in Kenya (Lewis & Pomeroy 1989), and the preponderance of records in the boreal autumn (southward migration) compared with but two "spring" records also agrees with its known pattern of migration (Cramp & Perrins 1993: 418).

CORVIDAE Crows, ravens

Pied Crow *Corvus albus*

Months. All but March, May, November; occasional visitor from S, especially June–July.

Notes. Common about Kinamba and not uncommon in the cultivated area S of the study area, and sporadic visitor to sites (especially about Nglesha, where it could breed, and at Center) in the S half of the study area. Never more than six observed at once, usually seen as a pair, in open, pasture areas, at feeding pens about habitation, about dams, and flying over other areas. Twice seen at NG, chasing, and badgering a Martial Eagle. Also at NG, four and two seen on separate occasions about cattle with Fan-tailed Ravens also in attendance. Calls attention to itself by calling as it flies, a "kraaa" or "kaar" (see Goodwin 1986, Madge & Burn 1994). Calling, displaying birds seen at NG during July; six overflew, calling, from S to N, breaking into pairs, then veering back together; and two pairs chased each other, bounding about a tall tree there. Supposedly breeds in our region during October–November (Brown & Britton 1980), but they had few or no records from our triple-rainy-season subregion; Fry *et al.* (2000) gave January–March and September–December as periods of breeding.

Fan-tailed Raven *Corvus rhipidurus*

Months. C. four pairs work through the area from the W escarpment.

Ecology. Usually seen (and heard) in pairs, maximum observed seven. Can be observed at any site, but uncommonly in the E (NP-FS-OD-KS); regularly to 2000 m and more (Lewis & Pomeroy 1989 noted most are below 1500 m). Frequents human habitations, settlements (as just outside the study area by TA and LU), sheds at which meat is treated, nearby pastures, the vicinity of cattle, warthogs, kongonis, kills of lions, and leopards, (or cheetahs), rubbish tips, and may circle and follow humans and lions. Circles with vultures at times. Often observed flying W to E, and back again over MK site, passing from the Mukutan Gorge

and Laikipia Escarpment toward the rubbish tip (where carcasses are dumped) or Center. A pair danced about taking termites W of Kuti 5 July 1992. There is little information about its habits in Africa (Goodwin 1986, Madge & Burn 1994, Fry *et al.* 2000).

Movements. Only local; could conceivably come up from Lake Baringo (where common, Stevenson 1980) to forage in study area, but only one pair flew up and down the Mukutan River; birds to N (TA, PK) and S (NG) also fly E-W in pairs, and more likely come from the escarpment nearby, rather than 25–30 km from Baringo. No large groups or flocks were observed.

Behavior. Sometimes chases and attacks birds of prey, e.g., Tawny Eagles (three instances), and an immature Pallid Harrier (once). Probably engages in flight displays; pair circled in stilted flight, turning, twisting, flying in parallel and only calling as they flew away, over MK 30 October 1985. A pair seemed to come "to us" at KS, landing nearby (the only occasion at this wooded site), 22 December 1994. After watching for a few min, one flew S, calling ("krraw" call); the second raven remained, uttered the same call, but *sotto voce*, 10 times, rapidly, in a horizontal posture, then preened, and thereafter called loudly four times and flew S after the first bird (both later soared over us with vultures).

Voice. Known to be variable (Madge & Burn 1994, Fry *et al.* 2000), usually high- to lower-pitched "kraw" or "kaaar." One of four (feeding with a Woolly-necked Stork and vultures on a dead buffalo carcass) flew above the group, circled, and called "wook-wook-wook" several times. We have not heard the "song" (Madge & Burn 1994), but only uttered near the nesting site, not near us.

Breeding. Our evidence for breeding nearby consists of adults carrying food from E to W down the Mukutan River (toward the Gorge) in early February 1987, and occurrence of trios, one less glossy than the other two, only in February (once), May–July (11 times), and December (once). Madge & Burn (1994) reported eggs laid during June in N Kenya, and February, March and May–June in Ethiopia; Fry *et al.* (2000) gave January–June for breeding in Kenya, which is what Stevenson (1980) noted for Baringo Fan-tailed Ravens (Cramp & Perrins 1994a ascribed breeding in East Africa to April–June). Our records for trios and the February carrying of food fit within the January–June nesting scheme. Also, Cramp & Perrins (1994a) noted that this raven molts June- or July–December throughout its range, presumably

post-breeding (or from late in the breeding season onward). We observed flying Fan-tailed Ravens in wing molt during July and August. Young ravens raised in nests along the escarpment likely take two months or more from hatching until they can make more or less sustained flights of c. 5 km or more with their parents, so our data suggest laying mainly January–March or -April (see Cramp & Perrins 1994a for development after hatching).

DICRURIDAE Drongos

Common/African/Fork-tailed Drongo *Dicrurus adsimilis*

Months. Common resident throughout the area.

Ecology. One of the area's commonest birds by virtue of the diversity of habitats occupied: in bushland, woodland, degraded bushland and woodland, riverine woods, bushed and wooded grassland, roads and roadsides, gardens, cattle dips, about houses, in bomas, and forages far over water and open pasture (especially where fences are present). We have never seen it within the dense forest patch at Nglesha (is in Liberian forests, Gatter 1997). It forages for insects, hovering before flowers (jacarandas, *Apodytes dimidiata*), drop-feeding from very low to high perches, sallying, hawking as swallows do, and hopping and even walking on the ground (about puddles, at emergences of ants and termites). Checks old nests for insects, pirates insects from smaller birds (tits, also Pallid Flycatchers), hawks over dung, takes bees about hives, and flycatches from perches about vultures resting in large trees (is this an "association"?). We watched one follow a Hoopoe that was hunting grasshoppers; the drongo pirated grasshoppers from its bill or seized them as flushed, but when the Hoopoe ceased that form of feeding and shifted to probing the ground, the drongo left. Flycatches up to 35 m into the air from low perches, and hawks higher when "swallow-foraging." It is active well before dawn (often seen about or on roads in dark), and after dusk at times. Its many "associations" include mixed-species foraging flocks, following of walking humans (once for 1 h), and hawking alongside a slow-moving vehicle in bushland (two for 15 minutes). In mixed-species foraging flocks joins with up to 18 species in one flock, and over 50 species of other birds in 61 flocks that we watched for any period of time (it is difficult to note every species in loose flocks). These especially include: Starlings, even oxpeckers about large mammals, "flycatchers" (of genera *Bradornis*, *Batis*, *Melaenornis*, *Prodotiscus*, *In-*

dicator, *Prionops*, *Eurocephalus*, and cuckooshrikes and orioles), finches (*Uraeginthus* spp., weavers, and serins spp.), bark-foragers (three species of woodpeckers and wood-hoopoe), small insectivores (species of *Camaroptera*, *Sylvietta*, *Cisticola*, *Zosterops*, and Variable Sunbird), bush-shrikes (puffbacks, tchagras, Sulphur-breasted), Common Bulbuls, Plain-backed Pipits, and others (Crowned Hornbill, Brown Babblers, several thrushes, etc.). Some of these may be "used" to disturb insects that the agile drongo can snatch, particularly the terrestrial and bark-foraging birds. Also feeds above or in front of large terrestrial birds in groups, especially guineafowl, storks, several francolins, and grazing Egyptian Geese. At fruiting fig trees darts around taking insects flushed by visiting frugivores, and insects about rotten fruits on the ground. Also associates with large and medium mammals (Fry *et al.* 2000), taking insects about their legs and in front of them; in the area 12 species of mammals were utilized, most frequently impalas, zebras, elands, warthogs, buffalos, and elephants (including several bathing elephants!), and also waterbucks, kongoni, domestic donkeys, cattle, and once a party of dwarf mongooses. Sometimes remains with herds of game even when the latter run some distance. One among three foraging in darkness of late pre-dawn was lying in the road as if a nightjar, perhaps gaining warmth from the soil. Drongos join other birds at the meat shed, flycatching for insects attracted to hanging meat, rather than eating meat. We have seen no instance of predation by drongos on birds or their eggs. Drinks occasionally, in flight, by dipping into the water (dams, bird baths), and bathes by splash-bathing on the wing, much in the manner of paradise monarch.

Movements. Apparently none other than dispersal. Forages in open areas well away from territories. Up to six pairs can occur about GMF camp in the breeding season, whereas one or two pairs were noted in dry times of the year (territories may contract and expand in different directions).

Behavior. Somewhat well known (Fry *et al.* 2000). Displays include bowing, flipping or raising wings, and aerial displays with up-down elements, swooping, and diving. Once two flew high in different directions, one swept down in a circle, and the other dove to it, calling all the time. In another display, the bird flew up and dropped down (40–50 m up-down) four consecutive times, loosely in a circle. Chases and aggression are common; one drongo attacking another clung to it upside-down as the attacked bird flew, then dived to near the ground (they were "attached" for

c. 20 s). There also are play-chases, not involving serious attacks. Since interactions were common, it was difficult to detect (in the brief time we had) pair interactions from non-aggressive intra-pair and intra-family interactions. Adults seemed to drive young birds (not red-eyed) away from territories in September–October. The three-to-five bird interactions thereafter seemed to involve adults. Drongos are well known as among the most aggressive of birds (Maclean 1993, Fry *et al.* 2000). Some aggression observed with certain other birds likely involved prior interactions, aggression by or toward the drongo previously. One drongo drove two Broad-billed Rollers to the ground. Difficult to understand are drongo attacks on and chases of a serin, a nightjar, and a Hamerkop; these could have been attacked simply because they flew near a drongo. We saw four attacks on four cuckoo species, only one of which (African Cuckoo) is a brood parasite of this drongo (Fry *et al.* 2000). Mobbing and attacks/chases involving predators are engaged in frequently. We had 43 fully and continuously observed occasions of this type. Of these, 13 attacks/chases were against Gabar Goshawks, and 15 against African Little Sparrowhawks (five), Crowned Hornbills (five) and both chanting goshawks, these accounting for 65% of the attacks. One attack on a Dark Chanting Goshawk carrying a Crested Francolin caused the hawk to drop (and lose) its prey in an acacia. Surprisingly, only four attacks or mobbings were against owls, mainly Verreaux's Eagle-owl, and but once against the Pearl-spotted Owlet. Other birds mobbed were: Brown Snake-eagle, Tawny Eagle, harrier-hawk, African Hawk-eagle, Wahlberg's Eagle, a Pallid Harrier, a Fan-tailed Raven, and the nest predators (along with Crowned Hornbills) Blue-eared Glossy Starling (four times, several times with other mobbing birds) and Gray-headed Bush-shrike. Only once seen to mob an unidentified snake. Of all of these species it commonly mimics vocally only the Gabar Goshawk (and/or Diederik's Cuckoo) and Blue-eared Glossy Starling (see below).

Voice. Intricate duetting of the Common Drongo was shown by Helversen & Wickler (1971) and Helversen (1980), based upon a two-week study in the Serengeti in January 1969. Neither they, nor others (e.g., Zimmerman *et al.* 1996, Fry *et al.* 2000) who mentioned its duetting gave an indication of the circumstances of duetting, and competent observers such as Chapin (1954), Liversidge (1991), and Maclean (1993) failed to mention its duetting. Inasmuch as Helversen & Wickler (1971) reported these duets as

lasting 4–5 min, it is odd that they escape attention. We observed duetting very sporadically – without close attention it was difficult to ascertain duetting when three or four adults were singing and interacting. Our many evenings and mornings, especially at GMF, showed that its so-called “dawn song” (which we have heard during the day) is largely individual (little or no duetting) and results in countersinging of drongos, presumably MM, at a distance from one another. Except mimicry and subsong, its songs consist of short notes, often call-notes (“dawn” song starts with such), that are put together in different combinations, as indeed are the duet songs (see Helversen 1980). Several times, when two birds “sang” close together in the pre-dawn, one would utter “skreep,” and the second a “screep-eep,” hardly a duet. Basic notes of songs consisted of these: “skreep,” “cheet,” “chup,” “chee,” “cher,” “preet,” “weep,” “churt,” and “tziing.” Countersinging drongos often shifted phrases over time. On 3 May 1995 at 05:09 h one sang “heep-eep-eep,” and the second an “eep-eep-eep-eep;” at 05:15 h, bird 1 was giving “peep-fizip-fizip-fizip” and 2 sang “cheep-chirp-chirp-chirp” (at times they varied these by adding or dropping one or two of the second type of note in each song); by 05:40 h, still fully dark, 1 gave “preet-preet-preet-preet-chur” as its song, the 2nd was silent. Generally songs became longer as dawn (c. 06:00 hrs) approached, with up to 12 notes given in a song, though most songs contained three to seven notes by that time. Some examples of dawn songs are: “heep-de-heep” or “weep-da-weep” or “heep, see-heep” (this version was common); “chup-wee-wur” or “wup-fleep-fleep” or “wurt-cheep-cheep,” all by one individual; “woh-deecept-deecept;” “cheep, cheep-yewp;” “skreep-skreep, tee-chur, tee-chur;” “skeeshree-skeet;” “eep-cheep-zeej;” “k'deep, k'deep, k'deep, tree-chur;” “kreee-eee-eeek-eek-eek” (to 12 notes); and, “chu-cheep, chu-cheep, chu-chu-chu, cheep-cheep-cheep-cheep-chup.” None of these was so long, or involved so many note forms (20!), as in the example of Zimmerman *et al.* (1996: 623). These, and like songs, tending to be longer and more often double-noted (as “tseep-seep,” “skree-skreep,” “cheep-cha,” “zweet-tziing,” “shweek-yewp,” etc.), marked the diurnal songs, some of which went on for 2–3 min. Evening songs were like pre-dawn songs, except with fewer notes on average, and the nocturnal (20:00–04:00 h) songs resembled these as well. Diurnal songs also include extended subsongs, with whistles, warbles, squeaks, twitters, mimicry (of Gabar Goshawk or Diederik's Cuckoo, Blue-eared Glossy and Violet-

backed starlings, both M and F songs of Red-faced Sylvieta, paradise monarch, Pallid Flycatcher, Red-headed Weaver, White-rumped Helmetshrike, the chatter call of Brown-capped Tchagra, and song of the Buff-crested Bustard), with the goshawk (or cuckoo) being by far the most frequent. That it might be the cuckoo rather than the goshawk at times was indicated by a drongo chasing a singing M Diederik's Cuckoo, and within 1 h mimicking the full cuckoo's song. Subsong is used in courtship, but can also be heard from several individuals when several adults are about; we have heard immatures mimicking the Gabar call (an immature, as well as one adult, sang while held in a net bag!). Songs can be delivered with the bill held open, and uttered in flight. Twitters and "chip" calls mark some flight displays (see Behavior above).

We categorized GMF songs into: A) simple song episodes combined with episodes of nocturnal songs, pre-dawn (05:00–06:00 h) and post-dusk (18:50–19:30 h) songs, warbled and other subsongs, and extensive diurnal singing events; and B) the "complex" songs or episodes of (A), apart from simple songs. Of 663 total episodes, 47% were given April–June, 27% in July–October, and 19% in November–March, whereas "complex" songs, of which there were 342 episodes, occurred in April–June as 62%, July–October as 19%, and November–March as 19%, of their total. As for singing itself at GMF, we tabulated 462 of 818 days in which Common Drogos sang: 68% of these days were in March–July, 13% were in August–November, and 19% in December–February. Finally, we categorized all dusk to dawn singing at all sites, 203 episodes, into pre-dawn song (05:00–05:59 h), "dusk" song (18:50–19:30 h), and nocturnal song, between the others. Our results showed that all 11 "nocturnal" singing episodes were in April–July, only 13 (of 33, 39%) of dusk songs were in April–July, but 120 of 159 "dawn" songs (75%) were in April–July (combining all 3 categories, 69% were in April–July, 10% were in August–November and 21% were in December–March). We suggest that these data show singing all year, but a build-up December–March, to a peak in April–July and less song thereafter. The suggestion of more dusk singing December–March than April–July could relate to songs at that time being especially important for establishment of a breeding territory prior to the onset of breeding (see below).

Begging notes of fledglings are musical, piping and "peet" notes. In hand, birds gave "pee-ew" or "weee" calls. Call notes are difficult to separate from notes

of songs, but tend to be squawky, or as we termed them, "skreepy" ("zhreep," "skreep," "krecek"). We present these data and transcriptions, gained casually as we could spare time from honeyguide work, in hopes of stimulating further research on the voice of this drongo; it may vary vocally in geographic or other patterns of variation.

Breeding. Fry *et al.* (2000: 59) gave breeding in Brown & Britton's (1980) Region D (including our study area, but without data from the triple-rainy-season subregion) as "mainly in short rains," or the little rains of October–November. Brown & Britton had six March–June breeding records, three in April (big rains), and nine September–December records, six of them in November. As suggested by the pattern of singing given under Voice above, drogonos of our area breed from the big rains through the July–August rains, and not thereafter. Although we found only one nest (with three older nestlings) in May, we saw 23 instances of one to three fledglings being fed by parent drogonos in April–October, with but one instance in each of August, September, and October, thus 20 cases plus the nest in April–July. Nesting then seems to occur late March–August, with re-nesting or second broods occasionally until September. Independent immatures ($n = 12$) were observed only in June–September, thus agreeing with a March- or April–July or -August breeding season. Six subadults, which are older immatures of Fry *et al.* (2000), with essentially adult plumage, but brown juvenal flight feathers (their eyes vary from juvenile to near adult, and they show pale and dark barring of the undertail coverts), date from November–February. These indicate that the flight feathers of juveniles are not molted for at least five and more likely up to 10 or more months after hatching, in their first full, annual molt. The only netted adults with a brood patch or cloacal protuberance were from May. The only molting adults we netted were in June, July, and (completing molt) November, and the annual molt thus extends from the latter part of the breeding season to the non-breeding period thereafter (but a July adult and some from September, October and December, as well as January, February, April and May were not in molt).

One nest at CS was 5.5 m in a *Euclea divinorum*, on a bare inner branch between the base of a tiny branchlet and the small main branch; saucer-shaped and well-bound to the branchlets by spider webbing, it was of fibers, rootlets, tendrils and very fine twiglets, all woven with spider webs. It contained three large nestlings in juvenal plumage (Fry *et al.* 2000),

being fed by the two adults. The only nest found, it was along game trail to our nets in bushed woodland. The fledglings seen numbered two, or one, or, once, three. A recently fledged drongo (dark eye, gold-yellow gape area, brown mainly, with spots in the wings and scaly barring below), begging, had one parent approach bearing a larva that the adult ate; the youngster flew to an adjacent tree and was fed by the second parent. Immatures, even fledglings with no parent nearby, and subadults, are doubtless more numerous than our records indicate as we did not check every drongo seen. The feathered nestlings had their dark eyes open, appeared generally sooty with pale speckling and some barring visible as they moved wings and body (downy tufts of feathers were seen here and there on the upperparts). We had excellent views of the head and large-appearing bill, which was mainly yellow (Fry *et al.* 2000 stated it is black), broadly so at its tip and with large yellow areas along mandibular and maxillary tomia – dusky or blackish was visible narrowly on the upper sides and culmen, and about the nostrils. The gape flange was yellow, and when the bill was held open, the yellow of the bill and flange contrasted with the pinker mouth lining.

Specimen data. We netted 13 adults, one immature, and four subadults (latter described above) or older immatures (Fry *et al.* 2000). Unfortunately we did not check the mouth lining of birds generally until after a visit by Prof. Dr. Fritz Merkel, the starling expert, but sexed two MM by cloacal protuberance, and four FF based upon brood patch indications. The 13 adults (from all months except March) weighed 31.5–41 g (35.02 g); two MM among them were 37.75 and 41 g, and four FF were 31.5–40.25 g (34.1 g). Wings were measurable for nine adults: 117.5–124 mm (120.9 mm), with two MM at 122 and 124 mm, and two FF at 117.5 and 120 mm. FF appear to weigh and measure less than MM. Only two of 13 adults weighed were within the range of seven Kenyan MF reported by Fry *et al.* (2000), with a mean of 43.4 g and range 39–54 g. Their wing measurements were considerably greater than ours, but we are uncertain of their places and seasons of collection. Subspecies are weakly characterized, depending upon a single character, projection of the forked tail tips, but probably represent *D. a. fugax* (*D. a. divaricatus* occurs in N Kenya; our birds seem smaller than both insofar as Fry *et al.* 2000 provided data, but these races are not easily separated (Friedmann 1937, Chapin 1954, Mackworth-Praed & Grant 1960, and White 1962).

The immature was 28.5 g, and the four subadults weighed 30.5–31.5 g (31.1 g); two of the latter had (juvenile) wings at 109.5 and 115 mm. One adult was netted above a beeswax feeder on which it had been hawking insects attracted to the wax. All adults showed a dull buffy “silver” wing patch that characterizes this drongo. Several adults showed slight whitish barring in the undertail coverts (all subadults did so); one in very fresh plumage had white tips to the primaries and undertail covert feathers. Soft-part colors: The bill is black in adults and subadults/immatures, but yellow and dusky in nestlings. Recent fledglings show a yellow flange at the gape corners. The mouth lining was black in two MM, black in a likely M, pinkish yellow in two FF, pink suffused with blackish centrally and at tomial edges in another adult (F?, possibly old F), and pink-yellow and yellow in two other adults. Researchers handling drongos should check the mouth lining, as there seems to be a sexual color difference. The immature described above had a yellow-pink mouth lining, as did two subadults (others not checked). There is a possible difference in eye color between the sexes, crimson to ruby red perhaps in MM and orangey red in FF (this needs confirmation, older FF may show M color); one adult had a crimson iris with a narrow orange outer ring (F, or young adult?). The eyes were brown in the immature; eyes of subadults, which varied in plumage, were brown-red, reddish, brown-orange, and orange with a buff outer ring. The legs of those checked were black or gray-black with pads of the toes gray. We had no retraps of the birds we netted, attesting to the superb eyesight and agility of Common Drongos.

Note on English vernacular name. We employ “Common” as the English vernacular name, partly because it is common and widespread, because there are several “African” Drongos, and, finally, because “Fork-tailed”, used in southern Africa and by Fry *et al.* (2000), is simply inappropriate, since most drongos are fork-tailed, and even the “Square-tailed” Drongo *D. ludwigii* has fork-tailed races! A forked tail is in fact a major trait of the Dicruridae.

NECTARINIIDAE Sunbirds

Eastern Violet-backed Sunbird *Anthreptes orientalis*
Months. June, October, December; casual visitor.

Notes. Observed but three times, presumably an up-slope non-breeding wanderer from Lake Baringo, where common (Stevenson 1980; also at Lake Bogoria, Hartley 1986). Usually occurs below 1300 m (Lewis & Pomeroy 1989), but seen as high as c. 1910 m N

of LU, where a M fed at ground-level herbaceous flowers beneath leleshwa bushes 4 June 1991. Another adult M 5 October 1986 foraged among white flowers at MB, and flashed its yellow side-marks, uttering a buzzy "zwee-zwee-zwee" song or call (see Zimmerman *et al.* 1996, Fry *et al.* 2000, and Cheke & Mann 2001). Finally, at TA 28 December 1993, we saw a subadult M (mixed brown and violet above) along the edge of open woodland, where it perched, watching us for 5 min. Brown & Britton (1980) gave May–June and November–December as the breeding months in our region, though Stevenson (1980) noted that Baringo birds breed throughout the year, except for very dry periods. Cheke & Mann (2001) put E African breeding in all months but March and September. The greenish blue rump seen in these MM is diagnostic for it, which Lewis & Pomeroy (1989) showed as occurring in quarter degree squares to the N, E and SE of the study area. No other violet-backed sunbird could occur.

Collared Sunbird *Antheptes collaris*

Months. January, April–May, July–August, December; sparse resident.

Notes. Inexplicably scarce, indeed less widespread in the Laikipia region than is lower-altitude Eastern Violet-backed (maps in Lewis & Pomeroy 1989). It was most often observed about NG, suggesting that the area is too dry or rainfall too irregular for it. Other than once near Main Gate, and once at GMF, seen otherwise only about river at MK, and at MB. Songs heard only in May and July; it breeds mainly during March–July and October–November (Brown & Britton 1980, Fry *et al.* 2000). A pair fed near Variable Sunbird about flowers of an *Olea europaea* (for nectar, insects, or both) at NG 18 July. M–M chases were noted in January, again at NG. It may be resident only at NG, dispersing out from there. Although commonly in mixed-species foraging flocks (van Someren 1956, Fry *et al.* 2000), we failed to observe it in such flocks, another suggestion that it is not generally resident. Fry *et al.* (2000) and Cheke & Mann (2001) have adopted, too hastily we feel the generic splitting of sunbirds advocated by Stuart Irwin (1999), whose proposals require further studies and discussion.

Green-headed Sunbird *Nectarinia verticalis*

Months. July, one record; rare vagrant from uplands to the S.

Notes. A M was netted low in streamside growth at NG 5 July 1991. It was worn, in molt, weighed 14 g, and had wings a short 58 mm (see Fry *et al.* 2000).

Representing *N. v. viridisplendens*, its body was in heavy molt, and primaries 1 and 2 were new. It utters loud, sharp "t'chew-ee, t'chew-ee" calls somewhat resembling calls of Bronze Sunbird. In aggression characteristically raises head and bill nearly to vertical, with neck feathers partly erected, calling "peeeee-tew." This was probably a post-breeding wanderer from highlands to S (see map in Lewis & Pomeroy 1989), it occurs as low as 1500 m, but usually above 1700 m. Breeding records of Brown & Britton (1980) are not from our region; but farther E at Nanyuki (where not occurring on Lewis and Pomeroy's map) breeds in big rains and indeed following extraordinary rains at any time (especially April–July, also November–February; for E Africa Cheke & Mann 2001 gave March–November), as following heavy January 2001 rains there, in February. Short & Horne (2003) described its nest. The head of the M often appears more blue than green.

Amethyst Sunbird *Nectarinia amethystina*

Months. All; widespread, uncommon, may leave in drought years.

Ecology. Most regular S from Center, and also gardens at Center and Kutu; farther N, most frequent along the Mukutan River and at MB. Only seen once during and after a major drought (in 1984 and 1985), and thereafter in August–September 1986 and 1987. It likely recovered 1988 and 1989; most records are from 1990–1999. Favors tall acacias, especially *A. abyssinica*, in which it frequents flowering Loranthaceae. Also feeds at flowers of *Albizia* (sp., *grandibracteata*, *gummifera*, or their hybrids), *Aloe* spp., Cape Chestnut *Calodendrum capense*, *Lantana trifolia*, *Ruttya fruticosa*, *Spathodea campanulata* (most of these not listed by Cheke & Mann 2001), white composite flowers, and others. It forages for insects, probing into mosses and debris in trees such as *Croton* spp., and by flycatching. Not noted in mixed-species foraging flocks. Although an upland species, rarely reaching Lake Baringo (Stevenson 1980), it is uncommon generally on the Laikipia Plateau (Lewis & Pomeroy 1989), with one record from Mutara (Olson *et al.*, undated MS), but seen at Pinguone (Schulz & Powys 1998), and common at Nanyuki.

Movements. Regular seasonal movements occur in southern African populations of this sunbird (Harrison *et al.* 1997), and elsewhere (Fry *et al.* 2000, Cheke & Mann 2001), but we have no data other than its earlier disappearance and reappearance noted above.

Behavior. Rather well known (Maclean 1993, Fry *et al.* 2000, Cheke & Mann 2001), including displays

(mainly of southern populations). Generally subordinate to Scarlet-chested Sunbird at flowers where feeding. It sometimes is attacked by MM of Variable Sunbird, but is, however dominant over the latter at nectar-feeding sites provided by humans. One fledgling was viciously attacked by a M Variable, its F parent ignoring the interaction. At our Nanyuki house feeders it is regularly supplanted by larger sunbirds (e.g., Green-headed, Tacazze, Bronze), and indeed is often prevented from feeding there for hours at a time.

Voice. Has rapid and slow songs (Fry *et al.* 2000, Cheke & Mann 2001), heard in all months except February–March. Fast songs include: a “tee-tee, tee-pee, tee-tup, tup-tee,” a “cheep-chip-chip-chee-chit-chee,” and a hard, fast “chip” trill, any of which may be carried on or repeated interminably. Examples of slow songs or calls are: “sheep- -sheep, dee- -sheep,” “chip- -cheet- -cheep,” “chit- -chip, see- -tip, bit- -chit,” and “chit- -cha- -chi- -cheet- -cha- -cha- -chee.” Most of these are delivered quite softly, without the zest of songs of many sunbirds. Also utters double or triple “tchew” or “tchee” notes, or these in long, song-like series. Zimmerman *et al.* (1996), Fry *et al.* (2000) and Cheke & Mann (2001) provided information on other calls, as well as more details on songs.

Breeding. That subadults breed is indicated by their singing sustained songs in April–May, and consorting with a F in those months. Courtship was observed (Fry *et al.* 2000) in April, two occupied nests were found in September, fledglings were fed in July and September, and apparently independent immatures were seen August–September. These suggest breeding April–September, in the big rains and onward through July–August rains. There was no indication of breeding late in the year, these results contrast with those of Brown & Britton (1980), who had little July–September and many October–December breeding data from our general region, but with many Arusha, Tanzania, records; certainly they had few if any data from our triple-rainfall subregion. For E Africa Cheke & Mann (2001) gave all months but February. One September nest contained two eggs, the other, two nestlings. A nest at NG was suspended 2 m up a *Euclea divinorum* tree; it had many green lichens and cobwebs in the outer layer, and showed white down from leshwa fruits about the edges and toward the inside. Another nest, examined after abandoned, was at 3.5 m in an *Acacia xanthophloea* tree; it also had leshwa pappus inside. Cheke & Mann (2001) and Tarboton (2001) described the nest and eggs.

Specimen data. Although usually active above the level of our nets, and at edges of woodland, we netted nine Amethyst Sunbirds, six adult MM, two adult FF and an immature M. One adult M was re-trapped 11 and 12 months after it was banded, and hence was over two years old when last netted. The birds were in August, September, November, and January. The six MM weighed 9.75–11.5 g and had wings 62–68.5 mm; two FF were 10.25 and 10.75 g, with wings 61 and 63 mm. The immature M, streaked below and with color coming in its throat weighed 9.5 g. These represented *N. a. kirkii* (Fry *et al.* 2000, Cheke & Mann 2001), but we observed that FF showed a broader and longer creamy white superciliary line than ascribed to this race. Likewise, some FF showed no markings on the (whitish) chin and forethroat. These FF thus tended toward coastal *N. a. kalckreuthi*, although none was so white about the face as illustrated in Zimmerman *et al.* (1996, Plate 107). However, Cheke & Mann (2001) merged *kalckreuthi* into *kirkii*. Soft-part colors: Generally as noted in citations above. The soles of the feet are dull cream-colored. An adult F had the mouth orange in the center and lemon yellow toward the edges and at the gape corners (Cheke & Mann 2001: 233 had F with mouth yellow-gray). Bob-tailed fledglings exhibit the yellow gape wattle. The only November bird was completing annual molt, and one September adult was beginning wing molt; all other individuals were not molting.

Scarlet-chested Sunbird *Nectarinia senegalensis*

Months. Sometimes common resident, few in drought periods.

Ecology. The second commonest and widespread of the sunbirds (after the Variable), there are fewer October–March than during the rest of the year; during October–February those observed often fly over at up to 100 m, in long flights presumably to flower sources. It may be truly resident only about Center, Kuti and Nglesha Center. Aggressive and noisy when common. Utilizes mistletoe flowers Loranthaceae, especially on *Acacia abyssinica*, *Carissa edulis*, *Calodendrum capense*, *Olea europaea*, *Apodytes dimidiata*, *Jacaranda mimosifolia*, *Aloe* spp., and flowers of cholla cacti (*Opuntia* spp., of the “cylindropuntias”) widely used as hedges. See Cheke & Mann (2001: 234–35) for other food plants. Numbers may occur in flowering trees and along cholla hedges, where may attempt to defend flower clumps. Also flycatches at emergences of termites and seen taking spiders. Drinks from water on leaves, at bird baths and from lawn sprinklers. Occasionally joins in mobbing owlets. One exhausted

after netting was fed sugar-water, which it drank for 3 min; it then perched 10 min before flying off. Widespread in uplands, and at most locations on the Laikipia Plateau, E to Nanyuki (see Lewis & Pomeroy 1989).

Movements. Numbers are lower in drought periods and generally in October–November and usually on to February or March. Not seen moving in numbers, though individuals noted flying high and straight for over 1 km.

Behavior. Well known in much of Africa (Maclean 1993, Fry *et al.* 2000, Cheke & Mann 2001). It is one of the most aggressive of sunbirds; at feeders it spends an inordinate amount of time interacting and calling in long-sustained bursts, even after it has driven away an antagonist. It is subordinate to Tacazze, Bronze, and Green-headed sunbirds at nectar-feeders, and dominant over Amethyst and Variable. Seen to fight for 5 min or more, and to fall to the ground clasped with an opponent in battle. At food sources it even drives off large wasps and butterflies. In aggression wing-waves and spreads wings; the whitish mark formed by alular and outer wing coverts at the bend of the wing of immatures and FF is conspicuous when aggressing. Fledglings aggressively beg at nectar-feeders, and may effectively keep all sunbirds away from two or three feeders by aggressively begging, chase-following, and wing-waving at them. See Fry *et al.* (2000), and Cheke & Mann (2001) for other behavioral information.

Voice. Described in such publications as Maclean (1993), Fry *et al.* (2000) and Cheke & Mann (2001), but varies greatly, hence we provide some details. One M in February for several min sang a warbled series including mimicry of the calls of Common Bulbul and Brown Babbler, so at times mimics other birds! The usual song consists of short or longer paused phrases, a “ta-tee-pee-cha-tee-tee,” or “chit-ee -chit-a-ti, ti- -chi,ti,” or “tchup- -cheep- -tchup- -chap-,” or “paa-cheet- -ta-cheet-cheet-.” It can also be fast, a “pa-chee-cheet, pa-cheet-cheet, cheet-cheet-cheet-cheet-,” or a fast “ta-cheet-cheet-cheet, cha-cha-cheet, cha-cheet-cheet-cheet-cheet, pa-cheet, pa-cha, cha-cha-cha-” and onward for 2–3 min. Its call is a whistly “chip,” “cheep,” “chewp” or “tcheet.” In aggression, waving the wings, may call “chek,” or “tcheet-tcheet,” or “tzhaa-zaa.” Also interactive is a typical “tcha-witch, a-wich, a-wich-” resembling calls of, e.g., Bronze Sunbird and Variable Sunbird. A pair together gave a “twitee, twitee, twitee.” During a bout involving attempted copulation, the F called “chip-chip”, the M

attempted to mount her, failed, then flew over her, “singing” in the air: “twec-dee-dlee-dee, dee-deedlee-dee,” with six such phrases. Singing can occur at any time of the year, but only 16 songs were heard in 350 days October–March, whereas more frequent songs were heard on 272 of c. 550 days April–September (data mainly from GMF, where only three songs heard October–March during 1987–1998). At GMF 70% of songs were heard May–July, 27% in April and August–September, and 3% October–March.

Breeding. Brown & Britton (1980) had 54 nesting records, representing all months, with peak months (accounting for 70% of the records) in February–June and October. However, these Region D records are nearly all from biseasonal rainfall areas, and do not adequately represent our subregion. We observed 12 nests that were under construction or occupied, all in May–August. Fledglings were encountered June–September, and independent juveniles in August–September, and once in December. Along with data from singing (above), the breeding season is indicated to be in April–August, thus from the big rains through the period of continental, July–August rains. The dearth of information on breeding, and on singing, for October–January demonstrates lack of breeding during and after the October–November little rains. Subadults were about, and subadult MM sang during April–September, but none was observed in breeding activities. The breeding season for Kenya was reported as January–February and August by Cheke & Mann (2001). Nests have been well-described by van Someren (1956), Maclean (1993), Fry *et al.* (2000) and Cheke & Mann (2001). Seven checked were 0.5–6 m above ground or water; that at 0.5 m was in an *Acacia gerardii* over the pond at acacia crossing. Others were in *Euclea* sp., *Rhus* sp., *Acacia xanthophloea*, and *Tarchoanthus camphoratus* trees. One nest measured 14 cm in height, 7.5 cm across, and had an opening 3.3 cm in diameter. Leaves, tiny twiglets, fibers and cream-white leleshwa seed pappus (down or “fluff”), bound with spider-webs, with fine tendrils and leleshwa “fluff” inside, comprised the nests. One, nearly round, was tucked inside a dense clump of mistletoe. At least one nest was destroyed by a snake. A bob-tailed fledgling showed a reddish mouth lining and red gape corners (see Fry *et al.* 2000). This active sunbird begged from an adult Brimstone Serin, poked its bill into flowers of *Datura stramonium*, and called a harsh “tcheep.”

Specimen data. We netted 11 adult MM, seven adult FF and two immature MM, all in the seven months

of February, April–July, September, and December. Only the two immatures (from September) showed signs of molt. A feature of adult MM not shown in most illustrations (best depicted in Mackworth-Præd & Grant 1960, Liversidge 1991, and Cheke & Mann 2001) is a difference in iridescent green color of the malar stripe, which is set off by a thin, black line of feathers from the chin, and the different green color of the latter. The chin is a lighter, yellow or bronzy green, and the malar mark is deeper green, even with a touch of blue or aquamarine, flashing from the side like a neon mark, much as in Hunter's Sunbird. The 11 MM weighed 12.25–18 g (mean 14.7 g), and wings of eight were 74–78 mm (75.9 mm). The seven FF were 11–13.6 g (12.6 g) in weight and their wings ($n = 5$) were 66–69 mm (67.6 mm). The immature MM were 13.5 and 15.5 g. These represent *N. s. lamperti* (MM slightly heavier, longer-winged than in Cheke & Mann 2001), although MM in field and in hand show blue bars at the tips of some throat-breast feathers; these are supposed to be sparse in this race. A few MM showed traces of violet on the lesser wing coverts, but in no case was this conspicuous (see Fry *et al.* 2000 and Cheke & Mann 2001). Soft-part colors were as reported in the literature. Its long, tubular tongue has a bifurcate tip.

Hunter's Sunbird *Nectarinia hunteri*

Months. December–January, probably October; casual upslope vagrant or visitor from Lake Baringo.

Notes. A definite movement of this sunbird occurred about the Mukutan and its drainage October 1987 to January 1988. One heard by D. Chepus, familiar with it from NW Kenya, flying along the slope of ML 20 October 1987. At Center Dam 31 December 1987 a M perched and, later that day, two or three MM flew NE at MK. One was at MK 2 January 1988, and on 3 January 1988 some nine were observed, calling, as they flew S down lugga, in twos and one group of three, including a F. Two of the latter nine (eight were MM) perched briefly in the top of a croton; we could see their black chin, and the glint of their violet “wrist” patches and green malar stripe in the sun. Their “pew” call differed from the usual “chip” or “chek” call of the Scarlet-chested Sunbird. The only other record was of a subadult M at LA, near MK, 7 January 1994. This Hunter's Sunbird flitted about an *Acacia xanthophloea*, then fed at flowers of *Ruttya fruticosa*, allowing close observation of its red-blotched and spotted breast and throat, its black chin, and tiny flashes of green in its malar areas. It was otherwise yellowish white below with brown barring,

and gray-brown above. It did not call. Young Scarlet-chested at this stage show a greenish, not a black chin. This sunbird occurs in dry areas below 1200 m; it is common at Lake Baringo, where it breeds January–September (Stevenson 1980) and at Lake Bogoria (Hartley 1986). Movement up the Mukutan to the study area, along its drainage into Lake Baringo, is not unexpected. We note that 1987 was a dry year with, however, unusually good little rains in the study area October–December, so the birds may have been attracted to upslope flowers. Curiously, Lewis & Pomeroy (1989) mapped its occurrence across the Laikipia Plateau to the E of the study area (it is reported from Mutara, Olson *et al.*, undated MS) and particularly in quarter-degree square 50D, to the SE of the area, all of which is well above 1550 m, and the great bulk of which is above 1700 m. Our observations of Hunter's Sunbirds were at 1750–1950 m, and 11–15 km up the Mukutan River from its range at 1200 m E of Lake Baringo. In any case we consider these birds post-breeding upslope wanderers foraging where conditions were favorable, a bare 10-min flight for them from their usual habitat.

Tacazze Sunbird *Nectarinia tacazze*

Months. One April record, vagrant from highlands just to the S.

Notes. A fully adult M with long tail was observed closely while foraging at the water-crossing at NG 8 April 1998. We watched it perch, preening, for 4 min, noting its reddish violet breast and rump. This is a common, and the dominant species about our Nanyuki home, at about the same elevation, 1950 m, at which observed at NG. Downslope movement to at least 1650 m is known (Lewis & Pomeroy 1989), but wandering can be expected due to large-scale clearing of the Ol Arabel-Marmanet-Lariak forest “reserves” just S of the study area, toward Nyahururu. There appears to be no non-breeding plumage of MM about Nanyuki (see Cheke & Mann 2001: 250).

Bronze Sunbird *Nectarinia kilimensis*

Months. All except March; resident in small numbers, mainly at NG and near habitation.

Ecology. This common and well-known sunbird (van Someren 1956, Maclean 1993, Fry *et al.* 2000, Cheke & Mann 2001) is often a forest-edge species (Dowsett-Lemaire 1990, Schifter & Cunningham-van Someren 1998), but also favors gardens. It is frequently seen only about Center and the Nglesha forest patch and farm; it also was regularly seen about the Main Gate, particularly among the cholla cactus flowers,

and less frequently about mistletoe flowers (Loranthaceae) at SI and LU. Otherwise seen only at Education Center and PO, thus occurs at lush sites in the S, above 1800 m, and at Center. Defends clusters of cholla cactus flowers and mistletoes, also frequents *Aloe* spp., *Jacaranda* sp., Australian bottlebrush *Callistemon* and others. Feeds on emerging termites as well. Drinks from bird baths and garden sprinklers.

Movements. Some may wander into area from adjacent highlands to the S. Two MM were observed flying NE high over LU 20 July 1991. Known to wander somewhat (Lewis & Pomeroy 1989).

Behavior. Well known, see above references. Seen to sing in upward flight display at other MM while defending mistletoe clusters. One M chased, and was chased by a M Golden-winged Sunbird.

Voice. Well known (Fry *et al.* 2000, Cheke & Mann 2001). Melodic call “chew-ee, chew-ee” or “dzha-wee, dzha-wee,” is diagnostic. Gives slow, repeated “CHEEE-weet” when coming to a nectar-feeder occupied by large sunbirds such as the Tacazze. Also gives an aggressive “shereee, sherEEE, sherEEE, sherEEET” at times. Songs have been heard in April–September, and also in January and November, but we were in their habitat insufficiently often to gain information on frequency of songs.

Breeding. We have little information. Nests were found at 5 m in a Nandi Flame tree *Spathodea* sp. at Center 27 August, containing young that fledged in September, and at 3.5 m in the tip of a *Croton* sp. branch at NG 30 May, likely containing eggs. These sparse data suggest a breeding regime about the April–May big rains and into the July–August rains. Brown & Britton (1980) found the main peak in our region to be in March–May, in the big rains, but probably nests regularly into the July–August period in our sub-region. Cheke & Mann (2001) had breeding November–August. Nests appeared typical of those described by Fry *et al.* (2000) and Tarboton (2001), except that lichens were placed about the outside of the two we noted (see Cheke & Mann 2001).

Specimen data. One M typical of the nominate race, weighing 17 g, was netted at Center in February. A suggestion of molt was an adult-plumaged, calling M lacking long rectrices 20 May, which would seem a poor time (breeding period) to be without them.

Golden-winged Sunbird *Nectarinia reichenowi*

Months. May, September; occasional visitor from higher elevations to the S.

Notes. A fully breeding-plumaged adult M was in an aggressive encounter with a M Bronze Sunbird at

mistletoe clumps in an *Acacia abyssinica* at NG 28 May 1997. There was also a M at Center garden 21 September 1989, and one was observed in May 1980 below Big Dam, in a garden situation, reported by S. Sassoon and C. Francombe. Mr. Francombe, long-time resident at Center, noted that he occasionally saw this sunbird in some years but not others. It is well known for extensive downslope March–September migration (Fry *et al.* 2000, Cheke & Mann 2001) to as low as 1200 m, and occurs across the Laikipia Plateau from the study area to the E (Lewis & Pomeroy 1989, Olson *et al.*, undated MS, Schulz & Powys 1998), and at Nanyuki.

Malachite Sunbird *Nectarinia famosa*

Months. June, casual downslope visitor from S.

Notes. Our single record is of a M that flew up from the lugga, perched briefly on an olive, then flew far to the E over us, at MB 3 June 1990. Its green color overall, long tail and yellow tufts at its sides made it readily identifiable. Known from just S of the study area (Lewis & Pomeroy 1989), and a marked downslope wanderer and migrant, especially March–June, from higher elevations, it was a pleasant surprise to see this elegant sunbird.

Beautiful Sunbird *Nectarinia pulchella*

Months. January, two records; casual visitor from Lake Baringo area.

Notes. Another occasional upslope visitor from the Lake Baringo area, where very common (Stevenson 1980), occurring to 1900 m, but more usually below 1500 m (Lewis & Pomeroy 1989, Stevenson & Fanshawe 2001). We noted a M at LU feeding on flowers of *Syzygium cordatum* (not listed among its foods by Cheke & Mann 2001) 6 January 1988, and two MM at *Aloe* spp. and other flowers in the garden at Kuti 7 January 1997. The former followed a year deficient in rainfall but with reasonable October–November rains, and the latter followed a year with above average rains, but with weak October–November rainfall. The two sites are at 1880–1920 m, and some 15–17 km from its usual altitudinal level about Lake Baringo, including Tanguil Bei, where we have seen it. All three MM were in breeding plumage. Beautiful Sunbirds breed at Lake Baringo January–September, for which activity they were in appropriate plumage.

Marico Sunbird *Nectarinia mariquensis*

Months. All but October–November; locally uncommon resident in low numbers.

Ecology. Seen most frequently in mistletoe clumps (Loranthaceae) at SI, also resident at TA, and regu-

larly in the gardens of Center and Kuti, with infrequent occurrences at MB, FS, PK, LU, and NG. Observed once at GMF, and an LAT record is the only one from the lower Mukutan sites. Feeds at flowers of diverse plants, including garden exotics; at flowers of *Acacia gerrardii*, mistletoe flowers on *A. abyssinica*, *Calodendrum capense*, *Jacaranda mimosifolia*, *Spathodea campanulata*, and occasionally of *Aloe* spp., as well as extensively upon various other mistletoe flowers (see Cheke & Mann 2001: 284 for other food plants). Also picks insects from bark, and feeds (on insects) at new buds of leafless *Acacia xanthophloea*. Drinks at sprinklers and bird baths.

Movements. None noted, could undergo movement, as elsewhere (Fry *et al.* 2000, Cheke & Mann 2001).

Behavior. Dominated at flower sources of nectar by larger sunbirds, particularly Scarlet-chested. In M-M encounters, one M seen to spread bright throat feathers and droop wings as it called at other M.

Voice. Call a "t'chip," in flight often "tchit-tchit." Songs were described by Zimmerman *et al.* (1996), Fry *et al.* (2000), and Cheke & Mann (2001). Those heard in the study area most often were in the form of a chipping trill, somewhat resembling that of the Purple Grenadier, a "chi-chi-chi---chip," or a more warbled "chee-chee-chee- -chee-chip," sometimes with faster "ti-ti-ti" segments. We have also heard a slower, extended "tit-tit, tit-tit, tit-it" form of song. Songs were heard May–September and in December and February. *Breeding.* Brown & Britton (1980) gave records for March and May for our general region. We had a June nest at TA with incubation under way, a July nest at Kuti under construction by the F, and a September nest at TA with two tiny, naked young. With the information from singing, a May–September breeding season is indicated, i.e. from the big rains through the July–August rains. Nests were at 2.1, 2.75, and 4.9 m respectively in trees of *Dodonaea angustifolia*, *Euclea divinorum*, and *Acacia hockii*. The nest was described by Fry *et al.* (2000), Cheke & Mann (2001), and Tarboton (2001), and is of tightly bound fibers wound with cobwebs; two of ours had white feathers clearly visible (probably from domestic chickens available close by at TA and Kuti), and two had lelehsa-seed down, both within the nest and stuck into the outside.

Specimen data. We netted three MM, two at Center in February and one at PK in September. These weighed 10.5–11.5 g, and represented the bright green *N. m. osiris*, with its narrow maroon breast band (Fry *et al.* 2000). We noted the blackish loreal area, seen in the field and in hand, usually showing no iridescence

and especially shown well by Cheke & Mann (2001, Plate 39). The two February MM were in wing molt (new primaries 1–3), and the September M was in full molt (4 rectrices, 5 primaries to go, new secondaries, only the long tertial new, body mainly new, head and neck fresh; the throat-breast blues and violets seemed mainly fresh, the more maroon-red feathers mostly worn). Soft-part colors were as described (Fry *et al.* 2000). NOTE: we do not report it for the area, but Horne observed a M Purple-banded Sunbird *Nectarinia bifasciata* just outside the E boundary of Olari Nyiro 20 May 1969. Familiar with this sunbird in W Kenya, she noted the more violet breast, bluer green upperparts (except bluer, less green about the uppertail area) and smaller bill distinguishing it from the Marico Sunbird. Recently separated (once again) from *N. tsavoensis* in the dry SE of Kenya (Fry *et al.* 2000, Cheke & Mann 2001), but it is W *N. bifasciata microrhyncha* that she was used to separating from *N. mariquensis*, and it is that form of *N. bifasciata* that wanders out-of-range (Lewis & Pomeroy 1989, Fry *et al.* 2000).

Shining Sunbird *Nectarinia habessinica*

Month. Single January record; upslope wanderer from the NW.

Notes. A M and at least two FF of this distinctive sunbird foraged in *Acacia xanthophloea* and *Albizia* sp., with five *N. amethystina* in the lower Mukutan River Gorge (Fig. 13) at c. 1650 m 6 January 1995. Nearly the size of the Amethyst, the gray, startlingly pale, almost unstreaked FF of the Shining Sunbird were in their way as distinctive as the M. As they moved about, the black of the M's belly, its triple breast bands and the white superciliary line of the FF were conspicuous. Flowering was very marked at this time, following wet 1994 and strong little rains. Usually found at 1000 m and lower (to 1800 m in Ethiopia, Cheke & Mann 2001), such areas are 18–25 km downstream and W of where we saw this sunbird, which only occasionally reaches the Baringo area (Stevenson 1980), and occurs in an arc around the NW to NE edge of the Laikipia Plateau (Lewis & Pomeroy 1989). It is subject to movements in parts of its range (Fry *et al.* 2000) and would be attracted to such unusual flowering events as we describe.

Variable Sunbird *Nectarinia venusta*

Months. Common to uncommon resident, depending upon rainfall.

Ecology. By far the commonest sunbird, and the most widespread in the study area, thanks to the diversity

of its feeding modes and of feeding sources. Nonetheless, virtually disappears in very dry periods that are extended; and numbers are low and sites occupied few in dry years (except about gardens at habitations). Reaches flowers inaccessible to other sunbirds through its adeptness at hovering (also utilized to shower in lawn sprinklers). Eats nectar from a host of flowers large and small, including mistletoes of the Loranthaceae and *Viscum tuberculatum*, *Calodendrum capense*, bottlebrush trees *Callistemon* sp., *Acacia abyssinica*, *A. gerrardii*, *A. xanthophloea*, *Aloe* spp., *Leonotis* spp., *Ipomoea* spp., *Jasminum floribundum*, *Justicia* spp., *Vigna membranacea*, *Olea europaea*, *Carissa edulis*, *Gloriosa superba*, *Ruttya fruticosa*, *Jacaranda mimosifolia*, *Salvia nilotica*, *Grewia similis*, *Spathodea campanulata*, and others, plus a host of cultivated flowers in gardens (see also Fry *et al.* 2000 and Cheke & Mann 2001). Also eats spiders and many insects, including flying termites during emergences. Occurs at all sites, in open woodland, edges of dense woodland, wooded grassland, degraded bushed grassland, and vegetation around water, at all elevations; seen atop Ol Doinyo Oirua Peak at 2140 m. With good rains as many as six pairs occurred within 150 m of GMF, where we had but one pair of Scarlet-chested Sunbirds, if any. Seen digging into lichens of a near-dead *Olea europaea*, presumably for insects. Drinks from puddles, bird baths and lawn sprinklers; bathes occasionally. Sometimes participates in mixed-species foraging flocks, especially with warblers and white-eyes and tits, but less frequently with mainly flycatcher flocks of drongos, batises, paradise monarchs, Pallid Flycatchers, cuckooshrikes, orioles, and other large passerines. May actively join birds mobbing snakes, and a pair mobbed a perched African Goshawk. It is found throughout the Plateau downslope to at least 1200 m (Tangul Bei), occasionally reaching Lake Baringo following rains (Stevenson 1980, Lewis & Pomeroy 1989).

Movements. Known to undergo movements, at least locally (Stevenson 1980, Dowsett-Lemaire 1990) numbers in the study area fluctuate widely. We saw six moving N into the study area at the Main Gate 3 January 1994, and movements of two to four high over us to the N and W were observed in November–January of several years. Often absent at GMF, then appearing in April or (1996, 1998) May, and disappearing in September–October. Thus variation in numbers and its presence-absence reflect movements, as well as mortality due to dry conditions. Moves N with rains in W Africa (Borrow & Demey 2001).

Behavior. Perhaps less aggressive than other sunbirds (most sunbirds sympatric with it are larger), strong interactions occur when (April–November) two of one sex are present with one of the other. FF chase as vigorously as MM chase one another (these are additional to the chases at food sources). Aggression to other species is shown by a M that viciously attacked two fledgling Amethyst Sunbirds, knocking one from its perch, and pursuing both for 1 min. Two MM sang from the same (small) tree for 2 min at GMF; a nearby F gave a chattering call, and one M then attacked the second, and all three flew off in a chase. One pair together, the M singing to the F, both swung their heads side-to-side; the F puffed her throat, erecting feathers, then led the M away. Aggressing MM maintain head and throat feathers smoothed, thus appearing reflective; they tend to lean forward, bill toward an antagonist, but “drape” the breast and belly feathers outward, such that they look big-bellied. For other displays see van Someren (1956) and Fry *et al.* (2000).

Voice. Call note a loud single, double or repeated “chit” or “tcheet.” As frequent is “ch’wee, ch’wee” or “che-wee, che-wee.” Also has more song-like trill, a “tseet-t-tttttt.” Begging fledglings call surprisingly loudly “pseep” or “t-seet.” Other series calls of adults are: “chew, chur, chwi, chwi,” “chwit-chee, wit-cha, wit,” and “tchwi-chi, witchi, wit-chi, wit.” Songs can be a short, simple “tsi, tsi, tsee-sit, tsee-sit;” more usually it consists of a variable start, “per-lee, pachi-chi,” or “chi-chee, cha-chee, a-chi,” rapidly leading into a fast “chi-iiiiiiiiiii” trill. The song is rapid and uttered with zest. We have heard it mimic the slower song of Scarlet-chested Sunbird. MM sing from nectar-feeders to which pairs bring their fledged young. For other details of song see Fry *et al.* (2000) and Cheke & Mann (2001). Sings in early and late bursts when breeding, and also thereafter; sang prior to 06:00 h from April–November, with 1992 singing at 05:45 h (in dark) during October; December songs were rarely heard before 06:01 h. It casually sang to 19:00 h (May–July), with late songs more usually at 18:40–50 h. Song peaked in July, both in the study area overall and at GMF. Almost no songs were heard January–March; 93% of songs at GMF, and 98% of songs generally were in April–October, with more than 75% in May–August. There was a very small peak of song October–December.

Breeding. Of 17 nestings or indications thereof (carrying of nesting material and insect food, if not actual nests), 12 were in July–August, three in May–June

and one each in September and October. Other than small peak of singing October–December, the only indication of breeding during or after the little rains was a bob-tailed fledgling at Center in February 1985; this followed the drought year of 1984, in which the significant rains were late in the year. Displays commonly involved pairs April–August; newly fledged young were seen June–October, and immatures noted August–January. Breeding is thus May–September or October, and rarely later, although exceptional rains could trigger breeding at any time, as in October 1992. Brown & Britton's (1980) records from our general region are predominantly April–June and December (during and following the big rains and following the little rains), with some records in all months except July; their records clearly indicate that most or all are from a bimodal rain regime, the July–August preponderance of our records illustrating the significance to our subregion of July–August rains rather closely following the big rains of April–May. Nests and nesting have been described by van Someren (1956), Fry *et al.* (2000) and Cheke & Mann (2001). Eight nests we could examine were at 1–4.5 m (mean 2 m) and were in *Carissa edulis* (three), *Euclea divinorum* (two), *Tarchonanthus camphoratus* (two), and *Rhus* sp. (one). One Nanyuki nest was at 1.5 m in a *Lantana vibernoides*. One F hovered to pull free strips of grass for one nest. All nests of which we could glimpse the insides contained the fluffy seed covering of leleshwa. One or two young fledged from five nests; predators, including snakes and once Gray-headed Bush-shrike, destroyed three nests; at least once the sunbirds successfully re-nested. Two fledglings that left a nest on 22 September came back to the nest to roost with at least one parent for five successive nights. We were unable to establish that any pair raised two broods, although a pair at Nanyuki nested in April, July, and October of 2001 (one or two young fledged from each nest).

Specimen data. We failed to net or observe MM in eclipse plumage (see Fry *et al.* 2000). We did net 10 adult MM and two adult FF, as well as a fledgling, apparently F. These weighed 6.5–8.5 g (7.43 g) for MM, 6.25 g and 6.75 g for FF, and the fledgling was 6.5 g. Wings of the MM were 51.5–57 mm (53.4 mm) for five (we could not treat every bird in detail because sunbirds are delicate and require immediate treatment); the FF had wings 46 and 48.5 mm. They represent the yellow-bellied race *N. v. falkensteini* (see Fry *et al.* 2000 and Cheke & Mann 2001), although ventral colors of MM vary considerably (extremes

resembled three “races;” one was white below, several showed orange and one had red feathers mixed with yellow-orange on its breast). Most MM seen, and all those handled, showed some orangish or even red-orange in their pectoral tufts. One adult M banded at MK 7 August 1990 was retrapped 20 June 1991 and again 23 July 1993, at which time it likely was over four years old. This M weighed 6.5 g all three times that it was handled, and was not in molt on all three dates; its wings measured 55 mm in 1991 and 51.5 mm in 1993. The specimens represented February, April, May, June, July (the M netted three times), August, October and November (there were six for February and two each in June and August); the November M was in mid-molt, the April M completing its wing, tail and body molt, and all others were not molting. One June F had a brood patch. Soft-part colors: two blind, naked young one to two days old were pink-skinned with a yellowish bill and yellow gape wattles; the fledgling from February also had yellow gape wattles. Other soft-part colors are as noted in Fry *et al.* (2000). We did notice in one M (that of May 1994) two apparent gular patches, very small, on either side of the chin, separated by a fine line of black feathers. This sunbird has the usual bifid-tipped, tubular, brushy tongue.

ZOSTEROPIDAE White-eyes

African Yellow White-eye *Zosterops senegalensis*

Months. The commonest white-eye, numbers fluctuate.

Ecology. Widespread at edges of forest and thick riverine woodland, in open woodland, bushland, *Combretum* grassland and gardens; keeps to well-leaved trees during dry periods. At times associates with the other two white-eyes. Forages for insects, nectar and fruit, usually in small groups, but in flocks especially November–February, but also in July–August, these numbering up to 50. Feeds at flowers of *Croton macrostachyus*, *Calodendrum capense*, *Syzygium cordatum*, *Apodytes dimidiata*, and with sunbirds in *Albizia gummifera*/*grandibracteata*, as well as flowering *Acacia abyssinica* and others. Eats fruits of *Strychnos henning-sii*, *Euclea divinorum*, and *E. racemosa*. Readily flycatches during termite emergences, and forages for insects in dead-leaf clusters of *Croton* spp. Often in mixed-species foraging flocks, especially with warblers, tits, Variable Sunbirds, estrildine finches, and buntings; sometimes with batises, paradise monarchs, orioles, drongos, and bush-shrikes. It actively joins groups of

birds mobbing snakes, and especially Pearl-spotted Owllet and Gray-headed Bush-shrike; attracted to calling mist-netted birds. Regularly comes to water, bathes amid other birds such as bulbuls; once 12 bathed together. Found at all sites and elevations, although outnumbered by Montane White-eye at NG. The study area is supposedly at the E edge of its range (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996), but Britton (1980) and Fry *et al.* (2000) listed “Laikipia” in its range; it is reported for Pinguone (Schulz & Powys 1998), and we have seen it about Nanyuki.

Movements. When flocking moves considerable distances, beyond dispersal movements. Entirely disappears October–December or January of some years (e.g., 1984, 1991), and present in very low numbers in others (e.g., 1985, 1990, 1997). Only in May–September is it about in numbers, in all but drought years.

Behavior. Well known in southern Africa (Maclean 1993, Steyn 1996), but little information from East Africa (information in Fry *et al.* 2000 largely comes from forms elsewhere). Bows up and down at times when singing. We observed displays involving bill-pointing, and cocking of the tail in apparently paired birds, neither noted in Fry *et al.* (2000). At Sipili in July 1987 the song of one Yellow White-eye brought a Brown-backed Honeyguide to it (not known to be a nest parasite of this white-eye, but in absence of congeners could be such in the study area).

Voice. White-eyes have very similar calls and songs, and we are wary of accepting sound recordings such as are listed by Fry *et al.* (2000) as being correctly assigned to species. Horne has studied sympatric white-eyes (1987), and unless one knows the species well (especially by collecting and playback experimentation), confusion is possible. Horne (1987) designated five white-eye vocalizations: 1) flight calls; 2) feeding and contact calls; 3) agonistic or aggressive calls; 4) songs, and 5) roosting calls. Among Mascarene white-eyes, she found the most marked differences between races of a single species. Twittery, tweety songs with trills vary considerably, and may occur as muted sub-songs; they are generally derived from flight calls and contact (flocking) calls, with a propensity for mimicry from other birds (Horne 1987). Mimicry of Violet-backed Starling, Blue-eared Glossy Starling and Common Bulbul was heard. A typical, non-mimicked song, with its slightly nasal twang and uniform tempo of white-eyes is a: “zhee-a-wee-tsee-wee-pip-zee-tzhee-zhaa-tee-ta-zhee-tzha-zee.” Dawn songs mark the breeding season. All singers in an area join in;

when three to six MM or more sing it is difficult to distinguish individuals, nor can one be certain that all represent the same species. Occasional songs were heard early (near dawn) in February of 1998, but mainly in April–October. Indeed 94% of 290 songs and 98% of repetitive, long-sustained singing were April–October, with 67% of both occurring June–September. Both songs and sustained songs peaked in July and September, with less in August, a climb toward the July peak from April–June, and a drop-off from the September peak through October, with virtually no songs in November and few in some years during December–February. Although songs sometimes commenced in April, that month only saw calls in some years, song beginning between late April (as in 1997), early May (as in 1996) or even late May (as in 1994). During 1993 virtually no singing occurred, at any time (we heard a few songs in late May and in August). Dawn songs were evident pre-dawn (05:45–06:00 h) in May–June and August–October; such songs at 06:01–06:18 h, true dawn songs, occurred in February, April, and July. Dusk songs were less pronounced and were early, the latest at 19:03 h, in August. In addition this species gave contact “pit” calls and multiple “pit-pit” calls as flight intention calls and flight calls. We also heard squeaky notes uttered as white-eyes foraged. The “*Zosterops* note” (Horne 1987), characteristic of a range of Afrotropical, to Australian white-eyes that we have heard (recorded by Horne), is given by African Yellow White-eyes as a “where-are-you?” (or “u-wee-ee-ee-ee”) contact note, an “anxiety” call, and as an alarm-aggressive (e.g., “preezzzew”) note associated with interactions. Squeak-trills and buzzy trills (“bdddtdt”) were other agonistic calls, as was the occasional alarm snarl. Some of these, particularly “pit” notes and “*Zosterops* notes,” can be heard in some of its songs.

Breeding. Nest-building activity and nests are known from April–September with seven from April–June and six in August–September. Displays of pairs were seen May–September, and cloacal protuberance and brood-patch data are from birds netted in May–September. Fledglings marked June–September, immatures were seen to December, and subadults observed in January–February. Brown & Britton’s (1980) data are inappropriate, as two of their three records for the region represent *Z. vaughani* of Pemba Island (Fry *et al.* 2000). Breeding thus occurs late in the April–May big rains and onward through the intercontinental rains to September. Nesting material is sometimes obtained from tree bark; spider webs, fine fibers of plants

and vines and leshwa seed fluff (partly obtained by one pair from an occupied Variable Sunbird nest), were integral parts of most nests, while one had several larval wasp cases (with lids) built into it. Most nests were out of reach, and indeed obscured by thick leafage. *Acacia xanthophloea*, leshwa, *Euclea* spp., *Croton* spp., and *Croton dichogamus* were some of the trees/bushes used; nests were at 2.5 m or more, except for one at 1.2 m in the small, last mentioned croton (this nest, possibly involving one Montane White-eye, see below, was abandoned). Two and three bluish eggs were in two nests, while others contained eggs or young. In but one case did we observe three fledglings; most pairs were encountered with two, and only one was noted in two cases. Note that breeding closely matched the singing of these birds (see Voice above), i.e., mainly April–September.

Specimen data. We netted 36 white-eyes ascribable to this species, with some qualms. There are problems of nomenclature and identification in treating white-eyes. Sibley & Monroe (1990) considered *jacksoni* as a subspecies of *Z. poliogastrus*, overlooking *jacksoni* being sympatric with *Z. p. kikuyuensis* in central Kenya; and *Z. abyssinicus flavilateralis* has by some been treated as a race of *senegalensis*. *Z. s. jacksoni*, *Z. p. kikuyuensis*, and *Z. a. flavilateralis* are sympatric in the study area. Identification problems involve variation, wear and fading, and ageing. Thus some African Yellow White-eyes are very yellow, with reduced green; there is great variation in extent of green ventrally (see Chapin 1954 and Stevenson & Fanshawe 2001), and on the crown; and the white orbital ring of course varies in size with age, the flange or wattle being tiny in fledglings, small in immatures and variable in size in adults. Zimmerman *et al.* (1996) made no mention of immatures of the white-eyes, and Fry *et al.* (2000) failed to note an eye-ring difference from adults in younger birds. Differences in black loreal markings are exaggerated by those authors – all three of our white-eyes show a black line across the lores (depicted clearly in Stevenson & Fanshawe 2001, Plate 220), although the loreal area is more black in *Z. senegalensis* than in the other two. Zimmerman *et al.* (1996) stated that *Z. abyssinicus* has no black on the lores, and Fry *et al.* (2000) had black at the base of the bill and near the eye, but not across the lores. Mackworth-Praed & Grant (1960) also noted this lack of black on the lores of *Z. abyssinicus flavilateralis*, while having on Plate XV a photo of van Someren's (1956, as *Z. senegalensis flavilateralis*) that clearly shows a fully black loreal line. Thus it is evident that identification of white-

eyes in the field, and assigning of vocalizations to one species or the other, are fraught with problems, to which we gave constant consideration.

Of the 36 birds, two were immatures and three were fledglings; four were collected and are in the NMK collection, all from MK in 1983–1985, and three were re-netted once or twice, or identified by band color (up to 22 months after first netted). Others were netted; up to eight birds of one flock were taken in one net at the same time. We often were pressed for time, and so we had to release some or all *Zosterops* at times. Of those eight netted and released, only one narrow-wattled bird could be treated, this was a young African Yellow White-eye; the other seven included two narrow-wattled white-eyes, four adult African Yellow White-eyes, and one very large-wattled *Z. poliogastrus*. While we cautiously designated the three narrow-wattled white eyes as immatures of the African Yellow White-eye, two were very yellow and, with narrow orbital wattles, would have been noted as "Abyssinian White-eyes" (see below) by most observers, some of whom alternatively might have viewed all as variants of the "majority" of four or five appearing most like the African Yellow White-eye, and called all eight that white-eye. The 31 adults weighed 9.75–14.5 g (10.91 g); five sexable as MM were 10–14.5 g (11.25 g), and two FF were 10.5 and 12.5 g. Of 18 that could be measured, the wing-length range was 54.5–62 mm, and the mean 57.94 mm. These are somewhat less than given by Fry *et al.* (2000) for *Z. s. jacksoni*, but closely match figures by Mackworth-Praed & Grant (1960), and Schifter & Cunningham-van Someren (1998). Britton (1980) noted "Laikipia" as within range of *Z. s. jacksoni*, but Lewis & Pomeroy (1989) mapped this race occurring SE only to its W edge (their square 50, quarter-square B) and no farther E (we have such white-eyes at Nanyuki) although it is on mountain "islands" to the NE. The February and December immatures weighed 11.5 g each; the three fledglings, caught in the same net together, with no adult nearby 20 August 1987 at MK, weighed 5.5, 7.5 and 8.0 g. The fledglings had the barest trace of a white orbital wattle, and that of immatures was narrow, less broad than in narrow-wattled adults. Younger birds were duller yellow, less bright and less clear-cut green and yellow than adults. Adults varied considerably: two were barely greenish dorsally, on yellow; some had considerable green on the sides and across the breast, whereas others had greenish narrowly on the sides and flanks, and a few showed no detectable green ventrally. The yellow fore-

head varied considerably, from narrow and even broken by green from the crown reaching the base of the bill culmen, to moderate, to yellow reaching the forehead, and some had a fully yellow top of the head (brighter to the front and laterally at the superciliary mark). The loreal black varied from a narrow line to a broader patch connecting the base of the (black) bill to the black area in front of, and extending below the eye (birds with erected head feathers showed a broken loreal line, the black only visible at the rear of the lores and near the bill). Molt may affect the colors in the field. Of seven molting adults, initial stages of molt were evident in April and August individuals, mid-molt of flight feathers was manifested in July, August and December white-eyes, and the molt was terminating in June and September birds. One adult in April showed arrested wing molt, with primaries 1–6 fresh and fully grown, and no other molt. The two netted together 25 April had engaged in allopreening before flying into a net; one netted 7 August 1987 was seen 2 July 1988 gathering spider webs; and there were two obtained 4 June, one entered the net first and called “pit” – the second bird approached to within 25 cm of the net and sang toward the netted bird, before entering the net itself.

Soft-part colors: The bill is black, sometimes with blue evident on the gonys and base of tomtia; the mouth lining is horn-colored (none shows a horn-colored bill, see Fry *et al.* 2000). The orbital white wattle was not measured in all birds, but varied considerably; tiny traces were all that were evident in the three fledglings, but three adults had a wattle 1.4–2.1 mm wide and a subadult, 1.5 mm. The color of the eyes varied, being deep brown in some, especially in the immatures (dark brown with red-brown outer ring in two of the latter); others have the eye chestnut inwardly and buffy brown in outer ring, or the iris noted as umber brown or pale brown. The legs and feet are gray or blue-gray, as are the claws; pads of the toes are dull yellowish white. Adult specimens generally match *Z. s. jacksoni* in color and measurements.

Montane White-eye *Zosterops polioastrus*

Months. All; local in S and W, perhaps resident only at NG.

Ecology. Occurred between 1737 m (MK) and above 2000 m (NG), with *c.* one-third of all observations at NG. Occurs slightly N of where shown by Lewis & Pomeroy (1989), who mapped it to the S and E; also at Mutara just to our SE (Olson *et al.*, undated MS) and we have observed it at Nanyuki. Forages at

flowers of *Acacia abyssinica* and others, but mainly noted gleaning and probing in foliage for insects. Flocks on its own, and sometimes in mixed-species foraging flocks that include various warblers, and occasionally African Yellow White-eyes, (e.g., several among the latter at SI 10 December). One flock of eight foraged near a M African Yellow White-eye singing close to its mate, without interaction, at MB 10 June. Flocks of up to 12 noted at ML 3 July, and in larger flocks, to 40 or more, in December–February. Seen bathing at GME, an apparent pair, on 7 May. Several were in a group, including some African Yellow White-eyes, mobbing a Pearl-spotted Owlet at LU in January.

Movements. Not observed between sites, but almost all occurrences away from NG were in April–July and December – many of these were of pairs however. Thought to be sedentary (Lewis & Pomeroy 1989, Fry *et al.* 2000), but undoubtedly moves locally.

Behavior. Fairly well known (van Someren 1956, Fry *et al.* 2000). Two interacting alone (pair?) at MK, calling, swung side-to-side and flitted about in chases. Aggressive to small-wattled but green, presumed immatures in flocks.

Voice. Calls generally as in African Yellow White-eye, with “pit,” buzzy and “*Zosterops* notes” (see Voice under African Yellow White-eye, above) in contact calls and flight calls. These may be contained within the song, which has warbled notes and “*Zosterops* notes,” as well as some buzzy and other high-pitched almost whistley notes; dawn songs are more complex than described by Zimmerman *et al.* (1996) and Fry *et al.* (2000), and longer than those remarked upon by van Someren (1956). One such is “zee-zha-zha-zha-zhee-zee-zha-zha-zhee-zee-zha-zha-zhee-zee-wee,” in a nasal, up-down sing-song fashion. When there is a dawn chorus it is difficult to descry individual songs, let alone songs of two white-eye species (at MK, LA, and NG both Yellow and Montane occur). There also is a ventriloquial quality to the songs that makes it difficult to locate the stationary singer(s). Studies are required of the several species, particularly in sympatry. Songs were heard April–June, and especially September–December.

Breeding. One nest attended by two Montane White-eyes was found at 2.4 m near the top of an unidentified, leafy bush 27 May at NG. The nest was constructed of fine fibers from rootlets and vine tendrils, with cobwebs about it and a sprinkling of “fluff” of lelewha scattered outside, and visible on the inside wall. Possibly lichens were included but we saw no

moss (see van Someren 1956: 432). It was suspended between two very fine branchlets but bound to the plant stem. Two incubated blue eggs were within it. Adults with a well-developed brood patch, and cloacal protuberance, were netted in May, June and July. Nesting later in the year, suggested by singing September–December (Voice, above), is attested to by two immatures with thin orbital wattles in a flock of *c.* 25 Montane White-eyes at NG 18 January; these were fed by one or two adults, and hence had fledged in December or January. Immatures with a narrow white orbital wattle, but otherwise green as adults, were observed in a flock of *c.* 40 at NG 6 February, and several of a July flock at ML also seemed to be immatures. From our general region, but with 35 of 48 breeding records in the Nairobi area, Brown & Britton (1980) found the peak of breeding in March–June (37 records). They discounted little or “short” rains (late in the year) breeding, but had nine records or 19% of the total in September–January, and likely had no records from our triple-rains subregion. Van Someren (1956) remarked that some Nairobi area birds breed in the little rains. Further data likely will show that breeding occurs during or following any one or all three of the rainy periods.

Specimen data. We netted 11 adults with sufficiently broad eye-wattles as to belong to this species (the wattles were obviously wider than the eye); these varied considerably. Two others, possibly intermediate toward *Z. senegalensis*, were narrowly yellow on the forehead with a moderately large orbital wattle and quite green upperparts and sides to flanks; one of these at NG escaped while being photographed, and the other was one of a nesting pair at MK 2 August 1989 (its mate, not netted, appeared typically *Z. senegalensis*), released quickly to avoid loss of the nest, which was abandoned anyway. See remarks under *Z. senegalensis* concerning variation in white-eyes. The 11 adults weighed 9.5–12 g (11.1 g); they had wings 57.5–65.5 mm (59.7 mm), and thus showed slightly greater weight and longer wings than *Z. s. jacksoni*. The data with overall color of the individuals fit well within *Z. p. kikuyuensis* (see Fry *et al.* 2000). Overall they showed less variation in color than did African Yellow White-eyes. No immatures were netted; these have a reduced white orbital wattle, rendering them readily identifiable in the field only when with their parents. The adults were in April–August; the one August individual was in mid-molt, and one (of six) May Montane White-eyes had the outer primaries incoming. Two May individuals and one from July had a

cloacal protuberance (weights 11–12 g, wings 58.5–62 mm), and a June bird showed a brood patch (weight 10.5 g, wings 57.5 mm). Soft-part colors: As described (Fry *et al.* 2000), but mouth lining in one (sex?) was black throughout.

Abyssinian White-eye Zosterops abyssinicus

Months. January, March–May, August, November–December; uncommon, possibly locally resident.

Ecology. Mapped by Lewis & Pomeroy (1989) as occurring across Laikipia Plateau, even breeding in quarter-degree square 50 D (which is mainly at 1700–1900 m, with *c.* 1650 m its lowest elevation), and supposedly occurring below 1800 m, this is our least common white-eye. We have found it chiefly about Mukutan River in the middle of the study area, from Mukutan Gorge E to GME, MB, and SI, at elevations of 1650–1950 m. As it can occur in mixed flocks with African Yellow White-eyes, we found it difficult to distinguish it from likely immatures of the latter, due to the Abyssinian’s yellow coloration, often pale, and particularly to its narrow, white orbital wattle. Observed with African Yellow White-eyes and sunbirds feeding at flowers of *Albizia gummifera* | *grandibracteata* in the lower Mukutan in January, with that same white-eye in a flycatcher-warbler mixed-species foraging flock at SI in December, and with Yellow-breasted Apalis in *Croton* sp. in May. We note that Stevenson (1980) listed only *Z. senegalensis* for Lake Baringo, which is at 970 m, probably in error, as Hartley (1986) had that species and the Abyssinian from lakes Bogoria and Baringo. It is uncertain whether Abyssinian White-eyes visit from lake Baringo, or are resident up to 1800–1900 m in the study area; it is resident, with Montane White-eyes, at a similar elevation around Nairobi (van Someren 1956). Possibly the occurrence in our area of the third species, *Z. senegalensis*, results in interactions favoring the latter over *Z. abyssinicus*. *Movements.* None noted, but a post-breeding migrant or wanderer in N Tanzania (Fry *et al.* 2000), and not present all year near Nairobi. Breeding is mainly during the March–June period about the big rains (van Someren 1956, Brown & Britton 1980, Fry *et al.* 2000), but Mackworth-Praed & Grant (1960) also had December–January records for the Kenyan highlands. Likely none of these reports deals with our triple-breeding-season subregion, nor adjacent lowlands. Its occurrence in January, March–May, August, and November–December could precede, or follow breeding nearby, or it may breed very locally in our study area but has been missed by us.

Behavior. Nothing added beyond what van Someren (1956, under *Z. senegalensis fricki* = *Z. abyssinicus flavilateralis*) and Fry *et al.* (2000) noted.

Voice. "Pit" and "zhaa" ("*Zosterops* note" of Horne 1987) contact and flocking calls were heard. A very yellow, narrow-eye-ringed bird sang a partly mimicked song with trills in it at MB 11 June 1989. Its songs are not easily told from those of Montane and especially African Yellow white-eyes. Likely also heard singing at MK in May, but African Yellow White-eyes and possibly Montane White-eyes also were singing there, and we could not ignore honeyguide studies to delimit their specific songs. Those observed at GMF appeared to be moving, as none were seen repeatedly. White-eyes with narrow eye rings gave buzzy trills, "tch-tch" notes, and "chips" and "eeps" with trills.

Breeding. Its known breeding efforts are cited above (under Movements), and refer to "highland" Kenya (despite its being a mainly lowland white-eye). We have no indications of its breeding in the study area, although it was found there within the two breeding periods noted for it above (March–May, December–January), and its occurrence in seven well-scattered months suggests that it could be resident, and thus breeding locally in small numbers.

Specimen data. We netted but three adults in August and November. These weighed 8.25–9.5 g (8.75 g), and two had wings 52.5 and 53.5 mm. These represent the yellow, often somewhat pale yellow *Z. a. flavilateralis*, with measurements that are low but fit those given by Mackworth-Praed & Grant (1960: 52–59); Fry *et al.* (2000) had 53–59 mm, and weights of 16 from Tsavo that, at 7.2–9.0 g, likely are lower than actual weights of the highland fringe population. The August bird was starting molt and one of the two November birds was completing its molt. Mackworth-Praed & Grant (1960), Zimmerman *et al.* (1996) and Fry *et al.* (2000) state or imply that there is no black on the lores of this species: however, Mackworth-Praed & Grant (1960) contained a photograph of this white-eye, taken from van Someren (1956), that clearly shows a black loreal line. In fact every species and race of *Zosterops* illustrated in Fry *et al.* (2000), and in Stevenson & Fanshawe (2001) has a black loreal line, including *flavilateralis*. Netted birds and those seen in the field showed this line, which can be obscured if surrounding yellow feathers are erected. Although less greenish than the other two white-eyes, its dorsal yellow is green-yellow, and it usually shows a dull green wash in the yellow of the sides and flanks, as illustrated in Fry *et al.* (2000). Given variation in

color of African Yellow White-eyes, and particularly immatures with narrow white orbital rings, it is difficult to separate these two species, as Fry *et al.* (2000) remarked. Identification is assisted by its usual occurrence in pairs; two yellowy *Zosterops* with narrow orbital wattles in close association with one another are apt to be Abyssinian White-eyes.

ESTRILDIDAE Waxbills, firefinches, mannikins, whydahs

Gray-crowned-headed Blackfinch/Negrofinch *Nigrita canicapillus*

Months. May, one record, Nglesha.

Note. As we were leaving for radio-tracking work on honeyguides 27 May 1989 at NG, the late D. Chepus reported finding a nest of this estrildine. A check showed us the bulky ball nest of fibers of bark and rootlets, leaves and fine grasses typical of the species (Jackson & Sclater 1938, Chapin 1954, Goodwin 1982) situated 3.5 m in a dense *Euclea* spp. in thick riverine forest and thicket. One adult left as we arrived; Chepus had seen both M and F near the nest, one going to the nest and the other coming out the (side) opening, suggesting incubation of eggs. We could not return until 28 July, when we found the nest virtually destroyed, with a partial leafy and fiber mass hanging in leaves of the *Euclea*; likely a mammalian predator had attacked the nest. This highland species occurs in Lewis & Pomeroy's (1989) quarter-degree square 50 C, immediately S of the study area, toward Nyahururu; it occurs down to 1700 m or less, so its occurrence is not unexpected. Our failure to see the species otherwise at NG suggests that this was a pair displaced from forest being cleared in the Marmamet-Ol Arabel Forest Reserve areas (which forest was connected with that at NG in the past century). One or both adults may have been taken by the predator at the nest; none was observed at NG thereafter. Breeding is within the period May–July given by Fry & Keith (2004).

Green-winged/Melba Pytilia/Melba Finch *Pytilia melba*

Months. May, June, August, December; casual visitor from Lake Baringo area.

Ecology. Seen five times, once five individuals; possibly locally resident as suggested by the more regular presence of its nest parasite the Acacia Paradise Whydah. Found at lakes Bogoria and Baringo (Hartley 1986), and occurs regularly to 1400 and at times 1800 m (Lewis & Pomeroy 1989, Stevenson & Fanshawe

2001). We have seen it at the acacia crossing (27 May 1996, 11 June 1991), SI (14 August 1990), and at TA 26 (May 1995, 24 December 1994), all at 1810–1900 m. The acacia-crossing birds were a F in acacias and undergrowth, and a M perched over the water. At SI a M foraged in bushes and under them on the ground, with a mixed-species foraging flock of warblers, bush-shrikes, babblers, finches and others. At TA 24 December at least three MM and two FF foraged among cut bushes and debris with cordobles and other finches; and on 26 May we netted a F there (see below). It feeds on the ground near or in cover, and also in trees and bushes (Goodwin 1982, Clement *et al.* 1993).

Movements. No information; conceivably resident locally in small numbers, but more likely a post-breeding upslope wanderer, individually, in pairs, or in small groups.

Behavior. The group at TA 24 December included two aggressing, supplanting MM, that chased each other short distances.

Breeding. We have no evidence for breeding in the study area, but secretive, could escape notice. Its propensity for occurrence in pairs (Goodwin 1982) makes it likely that the single MM at acacia crossing and SI, and single FF at acacia crossing and TA (26 May), were accompanied by a mate that we failed to notice. Fry & Keith (2004) give April–June and December–January for breeding in our region.

Specimen data. The F netted at TA weighed 14.5 g and had wings 58 mm, in the range of wing length given by Mackworth-Præd & Grant (1960) and slightly greater than F wing length provided by Jackson & Sclater (1938). The F was completing wing molt (outer primary in pin). Its head was gray, tinged green and had c. 10 hair-like filaments projecting to c. 4 mm above the rear of the crown and front of the nape; we find no mention of these by Chapin (1954), Goodwin (1982), and Fry & Keith (2004). Its breast was not barred, but had weak, pale olive-gray scallops, with barring on the sides and flanks, and a clear white center of the lower breast to belly (less clearly barred than shown by Zimmerman *et al.* 1996, near the F in van Perlo 1995 and in Stevenson & Fanshawe 2001). Its tail was entirely crimson, except for black shafts and brown-black inner vanes of lateral feathers. Soft-part colors: The bill was black-brown above with orange tip and along tomlia, and the mandible was orange with a reddish base. The eyes were bright orange with a hint of red; there is a narrow gray-white orbital ring of feathers. The legs were flesh-colored,

with some gray. These colors differ somewhat from those shown or described in Clement *et al.* (1993) and Zimmerman *et al.* (1996). The F appears to represent *P. m. soudanensis* (Clement *et al.* 1993; see also Goodwin 1982 and Fry & Keith 2004).

Cut-throat Finch/Waxbill *Amadina fasciata*
Months. April, July, September, November–January; casual visitor and breeder from lowlands to W.

Ecology. We have some 13 records in the above months during 1986, 1992, 1993, and especially 1994–1995; also reported (undated records) for the study area by S. Sassoon and C. Francombe. Supposedly a lowland finch (below 1300 m, e.g., Lewis & Pomeroy 1989, Fry & Keith 2004), but mapped by the former authors all across the Laikipia Plateau, and marked breeding in quarter-degree square 50 D, to our SE, which is mainly at 1700–1900 m and has no elevation below c. 1550 m. It is also reported from Pinguone at 1600–1850 m (Schulz & Powys 1998). Observed at scattered sites from other than the SE, between 1650 and 2000 m (last, of two MM, one F watering near a horse at NG, 18 November 1993). Other records are from about Center and at NP, where nests were found (see Breeding, below).

Movements. None noted, but casual, except for 1986 and 1994–1995, and likely visitor during good rains. Lewis & Pomeroy (1989) reported some movements, known to be erratic in southern Africa (Harrison *et al.* 1997), and to undergo movements in W Africa (Borrow & Demey 2001).

Behavior. See Goodwin (1982). Seems attracted by clusters of ploceid nests.

Breeding. None seen in September and December–January, at variance with the March–August and December nesting of the Cut-throat in our region, but not likely in our subregion, with its triple rains (Fry & Keith 2004). In September 1986 seven or eight pairs nested in old Red-headed Weaver nests scattered among branches of an *Acacia gerrardii*, 20 m from another tree with 10 nests of White-browed Sparrow-weaver at the NP site (at 1855 m). They seemed not to interact with the sparrow-weavers. In December 1994, near Center house kitchen, a pair nested in an old Red-headed Weaver nest in an *Acacia xanthophloea*; the nest had a long (for the weaver) tunnel, and the F was feeding begging young inside. The M was nearby and uttered (see Goodwin 1982) a weak warbling song. On 31 December the M was observed near the nest; a M Red-headed Weaver was constructing a new nest 4 m away. Three adults (two

MM, one F) fed in a garden at Center 5 January 1995, so there likely were other pairs nearby. We place *Anadina* here, near *Pytilia* and not near *Spermestes* or *Lonchura* following Güttinger (1976) and Baptista *et al.* (1999); see Sorenson & Payne (2001) and Fry & Keith (2004).

Red-billed Firefinch *Lagonosticta senegalensis*

Months. January–February, April–August, October–December; local, resident, mainly about habitation.

Ecology. Reported resident at Center, probably also at Kuti, and at the Education Center, but occasionally occurs at dams (Big, Titus) and at water present at acacia crossing, GMF, TA and MK. Numbers not more than 10, and usually up to five or less (as many as 35 can be seen about our Nanyuki bird feeders), and is outnumbered by the following species away from habitation. Forages on ground, often with other birds (e.g., estrildid spp., but also with chickens). Drinks regularly, bathes occasionally; a group seen over MB, probably en route to Titus Dam to drink. N of Kuti 22 July seen feeding in the road just S of a foraging pair of African Firefinches. In visits to GMF ventured through doorways, into tents and bandas, is very confiding.

Movements. Disperses, moves locally only.

Behavior, Voice. Very well known (van Someren 1956, Goodwin 1982, Clement *et al.* 1993, Maclean 1993, Cramp & Perrins 1994a, Fry & Keith 2004).

Breeding. Immatures observed February, July, and August, all at Center. Brown & Britton's (1980) records are for all months in our general region, with a large peak in big rains (April) and a tiny peak in November (little rains). About habitation could breed at any time, as grain is stored, distributed and fed to chickens.

African/Blue-billed Firefinch *Lagonosticta rubricata*

Months. Resident, occurs throughout, only locally common.

Ecology. Present about habitation, generally in smaller numbers than the Red-billed Firefinch, except more common at NG; also at most sites where open. Sometimes forages with Red-billed Firefinch, more often with cordon-bleus, other estrildids, and sparrows. Mainly feeds on ground, but observed frequently at the cut-out hive used in our honeyguide work at MK; fed in and near the hive, on insects or bits of beeswax. Flycatches during emergences of termites, less successfully than does Red-cheeked Cordon-bleu. Drinks at dams, streams, bird baths and puddles. Lewis & Pomeroy (1989) did not map it in our area (quarter-degree square 50 A), nor at 50 D, where it

occurs at Mutara (Olson *et al.*, unpublished MS).

Movements. Known to wander (Lewis & Pomeroy 1989), and seen flying over, into and out of our sites.

Behavior, Voice. Well known (van Someren 1956, Goodwin 1982, Clement *et al.* 1993, Fry & Keith 2004).

Breeding. Casual observations include a pair at GMF that copulated 13 times in succession 18 June, a F carrying a large feather in August, and an immature M becoming adult in November. Breeding in our region largely is in March–August (Brown & Britton 1980), thus in the big rains through to end of July–August rains; in our particular subregion the July–August period may be more important.

Specimen data. An immature M netted at PK 22 November 1994 weighed 9.5 g and had wings of 47 mm; its head was red-flecked on green. It represents *L. r. ugandae* (Goodwin 1982, Clement *et al.* 1993), merged into *congica* by Fry & Keith (2004).

Red-cheeked Cordon-bleu *Uraeginthus bengalus*

Months. All; with Yellow-rumped Serin, the commonest of finches.

Ecology. Ubiquitous, at all sites and in all habitats except the interior of dense woodland and forest; common at habitations, and especially numerous in bushed and wooded grassland and bushland, including degraded areas. With “yellowrumps” (Yellow-rumped Serin), this “blue-rump” is a conspicuous roadside bird. Feeds mainly on ground, on grass seeds, but also feeds in bushes at times (seen eating berries of *Carissa edulis*). Its long tail seems an advantage in hawking emerging termites, as it can swoop, twist, glide and persist in flight, taking up to three or four in one sortie. Usually in pairs, family groups, and flocks of up to 12, but movements occur when flocks of 100 or more are present in one area. Associates in flocks, more with Yellow-rumped Serins by far than any others, but also with much less common Purple Grenadier, and with drongos, babblers, buntings, other estrildines and serins, ploceids, petronias, and many others. Feeds in elephant dung. Widespread in Kenya, and certainly well above 1800 m (see Clement *et al.* 1993).

Movements. Moves locally, especially November–April, when large flocks are noted (also occasionally in July). Certainly far fewer present October–December in most years, and in March–April few may be seen anywhere; then they appear in large numbers along roads and at all sites. May move S into nearby agricultural areas after breeding.

Behavior. Quite well known (Goodwin 1982, Clement *et al.* 1993, Fry & Keith 2004). Very aggressive, often fighting at concentrations of food (bird feeders), may clasp and fall to ground. M may carry a feather or piece of grass about, pumping its head in display, even when F is not present (this and other displays are much like those of *Lagonosticta* spp.; see van Someren 1956). Goodwin (1982) described courtship, the M bounding over F and tail flicking; M may hop back and forth, jump over F, and repeat this, with cheeks puffed out, displaying the red patch. He may peck rump of the F; she then crouches, quivers wings and tosses her head back. The M then mounts her, beating one, then the other wing as he copulates.

Voice. Reasonably well known (Goodwin 1982, Clement *et al.* 1993, Fry & Keith 2004). Notes are generally high-pitched and of an ilk one tends not to notice. Has "chip," sibilant contact "tsee-SEEEEP," and alarm calls (see above references). Song high-pitched, a "se-swEEEE-zEEEE," or "sa-seee-tee-deEEEE;" at times more complex, longer (Fry & Keith 2004), but may also be short, a song-like call "seep-pseep" or "pwee-eeep." Sometimes it is uttered by the F (Goodwin 1982). Singing peaks in May–July (April–September), and December–January (or November–January); may start as late as late May of some years (1996). Data indicate concentration of songs (and birds) about water when dry, with dispersal all over when wet.

Breeding. Records for our general area (but doubtfully from our subregion) in Fry & Keith (2004) were March–October, with a decided peak in May, thus during big rains with a tailing off after July (19 of 30 records March–May, seven in June–July, the other four August–October). We had 22 nests and cases of nest-building, peaking in August, with a minor peak (two nests) in December–January. Copulations and MM with a cloacal protuberance were in June–July and December–January, and courtship was observed April–September. Fledglings were noted in April–August, independent juveniles August–December and February, and immatures going into adult plumage September–December. Breeding thus starts in big rains, peaks during July–August intercontinental rains and sometimes occurs late in and following little rains. This differs from the overall region's breeding and predominant March–July breeding about Nairobi (van Someren 1956). Of 20 nests we could measure 16 as to height: they were at 1.2–4.6 m with a mean of 2.33 m. The 20 nests were in acacias, mainly (*Acacia gerardii*: 12, *A. xanthophloea*: three, *A. abyssinica*: one, and *A. brevispica*: one); three were in a dense *Com-*

bretum molle, a dense *Rhus natalensis*, and an under-terminated bush. All were of typical grass construction (Fry & Keith 2004). Guinea fowl and francolin feathers were visible in several. We did not examine contents of most nests (three of which suffered predation anyway); of five in which we could see eggs, one had three, three had five, and one had three and several days later, five eggs. Most fledglings were encountered in ones and twos. Of four broods seen apparently with all fledglings in the group, one was of two, two of three, and one of five young. The clutch seemed to be three to five in most instances, as van Someren (1956) found.

Specimen data. We netted 23, including nine MM, 10 FF, and four immatures (three FF, one M). The MM weighed 8.5–11.25 g (10.5 g), and seven had wings 52–54 mm (53.0 mm) The FF weighed 9.25–12.25 g (10.9 g), and six had wings 51–54.5 mm (52.8 mm). Immature FF were 10–11.25 g, and the immature M was 11.5 g. Although of the race *brunneigularis* (Goodwin 1982, Fry & Keith 2004), we found the FF extremely variable in head color, some fully blue-faced, and others with blue-brown or brown there (similar variation is seen in Nanyuki). Soft-part colors: The bill is variable, MM having a glossy pink-rose to red-pink bill, with black or blue-black on the tomtia, tip, and sometimes the culmen and about the nostrils. Generally the F has a duller bill, more pink with dusky, black and gray. In immatures the bill is blue or gray with pink base, may look pink overlain with gray. The eye varies in color; in MM it is usually red to orange, brown in some MM; in FF, it is more often brown or orange-brown. Immatures have brown to red-brown eyes. Other colors are as in Chapin (1954), Goodwin (1982), and Fry & Keith (2004). Molt was variable. One adult M in December showed an arrest of the primary molt, with primaries 1–4 fresh, and the rest full but worn.

Purple Grenadier *Uraeginthus ianthinogaster*
Months. All; locally common, especially about gardens and lawns.

Ecology. It is much less common than the cordon-bleu and does not flock in numbers beyond *c.* 12 (more usually seven to 10) but is nonetheless widespread. A majority of observations were at seven sites with nearby humans, and water available, and perhaps half of the remainder were at or near dams and water crossings. Feeds on grasses, tall and short; attracted to low, dry grasses of lawns, jumping up regularly to reach the seed heads, and pulling them down. Also eats

insects, at times hawking termites as they emerge. It perches woodpecker-like, or cross-wise on vertical stems of plants with termite tunnels; pecks open tunnels and picks out termites and eggs for up to 10 min at a time. Drinks and bathes regularly. Joins in foraging flocks with other species, especially, of course, its commoner relative the Red-cheeked Cordon-bleu, and also Yellow-rumped Serin, other finches, babblers, warblers, drongos and bush-shrikes. Occasionally mobs snakes, but usually holds back from actively mobbing species, watches and calls. Often frequents burned grassy areas. More often stays close to cover than its congener. Although parasitized at nests by Straw-tailed Whydahs this species is more restricted and less common, and we have no evidence of it parasitizing the Purple Grenadier in the area. Indeed, Lewis & Pomeroy (1989) gave maps showing the grenadier in almost 50% more quarter-degree squares than those in which the two are sympatric (the whydah occurs in eight such squares where there were no grenadier records).

Movements. More common in some years than others; observed in October–November of only three years. May move locally more than does Red-cheeked Cordon-bleu.

Behavior. See Goodwin (1982). M displays, holding feather or grass blade, on the ground, as Goodwin noted. Much shyer than cordon-bleus.

Voice. Well-summarized by Fry & Keith (2004). Main song of M a trill, preceded (but not always, and sometimes followed) by soft, buzzy and sizzling notes; quite obviously these have a long-distance communication function in the trill, and a short-distance communication function in the soft notes. Usually only the hard trill is heard, sounding much like the song of the Black Cuckooshrike except that this is given in bursts of several songs, and the Purple Grenadier's is not. Goodwin (1982), following studies of others, considered this the main song. This was confused by Clement *et al.* (1993) with the second, more musical and warbling "Loud" song of *c.* nine notes (Fry & Keith 2004), apparently a M song but ascribed to MF by Immelmann *et al.* (1964), and Evans (1972). This latter was reported as the (only) song of this grenadier by Zimmerman *et al.* (1996). We have also heard the trill contact or alarm call (Evans 1972) and, from a bird released from the hand, a "che-weet, che-weet, cha-weet." Songs were heard March–August and October–January (about thrice as many in the former period than the latter), with peaks in April and July. **Breeding.** Of 20 nests for our general region (D, Brown & Britton 1980), 18 were in February–July

and 13 (65%) in March–May, exactly coinciding with the big rains. However, they likely had no records from our triple-rains subregion. We found only three nests, and saw two others being built, plus courtship displays (Goodwin 1982) and fledglings in April–August, so breeding in the study area occurs in and between the big rains and July–August rains. This is matched by the singing regime. Nests were in bushes (under 2 m high) at heights of 0.3–0.9 m, and were of grasses with some fibers, and feathers visible inside (we did not inspect them closely). Fledglings numbered one to three. Immatures seen in the field November–April included "subadults" with some of the head pattern of adults. However, juveniles without sexual indications, brown eyes and mainly black bills (see below, and Clement *et al.* 1993, Plate 50), essentially brown birds with a violet-blue rump, were netted February (one) and April (two). These bolster the suggestions from song October–January that some pairs breed December–January, although April individuals (23 April) may represent March breeding. Fry & Keith (2004) note an October breeding record.

Specimen data. We netted 13, six adult MM, three adult FF, one immature M, and the three juveniles noted above. One M at GMF 1 November 1992 could not be treated fully; it was molting into adult M plumage. The adult MM weighed 12.5–13 g (12.8 g), and three measured wings of 54.5–56 mm. The three FF were 11–15.5 g in weight, and only one was measurable (wings 56.5 mm). The three juveniles were 10–13 g. Adults were netted February, April, June, August and October, and fit no schedule; three August adults were starting molt, at mid-molt and ending molt, the February adult was in mid-molt, a June bird was ending its molt, and non-molting adults were in April (one) June (two), and October (one). As near as we could establish, these represent *U. i. hawkeri* (see Mackworth-Præd & Grant 1960, and also Goodwin 1982 and Clement *et al.* 1993), but this species is treated as monotypic by Fry & Keith (2004). The FF showed pure white or barely traces of blue in white of the eye-marks, though one showed mixed blue and white lores, but white otherwise in the facial-eye marks. We saw an albinistic M along the S border near PO, among three or four normally plumaged birds 2 January 1996. It was white on the rump, wings and fully below, with a ghostly tan-white hood and pale gray-tinted back; the tail was brown-black. Its bill was red. Soft-part colors: The bill was glossy pink-rose to orange in MM, with a white basal line around the bill. FF had an orange bill, at times with a black base of

the culmen, or a black tip and a white base-line only around the maxilla. That of juveniles was black with traces of pink or red about the base. The ring of orbital skin was red-orange or orange in adults, grayish in juveniles. The eyes were red or red-orange in MM, orange or brown-orange in FF and dark brown in juveniles. The legs were gray or brown-gray. These amplified restricted information in Fry & Keith (2004).

Yellow-bellied/Swee-Waxbill *Estrilda melanotis*

Months. April, July–September; casual resident or visitor, inconspicuous.

Notes. Observed but five times, but is inconspicuous in its highland habitat (Lewis & Pomeroy 1989). First seen at MK 3 September 1986 in bushes and on the ground near the river; we noted that it walks, at least at times, not reported by Goodwin (1982). On 28 July 1989 several were in bushes along a stream at NG. At MK 11 August 1989 four or five were foraging at MK with *c.* seven Common Waxbills in an open grassy area with nearby bushes; they moved upslope NW. On 21 July 1992 a family of two adults and three dark-billed juveniles (see Clement *et al.* 1993) fed in streamside bushes at NG, thus proving that it breeds in the area. Most breeding in our region “D” of Brown & Britton (1980) is in May–July. Also arguing for breeding is a singing M at TA 17 April 1993, giving a “eeee-seeeee” to “eeee-seeee-eee” song (see Goodwin 1982), unlike that in Fry & Keith (2004). It was in a bushy area being cleared for cultivation. This species is inexplicably uncommon on the Laikipia Plateau. Rendered as *Coccygia quartinia* by Fry & Keith (2004).

Black-headed Waxbill *Estrilda atricapilla*

Months. One record, August; a wanderer from upland forest.

Notes. We watched a black-capped, crimson-rumped, black and pink-red billed likely M for 10 min at LA (1755 m), just S of the Mukutan River, 29 August 1986. Although lower altitudinal limits were described as 2100 m by Lewis & Pomeroy (1989) and 2400 m by Zimmerman *et al.* (1996), Goodwin (1982), and Clement *et al.* (1993) gave 1500 m as a lower limit, and Stevenson & Fanshawe (2001) noted it as 2000 m. It occurs in the Nyandarua (Aberdare) Mountains just to our S; close by, remnant montane forest formerly connected with those mountains (and with Nglesha Peak) occurs above 2000 m in the Marmanet and Ol Orabel forest reserves. As the bird was ventrally gray, blackish and, on the flanks red, and the black cap extended nearly to the back, it was clearly of this species rather than a wanderer of Black-crowned

Waxbill *E. nonnula* from W Kenya. The Black-headed Waxbill is more a species of edges and wooded roadsides than is the more forest-inhabiting Black-crowned Waxbill (Chapin 1954). It was in a streambed with dense vegetation below a rock face, and foraged near but not among cordon-bleus. Fry & Keith (2004) separated E race *kandti* as a species, Kandt's Waxbill.

Crimson-rumped Waxbill *Estrilda rhodopyga*

Months. January, July–December; either resident in low numbers, or July–January visitor in small numbers.

Ecology. Seen during August–October 1986 and July 1987, in July 1996, September 1995, November 1992, and October–January 1994–1995. Mostly observed about the Mukutan River, but also at GMF, and acacia crossing, as well as once each at TA and NG, between 1740 and 2000 m (Stevenson & Fanshawe 2001 had it only to 1800 m), and seen several times at 1950 m near Nanyuki. Up to five were present about GMF November–January 1994–1995. Most observations were of watering birds. Foraged on the ground or low in bushes at edges of woodland and bushland, and along watercourses, often with Common Waxbill, and sometimes with cordon-bleus. Several times worked over the beeswax feeder at MK, and ate beeswax at least twice. Seen after weak July–August rains in 1987 and 1995, but other records were during and following average and above-average rains.

Behavior. See Goodwin (1982), Clement *et al.* (1993), and Fry & Keith (2004).

Voice. We have heard the “tchair” call of Goodwin (1982), and “psee-it” and “pseep” contact calls as this waxbill watered, presumably the “tyeck-tyeep” notes of Goodwin (1982: 169). We did not hear its song.

Breeding. Our only records are of two separate groups of two adults with two juveniles in each group at MK during September 1986. The young were dull, without the facial markings of adults (see Clement *et al.* 1993, Plate 44). A juvenile in one group was fed by both members of pair. Brown & Britton (1980) had but three records from our general region, “D,” two in March–April and one in August; our records reflect July–August rains breeding.

Specimen data. Two were netted, one adult in molt 26 August, and one in fresh plumage 16 November. Birds observed generally appeared rather pale for *E. r. centralis* (Chapin 1954, Goodwin 1982, Clement *et al.* 1993, illustrated by Zimmerman *et al.* 1996), but incoming feathers of the August Crimson-rump and the November bird were dark, as this race is supposed to be (fresh wing covert and crown feathers in

fact are brown with a greenish tinge). The molting August bird weighed 8 g, and had wings 43 mm; the fresh November adult was 6.5 g, with wings 48 mm. Soft-part colors were as in Chapin (1954), Clement *et al.* (1993) and Fry & Keith (2004), except that the black bill in both birds showed pink at the base of the mandible, and an orange-red tomial line along the maxilla; this tomial mark has not been described, and gives these waxbills the appearance of having the bill partly opened, perhaps bestowing an aggressive advantage on them in mixed estrildid flocks.

Common Waxbill *Estrilda astrild*

Months. All except March–April; resident locally, in small numbers.

Ecology. Seen most frequently at sites with water available; likely missed often, as it is inconspicuous when feeding, and study sites were too wooded for it. Requires water, morning and evening, and can be observed in numbers to 25 at water. Records at GMF (bushland, degraded woodland), where bird baths provided water, and at acacia crossing, where we had to slow to cross suggest that it is more common than records indicate. Forages in family parties or larger groups in low vegetation, herbs, bushes and grass, where not easily visible. Often with other estrildids, particularly Crimson-rumped Waxbill, firefinches, and cordon-bleus. Sometimes feeds in *Euclea-Carissa* bushes, and observed eating *Carissa edulis* fruits several times (fruits not mentioned for it by Goodwin 1982). It was observed only a few times in bushes about Center, so largely ignored gardens. Flocks fly fast and often quite far (over 500 m). Widespread (Lewis & Pomeroy 1989).

Movements. None noted. Apparent absence in March–April could be real; only observed October–February in five years, and certainly most common May–September.

Behavior. Very well known (van Someren 1956, Goodwin 1982, Clement *et al.* 1993, Maclean 1993, Cramp & Perrins 1994a, Fry & Keith 2004).

Voice. Both hard and soft “chip” notes have been heard (see Goodwin 1982, Clement *et al.* 1993). Songs are variable, but one commonly heard was “tzip-tzip-tzip-dee-di-di-dididdzzzz-zzz,” ending in a buzzy trill, unlike those shown in sonograms by Maclean (1993) and Cramp & Perrins (1994a), and different from those mentioned by above authors, Zimmerman *et al.* (1996), Stevenson & Fanshawe (2001), and Fry & Keith (2004). Songs were heard June–September.

Breeding. Breeding in our general region D (Brown & Britton 1980) was noted as predominantly in April–

June (40 of 56 records), with 51 of 56 records February–July. Our sparse evidence consists of a nest in July, carrying of nest material in August, courtship displays in August (allopreening, courtship feeding repetitively), and parents with fledglings in late June and July. These suggest a typical (for our subregion) late big rains (May–June) to intercontinental rains (July–August, into September) breeding regime. A ball nest was deep in a *Euclea* sp. at c. 3 m. Fledglings seem to be three to five in number. Those visiting the bird bath at GMF in June 1990 were comical, begging (and sometimes being “fed” water) from adults, bustling about, over and even on a parent, although already able to drink and (two individuals at least) bathe on their own. The black-billed, brownish juveniles soon drank on their own, and one afternoon they and the adults drank at c. 90 min intervals.

African Quailfinch *Ortygospiza atricollis*

Months. All but March, June; uncommon, local visitor, possibly breeds.

Notes. May occur regularly, and possibly breeds at the Nglesha water crossing and short-grass area S of Big Dam, where seen most frequently. Elsewhere, several were in short grass at EG 25 December 1989, a flock flew over NG 24 November 1988, and a single bird flew toward Nglesha over the fence N of the Main Gate 2 February 1995. Most often in small groups, but 15–25 noted at times. Forages in short grass and shallow water; seen hopping in water, taking insects there from. Also foraged in deep (up to 10 cm), densely vegetated (with herbs, grasses) old elephant tracks S of Big Dam. It is usually in monospecific groups; once drank with Yellow-rumped Serins. Reported near Big Dam 14 and 15 January 1982 by S. Sassoon and C. Francombe, and seen there in the 1960s by Horne. Not observed following the 1984 drought, until 1988, and missed in dry 1990 and wet 1997. On 18 July 1991 a M walked and hopped about a F at the Nglesha crossing; the head of the M was puffed out (feathers erected). The distinctive, tinkling call note (see van Someren 1956) is often the first indication of its presence. Those observed close at hand had fleshy pink legs, the MM with a red bill and FF with a brown maxilla and orangish mandible (Clement *et al.* 1993). Known to breed mainly during the big rains (Brown & Britton 1980), although, if the pair noted above were courting, could breed nearby during the July–August rains. Sorenson & Payne (2001) considered this genus to comprise one polytypic species, but see Fry & Keith (2004).

Pearl-headed Mannikin/Gray-headed Silverbill *Spermestes caniceps*

Months. February, June, September–November; vagrant from lower elevation to N and W.

Notes. One seen in EG 10 February 1988 and at NP 3 June 1991 (pair); reported in early September 1983, October 1980 and November 1979 by S. Sassoon and C. Francombe. This species, formerly *Lonchura griseicapilla*, now allied with Afrotropical *Spermestes* (see Baptista *et al.* 1999), was reported to 1650 m by Lewis & Pomeroy (1989), who mapped it across the Laikipia Plateau; it occurs at Pinguone (Schulz & Powys 1998) to our E, and is common to W about Lake Baringo (Stevenson 1980). Stevenson & Fanshawe (2001) gave 1900 m as its upper elevation. Spot-faced adults are highly distinctive. Sassoon (pers. comm.) reported the September 1983 adult associating with several African Silverbills. Those observed were feeding on the ground near or under bushes. They were at elevations of 1790–1860 m, EG being within 5 km of the 1650 m level along the Mukutan River.

Bronze Mannikin *Spermestes cucullatus*

Months. January, April–July, September–November; resident at NG, visitor elsewhere.

Ecology. Observed regularly at the NG site and between Nglesha farm and Nglesha Dam; otherwise occasional at Center garden, and noted at TA, Big Dam and in the Mukutan Gorge area. Flocking calls are distinctive, and buzzy flights of such flocks would not have passed unnoticed, so is likely a wanderer and visitor, as at Lake Baringo (Lewis & Pomeroy 1989). Often observed about dry grass near the water crossing at Nglesha; also feeds in pastures, and grass about dams. Drinks regularly, and mixes occasionally with estrildids such as Common Waxbills. Habits well known (Goodwin 1982, Clement *et al.* 1993, Restall 1996, Fry & Keith 2004).

Behavior, Voice. See references above.

Breeding. Nest seen with adults entering the side-entrance at 4 m in a dense *Euclea divinorum* at NG 12 September 1988. Two adults watered at NG, accompanied by three juveniles 18 November 1993. Brown & Britton (1980) had nests in all months from our general region, with a peak in the big rains. Sparse data suggest that, in the study area, Bronze Mannikins may regularly breed during and following the July–August rains, and in the subsequent little rains. Goodwin (1982) and Restall (1996) described breeding behavior and nesting.

Bicolored/Black-and-White Mannikin *Spermestes bicolor*

Months. June–August of seven years; local resident or breeding visitor, mainly Nglesha.

Ecology. See Goodwin (1982) and Restall (1996). Like the Bronze Mannikin this species was only regular at NG, where seen in seven years; possibly overlooked, but less frequently seen than the Bronze. Lewis & Pomeroy (1989) mapped it S of our study area, but across the Laikipia Plateau. May wander in from the highlands to the S. Perhaps more noisy than the Bronze Mannikin, and seen in groups and flocks of up to 30 or more. Often eats seeds of long grasses; *c.* 22 seen on the slope at UL, in *Combretum*-bushes grassland in July. Also favored bushy pasture grasses. Foraged at MK with cordon-bleus and Common Waxbills in tall river-edge grasses.

Behavior, Voice. See Goodwin (1982), Restall (1996), and Fry & Keith (2004).

Breeding. A ball nest was in a large-leaved tree at *c.* 5 m at NG 18 July 1993, apparently with eggs being incubated. At UL 8 August 1989 we saw three adults followed by two begging fledglings. We netted three subadults in molt at NG 27 August 1993 (probably too old to have come from the July nest). These suggest late June–August nesting during the intercontinental, July–August rains, or just before them. Brown & Britton (1980) had 50 records from our general area, but half were from Karen, near Nairobi, and few if any represented our subregion; they showed predominantly March–June, big rains breeding. Van Someren (1956), at Karen, noted breeding about that area March–August, with sparse nesting November–January. Nesting is well described by van Someren (1956), Goodwin (1982), Restall (1996), and Fry & Keith (2004).

Specimen data. We netted four, an adult at EG 19 August 1986 (fresh plumage, weight 8.5 g, wing 46 g), and three diversely plumaged immatures molting into adult plumage (weights 9.25–10.5 g) at NG 27 August 1993. Three of these, including the adult, showed chestnut on the back and wing coverts, the other being more rufous. The most juvenile-appearing mannikin, with mixed dull brown and black head, had started wing molt with primaries 1 and 5 (all others were juvenile, old feathers). A second bird had adult, new primaries 1–3, with 4 and 8 both coming in, the others being juvenile, while rectrices 1, 3 and 5 were juvenile, the others new. More advanced was the third bird, with adult primaries 1–7, and the tail freshly adult. Soft-part colors were those of the literature,

except: adult bill silvery gray-blue with blue-black tomia; the juvenile with least progress toward adult plumage had the bill horn-colored with blackish at the base and basal culmen; eyes were deep brown, except umber brown in the youngest of immatures.

African Silverbill *Lonchura cantans*

Months. May–September, December; casual visitor from lower elevations.

Notes. We have eight records, and Sassoon reported it in the study area in early September 1983. At least one was with other estrildids near our hive at MK 3 September 1986. Near the dam at LU 8 September 1986 we spied four in a bush with cordon-bleus and a young Straw-tailed Whydah; one of the silverbills perched beside the whydah and preened its neck. Others were seen at MK, MB, NP, NG, and EG. The two NG birds foraged near a stream with several Bicolored Mannikins. At MB 19 June 1989 a pair seemed to be attempting a nest at the top of a small *Acacia gerrardii*; one bird repeatedly carried grass blades to the other that wove and twisted them around foliage, but most fell, and nothing was seen of the “nest” or birds thereafter. The largest group observed was five. Brown & Britton (1980) reported its breeding in our general region March–August with a June–July peak. Lewis & Pomeroy (1989) gave 1600 m as its upper altitudinal limit, but Stevenson & Fanshawe (2001) had it to 1900 m and Restall (1996) noted it possibly to 2000 m, which it attained at NG. In the field it could pass as a generalized immature of *Spermestes* spp., except for its cordon-bleu-like long, black tail (and rump, plus vaguely spotted head). This species is placed in *Lonchura* following the work of Baptista *et al.* (1999); Fry & Keith (2004), put it in *Euodice*.

Village Indigobird/Steelblue Widowfinch *Vidua chalybeata*

Months. Only May–September; likely small numbers breed, especially in wet years.

Ecology. Only observed in six years, once in dry 1995, in 1986, an average year with strong July–August rains, and in wet to very wet 1989, 1996, 1997, and 1998. Mainly occurred in degraded, open acacia area N of Center, about Center including the airstrip and (degraded) Center South Dam; several times at MK and LA; once at MB, and once (M with five FF 14 July 1998) along a paddock fence at Nglesha farm (*c.* 2010 m, Fig. 4). Lewis & Pomeroy (1989) gave its upper limit as 1800 m, which it regularly exceeds in the study area and about Nanyuki. Stevenson &

Fanshawe (2001) reported it up to 2000 m. The acacia area N of Center is a notable display area of whydahs (see below), and there interacted, generally at edges of the area, with Pin-tailed Whydah in particular (also with Straw-tailed Whydah and Acacia Paradise Whydah). Feeds in low to moderately tall grass. Stevenson (1980) noted it as an April–September visitor at Lake Baringo.

Movements. None noted, but absent even in December–January, so presumably comes in as other whydahs, in April–May, and leaves September–October. MM seen almost entirely in breeding plumage.

Behavior. Much studied in terms of its brood parasitism by Payne (1973a, 1982, 1985a, b). Payne referred to sexual interference between species of *Vidua*, MM attempting to mate with FF of another species, bringing on attacks by MM of that species (Payne 1973a, 1980; Payne & Groschupf 1984). We observed Village Indigobird MM chased by MM of Pin-tailed, Straw-tailed and Acacia Paradise whydahs, at times with no FF visible nearby. On 28 September 1997 two MM Village Indigobirds and two MM Pin-tailed Whydahs vied for favors of a cluster of FF containing both species. The aerial displays of the various whydahs seem to render them dominant over the indigobird, and where apparently interspecific territories occurred, as at the Whydah Area, M indigobirds held fringe areas, in more bushy situations, and more nebulous territories, changing foci (singing perches and bushes) readily. One M at MK in an encounter with cordon-bleus spread its white flank-rump patches. Where seed-feeders were placed (about our former home in Karen), fully plumaged MM Pin-tailed Whydahs were dominant over MM of Village Indigobirds, but incompletely plumaged MM of the former, and those with broken central rectrices, were dominated by the M indigobirds.

Voice. Studied extensively by Payne (1973a, 1982, 1985a) and Payne *et al.* (1993), but in areas where this species occurred commonly with host Red-billed Firefinch. The firefinch is uncommon in the study area, and although seen at the same sites where indigobirds had been noted it was not seen when the indigobird was present. Red-billed Firefinches at Center (at which Village Indigobirds were never observed) could have been hosts of the indigobird without our knowledge. The firefinch was observed October–April, when the indigobird was apparently absent and firefinches were present yearly, including seven years when no indigobirds were noted. Thus, it is not surprising that we heard no firefinch elements in songs

of the indigobird (see also Fry & Keith 2004: 437). Most songs heard were interspersed with chattering trills, "tch-ch-ch-ch" to "ch-chchchch" with some songs simply "chip-cherp-chip-chip-cherp-chewp-chip-cherp," with F or FF near. Even simpler songs were heard at times, in addition to more complex songs, as "pitz, a-dee-dlee, pit-zew, pee, pee, pee-dle, ee-dee, brr-dee-dee, chip-er" and onwards. Some songs ended in a clear "-weet-weet-weet." Such songs were uttered continuously by a M in flight, "dancing" (much as in Pin-tailed Whydah) above the F, as if it possessed a dangling, long tail. Conceivably, some songs contain mimicry of the firefinch, but to our ears most did not (see Payne *et al.* 1993).

Breeding. We observed no juveniles, and have no evidence of breeding. Although this indigobird occurs up to 2000 m it is less common than at lower elevations. The Red-billed Firefinch occurs up to 2200 m and more, and is abundant about habitations at higher elevations, where Village Indigobirds are sparse or non-existent. The firefinch must be nearly free from the indigobird's parasitism in such high areas.

Specimen data. Only one was netted, a M weighing 12 g, coming into breeding plumage (brown flecks in rump, wing coverts), at MK 24 August 1986. Its bill was white with a distinct rose tinge, and its legs and feet were pale red-orange. We saw several singing MM with orangish bills nearly as bright as their legs, although most were white-billed. These seemed to represent *V. c. centralis*, perhaps tending toward *V. c. amauropteryx* (Payne 1982, Payne *et al.* 1993), with which our M agreed in weight (Fry & Keith 2004).

Steel-blue Whydah *Vidua hypocherina*

Months. July–September, January; casual, possibly breeds sporadically.

Notes. We have seven records of full-plumaged MM at Center, N of Center, the Whydah Area, and EG; MM also were observed in January 1982 by S. Sassoon, and C. and R. Francombe at Rhino Spring (Fig. 2) and near the house at Kuti. A M perched briefly on a wire at Center 4 July 1989. August MM were noted in a tree near the Whydah Area 4 August 1977, in the same area 15 August 1986, at EG 11 August 1987, at Center 18 August 1987, and in the Whydah Area 19 August 1995. One M was beside the road S of the Whydah Area, with 8–10 feeding, F-plumaged *Vidua* spp. (Pin-tailed Whydahs, possibly Straw-tailed Whydahs and Village Indigobirds flew as we walked up on them). Breeding-plumaged MM are very distinctive. Lewis & Pomeroy (1989) reported it up to

1400 m; breeding-plumaged MM are found uncommonly May–September at Lake Baringo (Stevenson 1980). Stevenson & Fanshawe (2001: 562) gave limits of 500–1400 m, and noted its "curious and patchy distribution." Our records are at 1740–1880 m, and MK site is within 2.5 km of the 1600 m contour W of us, toward Lake Baringo, no distance at all for such birds. In any case, if a breeding visitor to the Baringo area, this implies movements easily encompassing the study area (see Lewis & Pomeroy 1989, Zimmerman *et al.* 1996 for movements). This whydah has been studied by Nicolai (1989); see Johnsongard (1997), and Fry & Keith (2004).

Pin-tailed Whydah *Vidua macroura*

Months. All but February–March; the commonest of the *Vidua* species, but often absent.

Ecology. A well-studied *Vidua* (see citations Barnard 1998, Davies 2000, Fry & Keith 2004), although most studies from where the whydah and its hosts were common. Although reasonably common in the study area (its *Estrilda* spp. hosts were less common, see above), and observed yearly, it was more common in some years than others. Only three major display sites were regularly in use, and in only seven years (1986, 1987, 1989, 1994–1997); at least 11 additional sites were used in years of good rainfall, and the birds were observed sporadically passing over or in other sites. Noted at seven of our sites, but only regular at NP, in degraded acacia woodland/bushland with grassy areas when rains were good. The much-used Whydah Area was another degraded bushland/woodland site, frequented by browsing and grazing mammals and sometimes livestock. The lower airstrip at Kuti was third regular site in short grass on the strip and adjacent degraded woodland/bushland. All major sites were near water. Other sites used at times were in well-grazed areas beside dams (e.g., Titus, Big, Center South, Nglesha dams), tanks (OD tank, Kuti tank, Nglesha farm tanks), or streams (Rhino Spring, Ol ari Nyiro Spring). At most sites, only one M was present. Pin-tailed Whydahs seemed "pushed" to fringes of areas when several Straw-tailed and Acacia Paradise whydahs were present. Peak months were July and August, followed by September, then June, then May; there were but seven records in October, and seven in April. We surmise that continuity of big rains (April–May), however much the rainfall, into and through the more regular July–August rains, is of paramount importance for breeding of this whydah in our area. Mostly feeds in short grass around the display

territory (which in Karen consisted of a bird-feeder, the ground beneath it, a bird bath 7 m away, a tree, and several bushes, all within a 10-m-diameter area). FF, immatures and MM coming into breeding plumage may use lawns, gardens and open areas well-trampled by livestock or game mammals in foraging. Sometimes in open areas far from perches (trees, bushes, fences). Forages in cornfields and hayfields and seen eating seeds of Rhodes grass *Chloris gayana* at NG. Forages with other species of *Vidua*, with cordonbleus and Purple Grenadiers, as well as Yellow-rumped Serins and such seed-feeders as Ring-necked Dove.

Movements. As many as 30 seen flying over sites in late September, but we have no direct indication of movements beyond the fact that we have but six records in five different years of Pin-tails from November–March. All records for October–April are fewer than those of say May, or September.

Behavior. Probably the best known whydah; see Payne (1971, 1973b, 1980, 1982, 1985b), Shaw (1984), Barnard (1989, 1998), and Savalli (1990), summarized by Johnsgard (1997) and Fry & Keith (2004). Most studies were conducted where this whydah and its hosts were common residents. The most frequent host in our study area, the Common Waxbill, is not common and unobserved at most *Vidua* display sites; it is difficult to account for the usual abundance of this whydah May–September. We found some time to observe and photograph this and the other whydahs; and also observing a M at a 200-m² display site about our former Karen home September–January 1989–1990. This latter site provided information on interference competition (Savalli 1990) and defense of the seed resource as a critical aspect of the display territory. In such situations food (seeds) is localized, visiting F conspecifics can feed readily, and most other small seed-eaters are physically kept away, hence food is not superabundant and accessible; see Payne (1980). When the M was present near the seed-feeder, it was able to displace and keep away various species, including M Village Indigobird, FF and immatures of Baglafaecht Weaver, other weavers, serins, sparrows, a bunting, estrildids, and even Red-eyed Doves among seed-eaters, and sunbirds and bulbuls foraging near the feeder. Only M of Baglafaecht Weavers, sometimes MM of Village Weaver, and a pair of Northern Gray-headed Sparrows generally were able to withstand the Pin-tail's attacks, or they regularly returned after being chased. Likely the M Pin-tail benefited from habituation to human presence and activities, giving it an advantage over most competitors about the seed-

feeder. We moved the seed-feeder about the small garden several times; each time the M Pin-tail maintained its song-perch acacia, the water bath remained in use, but its attention refocused on defending the (newly positioned) feeder. We thus agree with Barnard (1989, 1998) and Savalli (1990) that food resources can be a very important aspect of the Pin-tailed Whydah's display territory, and with Savalli (1990) that interference-competition is significant in keeping seed resources available to the whydah and potential mates. By making it "difficult" for other granivores to feed, those competitors generally left to feed elsewhere; even the sparrows that stayed were forced to feed intermittently. Under these ideal situations the Pin-tailed Whydah is able to court and breed, feed with his FF and drink within one-twentieth of a ha. Shaw (1984) described several courtship displays, but not aggressive displays. An aggressing M Pin-tail (on ground or perch) erects the white wing coverts and back feathers, thrusting them forward, the tail goes forward (over the head), where it dangles or is held erect, the bill down, the (white) outer tail opened wide and flicked closed; the wings are thrust in front of the body showing erected white coverts of the upper side and flashing white underwings from the lower side. The black crown feathers are erected, until the actual attack, when the plumage is sleeked. In supplanting or chasing flight (attacks), legs dangle, the white outer tail is spread, wings are maintained forward as much as possible (white areas conspicuous), M hovers over the opponent with wings forward, bill down, long, black tail feathers flowing about the white, spread outer tail, and the opponent is pecked or simply thrust away by the M's wings. Male Pin-tails also flick the wings, and bill-wipe aggressively (Shaw 1984).

In display to a F from a perch the M usually holds the black crown smoothed and erects the white neck and face feathers into a ruff, giving in frontal view a broad ruff around the head with black in its upper center and the red bill pointing somewhat downward. This is highly conspicuous, and the exact opposite of the displaying M Straw-tailed Whydah, with its smoothed pale crown, black facial-neck ruff and red bill. Usually the white outer tail is closed upon the long, black central feathers, but the tail may be flicked open-closed, perhaps an aggressive element of the courtship. The M shakes its wings (Shaw 1984), and also its tail and body, the tail dangling from side-to-side at the rear. The body and head are forward, the body somewhat vertical. At times the head pattern of



FIG. 21. Displaying M Pin-tailed Whydah *Vidua macroura*, wings closed position, over F in top of an *Acacia gerrardii* in a display area near LU 8 September 1986. The M sings and circles the F, tail dangling, often toward her; this shows the dangling tail and M facing the F directly (see text). Compare M head, the white feathers encircling the black "cap," with the reverse-patterned Straw-tailed Whydah in text.

display is reversed briefly, the crown erected and the neck and facial feathers smoothed. Prior to courtship dances the M may zip back and forth in front of the F, giving her a full lateral view. In the hovering dance the feathers are all held slightly erected, the wings beat, facing the F and the legs and toes dangle. When the wings close the body of the M is nearly vertical, it "stands" on its tail before the F, head and bill facing her (Fig. 21). It can conclude the dance, still hovering, by backing away, facing the F, and not flying away to one side. The F may respond, if so inclined, by shivering (Shaw 1984), fluffing her plumage, cocking the tail, and spreading the undertail coverts; copulation may then ensue. Some displays were conducted in large grassy areas and bare ground, with no nearby perches. The M seems to employ its tail more than does the Straw-tailed M, and it displays more often away from perches.

Interactions with other whydahs were frequent. The Straw-tailed MM seem to keep Pin-tails at the fringe of the display area. The Pin-tail displays from

smaller trees and bushes. M-M chases with Straw-tails were common, especially when FF were present (both whydahs display to FF of either species). We observed only two attacks by Pin-tails on displaying Acacia Paradise Whydahs, but in both cases the latter returned and continued displaying. On the few occasions when a M Village Indigobird was present conflicts occurred, the Pin-tail being dominant. Interactions were roughly in proportion to the abundance of species of *Vidua*, the Pin-tail being commonest and most widespread, Straw-tail often common at the display sites, indigobird less common but found on its own as well, and Acacia Paradise least common, frequenting fewer display sites and in fewer years. We observed a M Pin-tail displaying to a F Chestnut Weaver, and several times to a lone Yellow-rumped Serin, as well as over mixed groups of serins and F (by plumage) *Vidua* spp. One displaying M Pin-tail was attacked and chased from its area three times by a Plain-backed Pipit. One or several FF of the Pin-tail may join a M in display flight over its territory; three FF switched places back-

and-forth alongside a flying, displaying M, and once one F accompanied a M for 20 s as it displayed, flying alongside it, moving up and down and circling with it, and circling it when it hovered.

We view the interspecific encounters among the whydahs as sexual interference in the sense of Payne (1980, 1985b). Since MM of the various species of *Vidua* court FF interspecifically, aggression directed against other M whydahs tends to keep the latter from gaining access to FF on a M's territory.

Voice. Male Pin-tailed Whydahs do not mimic songs of their hosts, unlike most whydahs (Payne 1982). The M has various calls (Maclean 1993, Fry & Keith 2004), basically "chip"-like notes. In attack utters a fast chipping trill. The song is variable, fast and not very loud (audible to 50 m, Shaw 1984; does not sing and display in strong winds). Shaw (1984) distinguished aggressive songs as "quiet canary-like twittering" (Shaw *op. cit.*: 466), and courtship songs, monotonous, repeated "whit" and "chee" notes, with short, warbled phrases. Some fast songs are a rapid tinkling for less than 2 s. Many are rhythmically uttered, up-down, in quality. A "psit-tseet-sit-psit-pseet-sit" could give way to "pee-pee-peedley-tee-tee." Some songs are interspersed with "brr-r-r" or "pdt-dt-dt-dt" mechanical sounds, likely of wing-flipping or bill-snapping, and somewhat *Batis*-like. Overall, M Pin-tails utter a weaker, more mechanical song than Straw-tailed Whydahs, but Pin-tails more frequently sing on the wing. It sings from dispersed song sites (Barnard & Markus 1989) that may be contested with conspecific MM and Straw-tails. The height of the perches used for singing is lower than those used by Straw-tailed Whydahs, and both lower (in open areas with low cover to 1 or 1.5 m) and higher (in our Karen garden at 6 m and more) than the 2.8–5 m noted by Barnard (1989). Songs and displays were noted on 100 days (likely on other days, but if we could not stop to look and listen, we did not count the days, even when we saw the whydahs), 58 in July and August, 17 in September, 14 in June, and seven in May (three also in April, one in October), with the peak averaging in late July.

Breeding. Copulations and attempts at copulation date July–September; displays peak at the end of July, with 90% of the songs and displays June–September. MM in full breeding plumage have been observed April–October. Immature-plumaged Pin-tails have been noted July–October, but we could rarely check non-breeding-plumaged groups and flocks carefully, so have no numbers. A majority of Brown & Britton's

(1980) records for the overall region were in April–May, and Fry & Keith (2004) note April–July, which is not reflective of the situation in our subregion, where breeding seems centered upon the July–August rains, and commencing after the earlier big rains of April–May. This matches the June–August breeding of its local host, the Common Waxbill; no other *Estrilda* is common enough to be used regularly by the Pin-tailed Whydah. The Common Waxbill was observed less often than the Pin-tailed Whydah, and at sites where we largely found no whydahs (as in the MK-EG area, and at GMF, where one whydah was seen). No Common Waxbills were observed around the three main whydah display areas, although the watering site for the Whydah Area whydahs, the acacia crossing, was used by watering and feeding Common Waxbills. We have no records of whydah hosts of this waxbill, or of any waxbill.

Straw-tailed Whydah *Vidua fischeri*

Months. April–October, December; less common than Pin-tailed Whydah, as breeding visitor.

Ecology. Common at display sites, including open areas near small dams (which held the territory of only one M whydah, generally either of this species or the Pin-tail), in years of good rainfall, but otherwise sparse. Recorded in all years except 1985 and 1991 (only once each in 1993 and 1995); however present in only two years in each of April, May, October and December, in three years in June, and during six or seven years in each of July, August and September. In 1992 it was present July–October and in 1997 in June–October; during 1994 it displayed only April–July, and it left by late August of 1987, 1988, and 1996, but only appeared in August of 1986. For display areas it favors low grass with scattered bushes and trees, higher on the average than those used by Pin-tailed Whydahs. Both whydahs were seen at many of same sites except that no Straw-tails were observed in Nglesha area of the SW; seen a few times at small dams near 2000 m, and once overflying the Main Gate near 2020 m; but other sightings were at 1950 m or less. We often see non-breeding Straw-tails at Nanyuki (1950 m). Zimmerman *et al.* (1996) suggested 2000 m as an upper limit; Johnsgard (1997: 304) gave 1500 m and falsely stated that Straw-tailed and Pin-tailed whydahs had "nonoverlapping" distributions (maps in Stevenson & Fanshawe 2001: 560 show broad overlap). Once seen at main airstrip on the plateau in the E, singing and displaying in herbs less than 1 m in height (no Pin-tails present), and

watched feeding on Rhodes grass *Chloris gayana* seeds. Associates readily in mixed flocks with other whydahs, serins, cordon-bleus and doves. Drinks, probably frequently, at streams, puddles and dams.

Movements. Flocks seen in December 1987, and 1988, with mixed *Vidua* spp. and cordon-bleus; none in breeding plumage. Mixed flocks in April likely were incoming. Departing flocks not observed (as many as 20 may fly over or away to drink in July–August), indeed, seemed to simply disappear August to October. We believe it to be absent in (dry) January–March and, in most years, October–March. Numbers fluctuate at Lake Baringo (Stevenson 1980).

Behavior. Somewhat well known (Nicolai 1969, 1974; Payne *et al.* 2003). As noted for the last species, M display colors of head plumage are reversed in Pin-tailed and Straw-tailed whydahs, the M Straw-tail employing a pale (yellowish to buff) crown and black neck-facial ruff, as well as buffy white (*vs.* black in Pin-tail) central tail feathers and dark outer feathers. These suggest strong interactions of MM of these two whydahs in terms of sexual interference (Payne 1980, 1982, who noted that the M whydahs court small brown birds, especially all FF of *Vidua* spp.). The larger Acacia Paradise Whydah also interacts with Straw-tails, but is less common, and few of its FF were observed. Where all three were present, as some years at NP and the Whydah Area, there was usually a single M Acacia Paradise Whydah, several Straw-tailed Whydah MM on territories about the center, and one or more M Pin-tailed Whydahs at the fringes. Compared with M Pin-tailed Whydah, the M Straw-tail is less aerial, sings more from a perch and less in flight, displays generally higher, in higher bushes and trees at 2–5 m, except used herbs and very low bushes at 0.8–1.5 m about the Kuti airstrip display area (where only other whydah was an occasional M Pin-tailed Whydah). In display to FF from a perch, the M erects its ruff around its yellow crown and pink-red bill (the ruff often extends over the crown and is visible there from the front), lowers the bill somewhat, stretches high on pink-red legs and beats its wings, facing the F (or occasionally a F Chestnut Weaver, or Pin-tailed Whydah, or Yellow-rumped Serin). The M bobs up and down, sometimes lifting off the perch, its wings beating and tail lashing up, down, sideways and over its head. The outer, blackish rectrices are spread, “straw” tail lashing above them. We have seen M Pin-tailed Whydahs occasionally stretch and beat the wings (they stretch on black, not reddish legs),

but infrequently, and never as “enthusiastically.” FF respond by wing-quivering, erecting feathers generally, cocking the tail with undertail fluffed and crouching; copulation ensued, but in one case the M, as it mounted the F, was bowled off her by an attacking M Pin-tailed Whydah (truly sexual interference), that was then chased by the Straw-tailed M.

The M also flies in display flight from one bush to another, tail dangling and moved up and down. A M may fly to a bush or tree on the territory of another M if the latter is away, displaying there. Display usually did not occur early, when whydahs were feeding and watering, but often took place through midday and the afternoon heat. MM interact with plumage smoothed, bill-wiping, then attacking and chasing an opponent, or flying at it (or at a displaying M Pin-tailed Whydah or Acacia Paradise Whydah). Two M Straw-tails sometimes displayed flying parallel and whipping their tails side-to-side, not up-down. These ended with one M zipping back into its territory and singing, or in attacks and chases. We had as many as five MM within 1.5 ha at Kuti on display territories, and three each at NP and Whydah Area (*v.* usually none to two *V. macroura* at Kuti, one to five at NP, and one to three at the Whydah Area). Most displaying at other sites was not sustained, although some FF were present. Effective display territories with one M only were at Titus Dam, a pasture SW Kuti, Posho Corner, a small dam near LU, Center South Dam, Rhino Spring, and Cement Dam (see Fig. 2); these were not utilized annually, and in years with few display territories the three main areas were those occupied. One in non-breeding plumage was preened at LU 8 September 1986 by an African Silverbill.

Voice. Calls “tsip” to “chip,” and “tseet,” often doubled. The song, usually uttered from a perch, but also in flight display is more complex than that of Pin-tail, and it raises some problems. We have not found that it regularly mimics the song of its preferred (supposedly only) host, the Purple Grenadier (Nicolai 1974, Payne *et al.*, 2003). Goodwin (1982) reported the M Purple Grenadier’s song only as a pure, hard trill we have not heard from Straw-tailed Whydahs. We have not heard grenadier song mimicry as such, certainly not the loud song and trill song described in Fry & Keith (2004: 433–34). Nor did we hear Straw-tails singing the two mimicked songs of Zimmerman *et al.* (1996). Perhaps our Straw-tails use mainly non-mimetic song (Fry & Keith 2004) with

so few Purple Grenadiers in the study area, or possibly other hosts are used. We heard such songs as: "tsa-weet, tseet, seechee, tcha-weee, eet-sa, tsee, treeeeeee-eeeeer," and "weet-tseee, see-chip, tseet, tsa-wee, eee-eeeeee." The Kenyan range of Straw-tail in Lewis & Pomeroy (1989) is in 67 quarter-degree squares; in eight of these Purple Grenadiers were not known to occur, whereas the latter occurred in 31 additional such squares (only 46% of the total squares occupied by *fischeri*) where the Straw-tail was unreported. In the study area the grenadier occurs at sites, particularly along the Mukutan River and its drainage, about Nglesha, and at SI, PO, and other S sites, where Straw-tailed Whydahs were not observed, or occurred only sporadically. Only once did we see Straw-tailed Whydahs with Purple Grenadiers (and other finches). *Breeding.* We have no records of this whydah parasitizing any host in the study area. Among Straw-tailed Whydahs copulations were noted July–September. Songs and displays were observed on 84 days, peaking in August (76 or 90% were in July–September), with a few in May (three) and June (five). Some immatures were seen casually in "female" flocks August–September. Brown & Britton (1980) had records April–June, Johnsgard (1997) noted breeding March–May in Kenya, and Fry & Keith (2004) had no records from central Kenya. In our triple-rainfall sub-region, breeding clearly is during and after the July–August rains, with perhaps some breeding occurring between the big rains of April–May and the start of the July–August main breeding period. Territories of MM averaged 0.2 ha, and were irregular in shape; some were linear, e.g., along one side of a road, with another M and a M Pin-tail on the other side. They were plastic, shifting with the season, and as other MM came and left.

Acacia/Eastern Paradise Whydah *Vidua paradisaea*
Months. June–September, December, 30 records; irregular breeding visitor.

Ecology. Noted in seven years (also observed prior to the study by C. Francombe, undated M at Rhino Spring, and by Short at the Whydah Area 4 August 1977), and only once in four of those. Groups seen in flight (e.g., over Kuti 21 June 1989, two separate MM each with three or four FF or non-breeding MM going NE; and S of PK 10 June 1992, the only 1992 record) and feeding. A partially breeding-plumaged M was with three FF and some Pin-tailed Whydahs in grass SE Big Dam 20 June 1997, and a mixed *Vidua* flock (non-breeding *paradisaea* and *macroura*)

fed at the Whydah Area 17 December 1986. Its presumed host Green-winged Pytilia (Nicolai 1969, 1974; Barnard 1989, 1998; Johnsgard 1997; Davies 2000) has been noted but five times in five years; in three of those years we saw no paradise whydahs. In 1994 we observed Acacia Paradise Whydahs in two places on 10 July, and saw several Green-winged Pytilias on 24 December, but no others of either species. In 1996 a M Green-winged Pytilia was at the acacia crossing 27 May, and the only paradise whydahs seen were three in non-breeding plumage 19 August. In 1986, 1989 and 1997, when we had the bulk of our paradise whydahs, we saw no pytilias. Both nest-parasite and host are usually at lower elevations (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996, Johnsgard 1997), with paradise whydahs more regularly at higher elevations. We saw pytilias as high as 1900 m; one display area of paradise whydahs in 1986 was at NP, elevation 1850 m (Stevenson & Fanshaw 2001 noted it to 2200 m). All display areas of Acacia Paradise Whydahs were shared (at one time or another) with Pin-tails and Straw-tails.

Movements. The lack of January–May and October–November records, with but one record in December, indicates movement into the area in favorable years, and through the area to other locations in years when it was observed but once. Movements are known elsewhere (Stevenson 1980, Lewis & Pomeroy 1989).

Behavior. Of the 30 days in which it was seen, 17 were display days (on some days seen displaying several times, and in a few cases at two sites), 15 of them in August–September 1986. Displaying MM (of which there were no more than two, and usually only one per site) used several song perches over a long (150 m) and usually narrow area of open grass, bushes and scattered trees. Attacked by M Straw-tailed and Pin-tailed whydahs, and returned the attacks; also, once attacked a singing M Village Indigobird, supplanting it. Attacks by the others usually followed overflight of a song perch of one of them. The paradise whydahs were no match for the faster, more agile and smaller Pin-tails and Straw-tails, but the first did not flee, and only directed their display flight away from the others. The paradise whydahs persistently returned later to the sites of conflict. When the M paradise attacked any of the others they fled, the paradise being dominant. A M presents a pattern to the front that differs greatly from the other two whydahs sharing its general display areas in showing an all-black front of the head and black bill against a chestnut breast. Usually perch-

es where its tail is visible laterally (it turns the tail as it sings, and the wind blows it one way and another). It does not grasp its perch and pull upward, as does Straw-tail, and sometimes Pin-tail. Its rather slow display flight with unique long tail trailing is higher than aerial displays of the other two, and the paradise flies long and straight, then perches and sings, or turns and comes back, singing in the air. Sings at FF of its own species and of the other whydahs. Display areas were the Whydah Area and NP; also displayed W of Kuti (where livestock and game mammals kept the grass low), near Posho Corner, near Big Dam, and once over the Kuti airstrip display area. No satellite MM were seen (Barnard 1998). Its display flights allowed it to effectively control a large grassy feeding area for whydah FF; it dropped onto any M whydah feeding in the grass with FF. Once two MM Açacia Paradise Whydahs flew in display at one another (over 250–300 m), tails dangling, and a F flying to one side of one M. The F dropped down, followed by the first M near the end of its display area, and the other M turned and flew back the way it had come, in display flight.

Voice. Discussed by Nicolai (1969), Payne (1980), Johnsgard (1997) and others. Songs are complex and resemble (show shared notes with) those of Green-winged Pytilia, with as many as 56 note-types in songs of paradise whydahs in one area (Payne 1980). In attacking the M Village Indigobird, a paradise whydah sang a simple “shiz-shiz-shiz” song. The 17 “display days” (see under Behavior above) were in June (one), July (one), August (seven), and September (eight), and included singing, as well as multiple sites some days, and up to 2 h of observations at times.

Breeding. We have no evidence of the pytilia breeding. Displays of its nest-parasite *V. paradisaea* MM to conspecific FF were relatively few and poorly seen, with one August copulation noted (displays to smaller FF of *Vidua* spp. were as common as to FF of *paradisaea*). With displays mainly in August–September, it would appear to breed in the July–August rains and thereafter (five Brown & Britton 1980 records, all in June, Fry & Keith 2004 gave June–July). Inferred breeding October–March (MM in breeding-plumage) by Johnsgard (1997) is erroneous; we saw breeding-plumaged MM no earlier than 10 June, and on through September, and at nearby Lake Baringo Stevenson saw breeding-plumaged adults May–August, and in wetter years, on to October. How much breeding actually occurred is uncertain, in view of the lack of its host in the study area.

PLOCEIDAE Weavers, buffalo-weavers, queleas, bishop, widowbirds

White-billed Buffalo-weaver *Bubalornis albirostris*
Months. November, one record near end of major drought.

Notes. Two black, black-billed, thick-set buffalo-weavers showing blotchy white on the sides, below the bend of the wing, fed with Red-winged Starlings at the edge of the Mukutan River at MK 7 November 1984. Apparently represents an upslope wanderer from the Lake Baringo area, where common (Stevenson 1980). Usually below 1200 m (Lewis & Pomeroy 1989) or 1300 m (Stevenson & Fanshawe 2001), but postbreeding birds wander, at least to the extent of a short movement up the Mukutan River to the site where seen, at 1750 m.

Red-billed Buffalo-weaver *Bubalornis niger*
Months. May–June 1996; rare wanderer from lower elevations.

Notes. Seen on three dates in 1996, after very dry 1995. A subadult M, brown and black above, white below with black breast streakings, streaks on the flanks and showing some white edging in the wings, had a horn-pink bill. It fed on and near the ground among 20 or so Chestnut Weavers in open bushland near the Education Center (NW of Big Dam) 15 May. Later that day, below Big Dam, an adult M foraged at the edge of cultivation; it was in typical black and white plumage with a pink-red bill. On 20 May the same or another adult M foraged with Chestnut Weavers E Posho Corner; it fed on buds of small *Açacia gerrardii* trees, and showed its white wing patches as it moved from tree to tree. Its bill was less red, more pink, perhaps, than the M of 15 May. On 1 June N Kuti at the base of the road E to Kuti Hill and Ol Doinyo Oirua we observed a pink-billed M, likely that of 20 May, foraging with a mixed starling (glossy starling, Wartled Starling) flock, mainly on ground amid low bushes where buffaloes and impalas had been feeding when we approached. While mainly a bird of elevations below 1500 m (Lewis & Pomeroy 1989), it is known in the Nanyuki region and in quarter-degree square 50 D, above 1550, and mainly above 1800 m. Our sightings were in the 1800–1880 m range, and likely were of post-breeding wanderers (breeds March–May, Fry & Keith 2004).

White-headed Buffalo-weaver *Dinemellia dinemelli*
Months. June, one record; vagrant from lower elevations.

Notes. We watched a single individual of this unmistakable species among queleas and Chestnut Weavers

feeding and drinking at the acacia crossing, 1835 m, 10 June 1994. It fed on the ground, clambering among waterside debris, for 10 min. Lewis & Pomeroy (1989) gave its occurrence as below 1400 m (a level reached a few km W of the study area along the Mukutan River), but showed it in the Nanyuki quarter-degree square (51C) and in uplands S and SW of these, the three squares involved averaging 2000 m in elevation. Wanders, according to Britton (1980). Breeding records in our region were mainly (31 of 35) during July (Brown and Britton 1980); at Lake Baringo breeding is in April–August (Stevenson 1980). The bird observed could have been a pre- or post-breeding wanderer.

White-browed Sparrow-weaver *Plocepasser mahali*

Months. All but February, October–November; resident only at Center.

Ecology. Bold, usually social weaver, resident in varying numbers at Center (*vide* C. Francombe). Also breeds sporadically in NP. Otherwise observed only at PK (twice), Olari Nyiro Springs (once), feeding about the staff houses at Kuti (once, eight-ten), and one by a tank under trees N Kuti watching a Northern Wheatear. Thus it wanders, and hence is not resident about all nesting sites, as it is elsewhere (see, e.g., Tarboton 2001). The sites are at 1820–1925 m; Lewis & Pomeroy (1989) had it at 400–1400 m, but also to 1900 m, and mapped it throughout the Laikipia Plateau, and indeed throughout the central highlands (see Stevenson & Fanshawe 2001, who have it to 2000 m). Feeds on ground, at times with starlings, doves, and chicken. Drinks at puddles, bird baths, and lawn sprinklers.

Behavior. Aggressive, casually attacks sunbirds, bulbuls, and wagtails. Birds its size or smaller seem not to feed with it.

Voice. Squeaks, shree-notes, piping and other sounds from flocks and about nests make them conspicuous (see Zimmerman *et al.* 1996).

Breeding. Breeds July–September, occasionally as early as late May. Colonies active until late September. Brown & Britton (1980) stated that it breeds almost entirely in the big rains in our region, but they lacked records from our triple-rainfall subregion in which July–August rains seem crucial. Lake Baringo birds breed May–July (Stevenson 1980). Newly constructed nests at Center in June (built in May, but few), but never more than three were completed and in use before July. Up to eight nests (10 or so birds), were at Center in July–August of most years, usually in an

Acacia xanthophloea at 4–9 m, and occasionally in an *Acacia gerrardii* at 3–6 m. At NP as many as 10 nests were active in July–September of most years prior to 1993; elephants pushing over the scattered, large *Acacia gerrardii* meant few were available, and not close to the road after 1993. We heard singing about the colonies May–September, and saw food brought to the young from 1 July onward through September in various years, but could make no detailed observations (see Collias & Collias 1964, Fry & Keith 2004).

Grosbeak-weaver *Amblyospiza albifrons*

Months. September, December; rare, presumed resident at NG.

Notes. A M and two FF observed 15 September 1988, and a pair 28 December 1989 were our only records. These were in the swamp-marsh above the water crossing at NG, and in the forest swamp farther upstream to the SW. A pair probably was resident about the swamp-marsh. They are relatively inconspicuous and their habitat was away from our study site. Movements are known (Lewis & Pomeroy 1989), and our observations may have been of weavers dispersing from areas just to the S, where mapped by those authors. For habits, etc., see Fry & Keith (2004).

Baglafaecht/Reichenow's Weaver *Ploceus baglafaecht*

Months. Local resident, wandering somewhat.

Ecology. Resident about Center, Nglesha Center-Dam area, Kuti, and probably Big Dam wall; has bred LA and near Main Gate, and at the acacia crossing (Fig. 3). Forages usually as a pair (van Someren 1956, Collias & Collias 1964) or family group. Eats insects and other arthropods, forages for them in dead leaf clusters (Dowsett-Lemaire 1990) as of *Combretum* spp., eats seeds, including from pods of *Cassia* sp., and vies for nectar with sunbirds at *Loranthus* flowers and at nectar-feeders provided by humans. We were surprised to find it regularly eating meat at hanging carcasses at Center. Sometimes joins mixed-species foraging flocks, including those of *Ploceus* spp. Drinks and bathes at bird baths. Occurs throughout the highlands (Lewis & Pomeroy 1989), see also Fry & Keith (2004).

Movements. None noted.

Behavior. Reasonably well known (Chapin 1954, van Someren 1956, Fry & Keith 2004). Very aggressive, possibly as a compensation for its solitary nesting and the need to keep other weavers away from its nests (a M and two FF constructed 24 nests in an *Acacia xanthophloea* and mainly an *A. kirkii* at our Nanyuki home within 15 mos – five were actually used for

nesting and several as M roosting nests, but the appearance of the tree was that of a colony of Baglafaecht Weavers nesting therein, thanks to the "extra" nests). Attacks and chases Speke's Weavers, especially preventing them from stealing nest material. Tends to be dominant over Red-headed Weavers, keeping them from its nesting trees. Also seen to attack and pursue Common Fiscal, and assorted finches and bulbuls about feeders.

Voice. Very vocal, including variable songs (van Someren 1956: 452 barely credited it with a "song of sorts"). Members of a pair maintain contact regularly with "pseet," "pfeet" or "shreep" (to "shreep-shreep-shreep") calls, also given when one or the other adult arrives near the nest. Approaching a feeding site where other birds are present, especially M utters a "challenge call" that serves to flush the more timid of them. This ranges from a "feew-feeew-FEEEW" or "pfeew, pfeet-FFEEET," to a "weee-eee, psee-eeee," or a screechier "skreeee-eeee-pipipipipipitititit". The song basically is a two- or three-part series: a "chee" or "wee" section (as "chee-chee-cha-wee," or "chee-chee-chee-cha-ta-wee"); a buzzy, chattering or swizzling trill, as in many weavers; and perhaps ending in several "chee" to "weeeeee" notes. Sometimes it is a brief "chee-areeeeee." Versions are: "shree-shree-cha-cher-weeeeee;" "cha-chee, cha-wee, chchchchchch, cha-eeeeee;" "dreee-dreee, chip-chip, breee-eeee-dee-eeeeee;" "chee-cher-eee-cher-eeeeeee, prrrrrpppppt;" "shweet-shweet-schweee-chew, bzzzztttit, chew;" and "weeeeee-weeeeee, ch-ch-chchch" (the sections may be reversed at times, as "pt-ch-ch, zzzzzit, cha-chew"). Songs usually are uttered from the tops of bushes or trees, and especially in or adjacent to the nesting tree, and were heard April–July and December–January of various years (around Nanyuki songs heard in all months, over years). These data considerably amplify vocal information in Fry & Keith (2004).

Breeding. Van Someren (1956) found that this weaver nests in March and again in November about Nairobi. Brown & Britton (1980) had 111 records from our region overall, with a peak in May and double-digit numbers only in February–June (75% of records, dropping to six records in July and none in August); there were three to five records per month from September–January. We had nests and fledglings only in April–July and January, with immatures to October and in February. Of 12 nesting and nest-construction records, two were in January, five in April–May, and

five in June–July; half our April–July records were after May, whereas but one-quarter of Brown & Britton's records February–July were after May. The suggestion is that few of our birds begin nesting before April, and more commence in June–July, thus breeding is mainly in the big rains of April–May and beyond them to the beginning of the July–August rains.

Nests were at 3–6 m, except for four nests at 1–2 m above water in low *Acacia gerrardii* trees at the acacia crossing (Fig. 3). Nests were in acacias (*A. gerrardii*, *A. xanthophloea*, *A. abyssinica*), except for one in a *Spathodea campanulata* over a house at Center. In one case a M Baglafaecht drove away a Red-headed Weaver M that had started a nest, and took over the nest, completing it. In other cases (at acacia crossing) Speke's Weavers' nests were usurped; the latter may have abandoned some nests, but the larger Baglafaecht took over at least two by force. Details of nests are in Fry & Keith (2004); nest usurpation is unreported. A slight projection or roof extended out over the lateral entrance, but we saw no tunnels or spout as such. In at least two years several Speke's Weaver nests were in the same acacia (*A. gerrardii*) tree in which there were two Baglafaecht nests; MM of the latter construct roosting nests. We saw nest-guarding (M perched for long periods near the nest) only at acacia crossing, where other weavers were nesting. No more than two young (fledglings) were observed. The two January nests were at Center, where liberal use of water, seed-feeding and other human activities may enable breeding all year (our garden pair at Nanyuki bred following unusual and heavy January 2001 rains, and continued nesting to June, raising three broods, followed by two more in wet September–December).

Specimen data. We netted five, including two MM that we only weighed and let go at Center 14 February 1985, an immature M at EG in February, and a pair at TA 19 May. The three MM weighed 32–36 g, the May F was 25.25 g and the young M (trace of gape wattle present) 30.5 g. These are within the range of those weighed by Schifter & Cunningham-van Someren (1998) from the Nandi Forest. One M had wings 78.5 mm, and the young M 79.5 mm. The May pair were completing the molt; the M had a cloacal protuberance. Soft-part colors: All were black-billed. The single M examined closely had black mouth lining; the lining was pink in the F with the M and pink with a black pharyngeal line in the immature M. The tongue of the M was pink; so was that of the young M, (tongue was cleft and papilla-like at tip). The eyes were creamy white in adults and gray-

white in the immature. No birds had bright yellow eyes (see Fry & Keith 2004). Legs and feet were dusky reddish pink (M) and dusky pink (F). They represent *P. b. reichenowi* (Jackson & Sclater 1938, Schifter & Cunningham-van Someren 1998, and Fry & Keith 2004).

Little Weaver *Ploceus luteolus*

Months. May, one record; undoubtedly an upslope wanderer from Lake Baringo.

Notes. At least two MM and one F of this distinctive tiny weaver accompanied much larger sparrows and Speke's and Chestnut weavers feeding in acacia and grass, and drinking from the wall of Center South Dam (1880 m) and in the surrounding mammal-degraded acacias 15 May 1996. They were in breeding plumage (Zimmerman *et al.* 1996). Lewis & Pomeroy (1989) gave 400–1500 m as its altitudinal range, and mentioned wandering (see Britton 1980). The 1500 m level is just W of the Ol'ari Nyiro Ranch boundary. It is common about Lake Baringo (Stevenson 1980), where it may breed all year when rainfall is extensive.

Spectacled Weaver *Ploceus ocularis*

Months. December, January; vagrant, Nglesha only.

Notes. Only FF seen, one in the E lugga understory trees 29 December 1993, and the other netted in trees along the stream, both at our NG site. This is just into the quarter-degree square 50 C (Lewis & Pomeroy 1989), and thus it occurs in all parts of one-degree square 50, and to the E. Conditions probably are not moist or dense enough for it away from NG; regular around Nanyuki. The netted F was 23 g in weight, with wings 72.25 mm; it had just completed its molt when netted 29 January 1992; it had a white iris and a single black feather in its throat. It represented *P. o. suabelicus* (Chapin 1954, Mackworth Praed & Grant 1960).

Vitelline Masked Weaver *Ploceus velatus*

Months. May–September; irregular visitor and breeder.

Ecology. Observed at Center in 1982 (no date) by S. Sassoon, and by us 5 August 1997, it was about the acacia crossing and Nglesha Dam (1970 m) during May–July 1989, at Northern Plain Dam (1870 m) in 1990, and about acacia crossing July 1986 and August–September 1992. A flock with breeding-plumaged adults, numbering *c.* 25, flew over Kuti 14 May 1989. One breeding-plumaged M was netted at TA

in July 1994. On 27 May 1989, six of these weavers in non-breeding plumage were practice-building (Collias & Collias 1964) nests feverishly at NG, using new grass (a colony was nesting at the S end of Nglesha Dam at this time). It supposedly occurs below 1800 m (Stevenson & Fanshawe 2001), and mainly below 1400 m (Lewis & Pomeroy 1989), but the latter authors mapped it across the Laikipia Plateau, nesting to 1970 m and seen at 2040 m about Nglesha.

Movements. Not resident, and known to move about, especially with rains (Lewis & Pomeroy 1989).

Behavior, Voice. See, (e.g.) Collias & Collias (1964), Maclean (1993), Fry & Keith (2004).

Breeding. A colony with up to 20 nests at the S end of Nglesha Dam May 1989, three to four MM and associated FF nested at the acacia crossing July 1986 and May 1989, five MM at Northern Plain Dam June–July 1990, and three MM built nests at the acacia crossing August–September 1992, and in May 1994. Usually some Speke's Weavers and sometimes Chestnut, Red-headed and/or Baglafaecht weavers were nesting among or adjacent (in other trees) to them. All nests were over water, thus not accessible to us. Weaving of the nests, MM singing about nests, and feeding of young in them were evidence of nesting activity. Brown & Britton (1980) had 94 records of breeding in our region (D); of these 74 (79%) were in March–May, 10 in January–February, seven in June–July, and none in August–September. Initiation of nests in September, lack of June records, and activity in July–August suggest that July–August rains are of importance to potentially breeding Vitelline Masked Weavers in our subregion, and that breeding tends to follow the main rains, or occurs during and after the July–August rains.

Specimen data. One adult M with a small cloacal protuberance was netted 9 July 1994 at TA. It weighed 21.5 g with wings 70 mm. It was not molting, although the outer secondaries were newer than others. Its eyes were red-orange; orbit was blackish gray with a fine line of black feathers. Its back was greenish with scattered, fine blackish lines, with a blackish "smudge" at the base of the nape. The black of the face extended from over the eyes in a line to the bill, and barely the culmen, across the forehead; this mixed with chestnut, then rufous that mixed with the crown yellow just behind the eyes. It represented the rather greenish-backed (Chapin 1954) *P. v. uluensis*. We sought other, generally lower elevation masked weavers, but only the reddish-eyed, restrictedly black-faced Vitelline was noted.

Black-headed/Village Weaver *Ploceus cucullatus*

Months. May; one record.

Notes. On the same date at Nglesha that small-billed *P. vitellinus* were “playing” at weaving (27 May 1989), eight large-billed, non-breeding, red-eyed (three) and brown-eyed, buffy Black-headed Weavers were cutting grass and weaving it about old Baglafaecht Weaver’s nests at Nglesha Center. There was much fluttering and calling as individuals to trios brought fresh grass back to these old nests and weaved loose circler around the decaying nests. This species is familiar to us from Nairobi. Although common to above 2000 m, they are generally absent from the Plateau (Lewis & Pomeroy 1989), although flocks were seen occasionally just to the S of the study area around Kinamba.

Speke’s Weaver *Ploceus spekei*

Months. All but March, November; the commonest true weaver in the area.

Ecology. Resident, except perhaps in drought years, and in small numbers November–February (seen in six years during those months). Sporadically occurs at many sites, but colonies are their centers, and these were at Center and Kuti. Occurs across the Laikipia Plateau (including quarter-degree square 50 A, where not shown by Lewis & Pomeroy 1989). Drinks and bathes frequently. Eats emerging termites on the ground and hawks for them in flight. Seen feeding on carcasses hanging in meat shed at Center; one F took mouthfuls of meat to feed to her young. Nests (young) are attacked by African Harrier-hawk.

Movements. A few may be about colonies all year, but most vacate the area after breeding. Appeared to nest January–February 1998 after heavy, all-year 1997 rains, so is able to move in when conditions warrant.

Behavior. The M sings and displays exuberantly, even where not actually nesting. We played back the voice of a singing M with another M and a F at PK 24 July. One M chased the other about, then pulled at grass, carried a stem to an olive over our car and there worked for 2 h, feverishly gathering grass stalks and constructing a circle (Collias & Collias 1964) at 3 m (the F stayed about for 1 h, then left, and the nest was never used). In display at nests in a colony, the upside-down M clasps the nest with feet apart, puts its head down and flits its wings as it sings. One M accompanied by a F gathered grass, sang with grass stalks in bill, flew to the nest, tucked in the grass then, as the F entered the nest, displayed to nearby MM. Single nests, as one at upper GMF 25 April, may be lost to Red-headed Weavers. Even colonies can be so

affected, as Chestnut Weaver took over many Speke’s Weaver nests at acacia crossing in July 1991 and in June 1994; many Speke’s Weavers left, but some nested thereafter in trees closer to the shore. Despite interspecific aggression, we noted 15 May 1994 at acacia crossing one *Acacia gerrardii* bearing three active nests of Speke’s, one nest of Vitelline Masked, one finished and one newly started nest of Red-headed, and two nests (one probably a M’s roosting nest, as may have been one or two of the Spekes’ nests) of Baglafaecht Weavers, with some space between nests of these species. Nesting was completed or the nests of the Red-headed, Vitelline Masked and Speke’s weavers abandoned, when Chestnut Weavers disrupted that colony in June. Baglafaecht and Chestnut weavers were dominant over the others. Despite nesting together in the same tree at Center for most if not all 14 years, with nests in separate masses (but very close together), there were virtually no interactions between Speke’s Weavers and Chestnut Sparrows; they differ considerably in size. See Fry & Keith (2004) for other behavior.

Voice. Calls include “peep” and “peew” notes singly or as double or triple notes. Songs include buzzy, swizzling notes, “pew” and “seee” notes, and pure whistles. Two heard were: 1) “tz-z-z-z-z, za, za, eee, eh, eh, ch-ch-ch, tzz-zzz-zzz-zzz-zzz-ip, pew-eeep, wheeeeee-wheeeeee;” and, 2) “tz-z-z-z-za-za, ze-ze-ze, eh-eh-eh-ah, tzz-zzz-zzz-zip, eep, eep, eep, peecyew, peeeeee.” These were uttered by MM at nests, sometimes while hanging upside down. A few songs were heard in January and February of 1997, 1998, and 1999, but otherwise only in April–October, with peaks in April–May, and July.

Breeding. Bred in at least five years in April, seven years in May, nine years in June, 11 years in July, four years in August, and three years in September–October; also nested in November–December 1989 and 1993, and January–February of 1998. Some nesting sites were inaccessible, as those at the S end of Nglesha Dam in trees in the water (e.g., 50 nests, August 1989) and Ol Arabel Dam W of Nglesha (e.g., 140 nests, June 1997, two still active 21 September 1997), or were at locations not visited frequently (Education Center Dam, 100 adults, May 1995; rear of Center Dam, 100 nests in eight *Acacia gerrardii* flooded in July 1991), or visited at night (e.g., Kuti, where there were one or two small colonies in most years). The colony in an old *Acacia gerrardii* at Center apparently was in existence in 1980, with both Chestnut Sparrows and Speke’s Weavers nesting together in that tree

in most years. The Nglesha Center colony sometimes was out of view, but in some years (July 1991) was in low branches of a *Eucalyptus* sp. facing the road. Doubtless small colonies existed unknown to us, as hidden (by vegetation) colony of six nests at Northern Plain Dam in June 1991. Lone, viable nests were at Kuti staff camp in some years, and one (or two) at upper GMF that raised young in most years. All but the lone nests and those at the three centers were over water. Most were in an acacia (*gerrardii*, *xanthophloea*, *abyssinica*), others in *Rhus* sp., *Eucalyptus* sp., and others. Nests were untidy, compared with the more neatly woven, smaller Vitelline Masked Weaver nests. None had a tunnel entrance, or more than a hint of one (see Collias & Collias 1964).

Nesting occurred January–February of 1998, and November–December of 1989 and 1993; otherwise nesting was in April–September, peaking in June–July, the only months in which colonies were active in most years. Only in 1997, a very wet year, was breeding continuous from April to September; in 1996 bred May–September, in four years during April–July, in two years in June–August, and in 1991 it was only in June–July. During 1989 bred June–August and in November–December, and in 1993 it was in April–July and November–December. Few breeding efforts were made in July 1998, after January–February breeding had occurred. In 1997–1998, breeding in April–September and January–February resulted in breeding in eight of 11 consecutive months. Brown & Britton (1980) found for our region D 70% of breeding records in March–May, 11% in June–July, and 18% in October–December; there were none for August, September and February, among their 100 records. In our subregion July–August (rains) breeding is often very important, and July is the peak month. We saw fledglings May–September and independent immatures February–September and December.

Specimen Data. We netted an adult M beginning its body molt 14 February 1985 at Center. It weighed 40 g, but no other measurements could be taken at the time. On 7 July 1998 we netted a molting immature with a brown eye. It weighed 28.25 g, had a yellow-tipped tongue with no “brush,” legs pink-tinged gray, and feet and toes gray with yellow toe pads.

Chestnut Weaver *Ploceus rubiginosus*

Months. January, April–December; irregular visitor, casually attempts breeding.

Ecology. Occurred annually, except for drought year 1984, with July the peak month, followed by May–

June and August–September, these five months accounting for two-thirds of its occurrences. There was a lesser peak November–December, including October and January; April records were about equal in number to those of October. Flocks were mostly small (under 100), but seen to 600 in May, over 1000 in June, 500 in July, 2000 in August, and 250–500 September–December. When small to large flocks are seen everywhere, as in September 1989 and 1995, numbers in the study area may exceed 10 000. Forages on the ground and in bushes and trees; seems to favor buds of *Acacia gerrardii*, feeds in cultivated wheat, and forages for insects including termites. Foraged for posho put out for birds, with petronias, and around the carcass of an eland. Feeds with many other birds (which may join this weaver), especially starlings, quelea flocks, serins, other weavers and estrildids, sparrows, wood-hoopoes, babblers, and tchagras, and twice with buffalo-weavers. Occasionally seen with livestock and impalas. Drinks, bathes and suns at times. One was killed in a net by a Gabar Goshawk. Its rapid flight can be a hazard. One M of a flock speared itself, flying into one of the mass of wands projecting from an electric fence (designed to keep elephants from touching the fence); the wand penetrated through its breast, out its rump and to 12 cm beyond its body.

Movements. Discussed in part above. Non-breeding, usually small flocks, are common even when breeding is occurring. The numerous records April–December, with one January and no February–March records, indicate movement out of the area for the usually dry January–March period. In dry years absent from Lake Baringo August–April (Stevenson 1980).

Behavior. Not well known (Fry & Keith 2004). Displays with wing-waving seen when breeding; also incoming weavers joining a group in a tree wave their wings as they land. Copulations, elements of courtship glimpsed, but not observed systematically. Dominant over Speke’s and Red-headed weavers, and in groups to Baglafaft Weavers. Nest-weaving movements made by pre-breeding or immature MM (May). A F was courted by a M Straw-tailed Whydah. Took over nests of Speke’s Weavers at acacia crossing in June 1994, reconstructing them, an unusual occurrence (N. Collias, *in litt.*, see Din 1994). After c. 10 days the Chestnut Weavers largely abandoned these nests (after forcing Speke’s Weavers to nest in trees closer to dry land), although a few remained to raise young.

Voice. Swizzling songs (Maclean 1993) were heard in April–July 1994, in May 1990 and 1992, June 1991, and July 1989. “Pyewp” and “chik-chik” calls as well as chatters and partial songs, heard from flocks, including non-breeding birds.

Breeding. Some breeding occurred in June–July 1994, and probably in June 1991 (away from road), both in the acacia crossing area. Judging from the six years in which many breeding-plumaged birds were present, there is a likelihood of breeding away from our sites and from roads, e.g., downstream from PK, across the ranch border at TA, in luggas at the W border, and about the N border (a nesting colony of perhaps 300 was active N of our area, in Luoniek, 13 July 1994). June and July were peak months for its occurrence, May–July were the peak of breeding-plumaged MM, and breeding-plumaged individuals were observed during half or more years of occurrence in April–July and December (also in three years during August–September, but only twice in six years for October–November). We had no indication of breeding in December, and when breeding occurs it must take place mainly or entirely in May–July or August, from late in the big rains into the July–August rains. Chestnut Weavers breed about Lake Baringo in May–July (Stevenson 1980). Brown & Britton (1980) had 1324 breeding records from their area D, nominally including our study area, with 90% in May alone and 7% in June–July. In our subregion breeding is skewed into the July–August rains. Immatures were observed through September, including young MM with reddish eyes.

Specimen data. We netted 11 adult MM and 12 adult FF. The MM weighed 30–37.5 g (34.0 g), but seven breeding-plumaged MM were at 33–37.5 g (35.3 g), whereas four in non-breeding plumage were only 30–32.5 g. The eight measurable MM had wings 77–84 mm (80.94 mm). The 12 FF weighed 23.5–30 g (27.2 g), and seven had wings 74.5–77 mm (76.1 mm); MM thus appear to be heavier, with greater measurements than FF. Soft-part colors: The bill is black in MM, black and horn-black in FF, which may have a yellow base of the mandible. The narrow orbital ring is gray or blackish gray. The eyes of MM were brownish red-orange to chestnut-orange, and orange-crimson (two had red in outer and inner rings, with orange between them). Eyes of FF were chestnut, red-brown, brown, orange-brown and brown-orange, and, in one, red with a cinnamon tinge. They represented the widespread nominate race *P. r. rubiginosus*.

Red-headed Weaver *Malimbus rubriceps*

Months. Common resident about all sites, but often inconspicuous.

Ecology. Occurs across the Laikipia Plateau to Nanyuki (pers. obs.; Lewis & Pomeroy 1989), generally solitary or in family groups. Present in forest and thicket edges, edges of riverine woods, wooded grassland, and about habitation. Sometimes forages on ground, but usually in trees and bushes; agile, hangs upside down, forages like a tit, probing at petiole bases and into leaves. Breaks dead-leaf clusters, seeking insects. Hawks insects occasionally, actively chases moths, beats off their wings before eating them. Probes and gleans at bark at times. Eats nectar from flowers of *Carissa edulis*. Bangs caterpillars before eating them, and used branchlets of a leleshwa to break up grasshoppers (is one of few birds to forage regularly in leleshwas). Feeds on hanging, drying meat in meat shed at times. Frequently joins mixed-species foraging flocks, associating with helmetshrikes especially, and also often with flycatchers, orioles, various finches including cordon-bleus and Speke’s Weavers, white-eyes, bush-shrikes, babblers, starlings, warblers, honeyguides and others. Mobs small birds of prey, especially Pearl-spotted Owlets, with various birds just listed for flocking. Drinks regularly, bathes occasionally and seen sunning for up to 30 min.

Movements. Resident, but we saw six female- and sub-adult-plumaged birds fly SE-NW over GMF 26 July 1991.

Behavior. Aggressive, M-M and F-F; FF fight fiercely at times, and one in net was vigorously attacked by second F. Interspecifically dominant one-on-one over weavers other than Baglafaecht; a F chased away a half breeding-plumaged M Chestnut Weaver. MM may chase one another, sing at one another only 20 cm apart, and tear off nearby leaves as they face off. They flip their wings, bow face-to-face, and flutter and fly in display at one another. Clusters of weaver nests in small numbers, as by one M Baglafaecht, attract MM that may try to sing near them. One M, seen feeding a juvenile Diederik Cuckoo following it, was later observed chasing a F of that cuckoo all about, and off to the W 200 m and more. Displaying MM at nests can hang by one foot, sing and beat both wings from this position. Aspects of its breeding behavior were discussed by van Someren (1956); see also Liversidge (1991), Maclean (1993), and Fry & Keith (2004).

Voice. Has various calls, including “chip” notes, “peetz” calls, a “chip” on arrival at a nest by an adult bearing food, and various non-song notes by MM building

a nest, as “pheap-pheap.” The song contains a fine, high-pitched weaver “swizzle” series, but other notes in it vary (see Maclean 1993); it sometimes mimics, as the song of Violet-backed Starling. Two examples are: 1) “zizzip, chip, preeep, zip, chep, twit, ta, ta, chip-chip-chip, sweetzzzzzzeeeee, tee-tip;” and 2) “zeee-twee, wi, tzi, twee-zeee, tip tweee-zz-eeeeeeeee, eh, twizzip-cep” (the “swizzle,” high-pitched, is the “-zzzzzzeeeee” portion). Songs are uttered to F, sometimes as M is building, or when F comes with nest-lining material. The song is not loud, and at any distance the “swizzle” may be all that is heard. Songs peak in May–June (April–August, 88 % of songs counted, and 95 % of long, sustained bouts of singing), with a small secondary peak December–January (8 % of songs).

Breeding. Nests mainly in pairs; one M defending five new and two old nests (and the remains of older ones on the ground) sang to two FF, one of which consistently entered one nest. The other F less consistently entered another nest (FF usually are very aggressive, hence virtually all MM in our study area had only one mate). We frequently saw five or six nests and three being maintained. One nest is used as a roosting nest by the M (or by the pair when young are well grown in the true nest). Extra nests may confuse predators, or may, as we suspect in Baglafaecht Weaver, serve to assert dominance by the territorial M against any incoming M. We have seen usurpation of nests of Speke’s and Vitelline Masked weavers by a M Red-headed Weaver at the acacia crossing. The Red-headed then refits the nest(s) and adds the characteristic tunnel (see van Someren 1956, and especially Collias & Collias 1964 for structure of nests). Liversidge (1991) mentioned 40 nests of the southern form in one area, and noted that a M may have several F consorts. The long-lasting, small clusters of nests in branch tips are a characteristic feature of areas it inhabits. The M adds leaves, usually from the nest tree, to the nests being used (these could show territorial occupation by a M). Over time, whole branches may be denuded of leaves. Even when feeding young the M may bring green bits (e.g., of acacia leaves) into the nest bearing the young; one M broke petioles and leaf parts from croton leaves and took the stems to the nest. Nests at camp showed that M usually roosts in the tunnel (the lowest hanging, concealed site in the nest) of one of the secondary nests, and is joined there by the F after young are well developed. Even tip-of-branch nests may not be secure – unidentified mice (or small rats) tore the top off a nest and killed

or evicted the three nestlings 26 September 1986 at our old camp. The M weaver continued to roost in a nest-tunnel of a nearby nest, while the rodents restructured the nest (with paper, string, other debris) for their use. One nest of the weaver constructed of twigs, fibers, grasses, tendrils and leaves weighed 126 g. Nests were at 1.8–12.2 m (5.01 m), for 18 nests in acacias (*Acacia gerrardii*, *A. xanthophloea*, *A. abyssinica*, *A. brevispica*) and crotons *Croton macrostachys*. Egg shells under nests showed the eggs to be pale blue with few to a moderate number of lavender to violet spots. Nests contained two to three eggs, and no more than two to three nestlings, when we could glimpse the contents. Over the years some nest building or refurbishing was observed in every month; in February, e.g., we noted one case of a M tearing apart an old nest and two cases of nest construction. Of 69 nestings, 56 (81%) were in April–August; three were in September, and one to two in each month of October–March accounted for 10 (14%). Fledged young were seen May–September, immatures to October, and subadults (changing to adults) in April and August to November. Some breeding December–January, suggested by a small peak of singing, likely occurs sporadically and may have resulted in April subadults. These records and peak singing indicate April–September as the major breeding period, with no significant breeding otherwise. Brown & Britton (1980) had only seven records from the entire region, four of them in March–April, and one each in May, June, and November. Fry & Keith (2004) had no July–August breeding in our region, with its significant July–August rains.

Specimen data. We netted 46; five were juveniles, 16 adult MM in breeding plumage, six non-breeding MM, 18 FF, and one subadult F. The juveniles weighed 21.5–25.5 g (22.9 g) and dated May and August. Adult, breeding-plumaged MM, dating February–November, weighed 21.5–27 g (24.6 g), and 12 had wings 81–87.5 mm (84.0 mm). The six non-breeding MM, dating April, June and October, weighed 23–25 g (24.1 g) and four had wings 78–82 mm (79.8 mm). The 18 FF weighed 19–27 g (22.7 g), with wings (of 13) 77–86 mm (80.3 mm). The subadult F weighed 25 g. Several birds retrapped, most within five months, but one 14 months after the initial capture; likely this weaver is able to remove plastic bands from its legs. Molt started June–September and ended July–October, but five February–April adults were completing the molt (to breeding plumage). Non-molting adults dated February, April–

July (all six from May were not molting), and September–December. They represent *M. r. leuconotus* (see Chapin 1954). The immatures (juveniles) have a distinctive buffy yellow, sometimes greenish-tinged head; three were fledglings netted together 12 May 1993. Soft-part colors: Juveniles had deep brown eyes and a horn-colored bill with hints of orange (as at the tomia), and dusky culmen. The bill of FF is orange-yellow to orange-red, sometimes with dusky culmen; that of MM is orange-red to red, sometimes blackish about the base, with orange tomia, or with yellow at base of the mandible, at gape corners and inside nostrils. The mouth lining is pink to red-orange. The eyes are a bright chestnut; there is a narrow yellow orbital ring of bare skin. The legs and feet are pale gray-brown with a rosy tint, especially on the toes. Specimen data amplify considerably those of Fry & Keith (2004).

Cardinal Quelea *Quelea cardinalis*

Months. Three June records; casual visitor.

Ecology. A M-F group of *c.* 20 were at the edge at SI 9 June 1990, the red-headed MM with black bills, the FF gray-billed. Two of eight were full MM at the tank atop GMF hill 23 June 1990. A fully plumaged M was near Big Dam 3 June 1992. Also, seven were seen N of the study area on Luoniek 13 July 1994. The species occurs across the Plateau to the Nanyuki area (Olson *et al.*, undated MS, Lewis & Pomeroy 1989). The years 1990 and 1992 were dry with big rains of April–May well below normal. Breeds in wetter years at Lake Baringo May–August (Stevenson 1980), and in our general region mainly April–June (Brown & Britton 1980).

Red-billed Quelea *Quelea quelea*

Months. January, April–September, November–December; records in 12 of 14 years, may be common at times.

Ecology. Not seen in very dry 1990 and 1995, but records otherwise in all months of January (one year), April (two years), May (three years), June (five years), July (five years), August (three years), September (five years), November (one year), and December (three years); present three or more months in 1989, 1991, 1992, 1994, 1996, and 1998, especially during May–July. Hundreds seen in January 1996, April 1998, May 1996; thousands seen in July 1998, August 1989, and September 1989, as well as flocks in the hundreds in those months. “Clouds” of this quelea were about cornfields in August–September 1989 at Nglesha farm. It often associated with Chestnut Weavers, and also seen with other weavers, and other ground-foraging

birds (once with White-headed Buffalo-weaver). Observed at 1750–2040 m; Lewis & Pomeroy (1989) had it mainly below 1500 m, but also in highlands (to 3000 m, Stevenson & Fanshawe 2001), and they mapped it across the Laikipia Plateau. It is not resident.

Behavior, Voice. Well known (e.g., Maclean 1993, Fry & Keith 2004, many others).

Breeding. Resident, presumably breeding, at Lake Baringo (Stevenson 1980), and Brown & Britton (1980) gave April–May as its main breeding period in our region overall. MM were in breeding plumage during May–September and December of some years (especially 1989), but there are no breeding records for the study area. Of 11 netted at MK 24 December 1991, two were breeding-plumaged MM, two were non-breeding MM and seven were (reddish-billed) FF. *Specimen data.* We netted a F in July, a F in August, a M in breeding plumage in September, a F 26 December 1989, and the 12 (see above) in December 1991, but not all could be treated when netted. The July and August FF were starting to molt, the September bird and two others (F, non-breeding M) from September were in mid-molt, and the 12 from December included four ending the molt and eight not molting. We noted no arrested molt (see Thompson 1988). Five MM weighed 18.5–19.5 g (19.1 g); one had wings at 65.5 mm. The eight FF we weighed were at 15.25–19.5 g (18.2 g), and two had wings of 63 mm. These represented the black-faced *Q. q. aethiopica*; black of lores sometimes reaches bill base at sides of the basal culmen, but not forehead directly above the culmen base. Soft-part colors: The bill of MM was orange-red to crimson with a yellow-horn tip; F bill color was more variable, from orange-yellow through pink-orange and orange to red with yellow tomia and tip. The orbital ring was orange to red in both sexes, but averaged less red, to yellow-orange in FF. The eyes were dark brown. Most birds had pink legs and feet, with MM tending to be more reddish pink.

Yellow/Yellow-rumped Bishop/Widowbird *Euplectes capensis*

Months. February, April–October, December; probably resident in low numbers, more numerous in some years.

Ecology. Inconspicuous when not breeding, and in bushy, grassy habitats where easily overlooked, hence possibly resident. Recorded in most years only in June–July, in six years during May and August, and in four years April and September. It favors lush grass with bushes and scattered trees; in wet years occupies

Combretum grassland and bushy slopes, otherwise damp grass, reeds and herbs around and below dams and near springs and habitation. Frequents burned areas, feeds on airstrips (in low grass), and in grain fields. Occurs at all elevations, and is known across the Laikipia Plateau to Nanyuki (Lewis & Pomeroy 1989). Eats posho meal and seeds of grain put out for birds, and in cultivation.

Movements. Groups seen overflying high, and flocks noted of up to eight individuals, in April, June and September. Moves at least locally, and absent entirely in drought of late 1984–1985.

Behavior. Well known (van Someren 1956, Liversidge 1991, Fry & Keith 2004). Aerial displays with buzzy flight and erected, beacon-like yellow patch on back are distinctive.

Voice. Well known (see references above). One M called “cheep” as it was released, very like some cheep-like “chips” of the slow “chip” series sometimes given. Otherwise “chip” series of sharp “chip,” “cheep,” or softer “bzeep” notes uttered from a perch, and may lead into a song, as “chip-chip-chip, pa-tzee, ta-zeet-ta-weet, pa-zee-zee-zee,” in a rapid series of notes. In aerial display can combine “chip” and “tzeet” notes into its fast, buzzy, swizzling song (“chip, psee-eee-eee, tzee-zeeeee-tzeee-eeeep, zzzzp, zzzzp”); the song is punctuated by “flip-flip-flip,” very audible wing sounds, as it flies, bee-like. It also flips its wings at times as the M flies to a perch in or near its breeding territory.

Breeding. No nests were found, but the peak of displays, songs and occurrence of MM in breeding plumage in June–July (all songs were in May–September), FF gathering nesting material in July, a copulation in September, and fledglings August–October indicate breeding May–September, mainly after the big rains and into the July–August rains. Brown & Britton (1980) had 48 records from our region overall; except for single records in five scattered months, 43 or 90% were March–June, hence it is clear that they had no records from our triple-rains subregion. After three consecutive wet years bred in 1998 between February–July; in eight other years the season was May or June to August or September, except for 1987 (July–September) and 1992 (June–October). These data highlight the importance of regular, dependable July–August rains for its breeding.

Specimen data. Only two MM were netted, one at TA in April, the other at PK in June. The April M was in breeding plumage except for a few brown head feathers, brown in the wings, and white bars scattered

on its belly. The June M was fully in breeding plumage; it showed three or four white streaks on its belly. They weighed 25 and 21.75 g, and had wings of 75 and 74.5 mm (April bird first in each case). We also observed a M in breeding plumage with a small white “bow” across its breast. Both MM netted had the deep bill characteristic of *E. c. crassirostris* (Chapin 1954). Soft-part colors: As noted by Chapin (1954), the bill was “mottled” in both MM, with black along the distal culmen, about the nostrils at the maxillary base, and shadowy gray-blue along the sides of the mandible; otherwise it was grayish horn (bill often looks pale overall in the field).

Red-collared Widowbird *Euplectes ardens*

Months. June–September; single MM, three times, all at Ngesha Center area.

Notes. A M in full breeding plumage was atop an *Acacia abyssinica* in a field at Ngesha 23 June 1992 (observed 5 min). One M was in paddocks at Ngesha all of August–September 1994, where seen by B. Heath on his various visits there; and one perched in a cornfield at Ngesha 7 July 1995. Harvesting and overgrazing probably prevent regular residence. A visitor from the S, known across the S, high Laikipia Plateau (Lewis & Pomeroy 1989). The MM had the maximal red of the head of *E. a. suahelica*. Reasonably well known (van Someren 1956, Maclean 1993, Fry & Keith 2004).

Long-tailed Widowbird *Euplectes progne*

Months. July; two records, casual visitor from S.

Notes. A M seen at Center Dam 8 July 1994 was in full breeding plumage. B. Heath, ranch manager, reported a M during July 1994 at Ngesha. We observed eight, three together, on Luoniek Ranch, just N of the study area 13 July 1994. That year, 1994, was a particularly wet year, following very dry 1993. It was given as occurring in Laikipia by Zimmerman *et al.* (1996) and mapped by Lewis & Pomeroy (1989) as ranging across the Laikipia Plateau. Its marshy grassland habitat is almost non-existent in the study area. This widowbird (considered threatened regionally by Bennun & Njoroge 1999) is subject to wandering (Britton 1980). For more information see Maclean (1993) and Fry & Keith (2004).

Jackson’s Widowbird *Euplectes jacksoni*

Months. May–September visitor in six years; possibly breeds sporadically.

Notes. A grassland widowbird that should breed, except that grasslands in the study area usually are overgrazed and more suited to whydahs than to widow-

birds. Observed in June–July 1989, May 1991, August–September 1994, July and September 1995, June 1996, and July 1998. Of these years, four of six were wet ones, and wet 1994 came after very dry 1993. Some overfly the area, as six MM in breeding dress passing NW over MB 31 May 1991, and 15 MM and FF flying N over Big Dam 22 September 1995. Others were resting near dams and water tanks. Displaying MM were at Nglesha in July 1995 and August–September 1994, and one M displayed over the S boundary fence 20 July 1998 (this widowbird is seen occasionally in cultivation about Kinamba, just S of the study area). Displays were in dense pasture grass, hayfields, and cornfields. This species does wander; it occurs across the Laikipia Plateau along its S, higher section (Lewis & Pomeroy 1989, Zimmerman *et al.* 1996). We note that Red-naped, Long-tailed and Jackson's widowbirds have been observed only June–September in breeding plumage, except for one Jackson's on 31 May. The Brown & Britton (1980) breeding records for these three species in our region D are in April–May or June, and almost certainly include no Laikipia Plateau records; the Plateau birds most likely breed during the July–August rains, not the earlier big rains. Olson *et al.* (undated MS) reported all three of these widowbirds, apparently casually, at Mutara, to our E. For more on its behavior, breeding and ecology see van Someren (1956), Maclean (1993), and Fry & Keith (2004).

PASSERIDAE Sparrows, petronias

Rufous/Great Sparrow *Passer motitensis*

Months. Local resident, especially about habitation.

Ecology. Occurs regularly only about the centers at Kuti, Center and Nglesha; to a lesser extent at Whydah Area, about Main Gate and NP, and only sporadically at a few other locations (Big Dam, OD, the stream-crossing at Nglesha). Can be found about kitchens, in pastures with domestic mammals and at bird-feeders and baths. One drank by hovering in front of a dripping faucet, and hawks insect (termites) in the air. Concentrates about food, such as spilled grain, in numbers to 30–40 at Kuti. Feeds loosely with petronias, serins, and waxbills. Probably moves out to feed occasionally, as from Center to the Whydah Area, where up to 10 may feed at times.

Movements. Local only.

Behavior. Well known (Clement *et al.* 1993, Fry & Keith 2004). Seen chasing Red-fronted Tinkerbird, and feeding group at Center once broken up by an attack of a Mosque Swallow.

Voice. See references cited under Behavior. Chirps much like other species of *Passer* known to us. Has a harsh “chip-chip-chip” series on occasion. Chirp song often slow, “Chirp- -chirt- -chirrup-,” notes to one per 2 s.

Breeding. We have seen nests being constructed in February, and otherwise May–July and October nests, as well as fledglings attended by parents April–July. Nesting here is later than April–May peak reported for the overall region by Brown & Britton (1980). Nests are bulky twig and stick structures placed 1–3 m, usually in acacias (*Acacia xanthophloea*, *A. kirkii*, *A. gerrardii*). Often numbers of feathers seen projecting from opening at side of the nest. Young fledged numbered two and three. Even nests about buildings were placed in small acacias or, in one case at Main Gate, in a *Euphorbia candelabrum*. Collias & Collias (1964) and Fry & Keith (2004) described nest in detail; see also Tarboton (2001).

Specimen data. We netted none, but saw individuals about Kuti in mid-molt in August, and photographed plumage features of *Passer motitensis rufocinctus* (Dowsett & Dowsett-Lemaire 1993, Clement *et al.* 1993). The superciliary stripe in MM is rufous to the rear, and shifts to white over the eye; from the front only the white front is visible. In FF the superciliary is rusty white, usually more white than rufous. The lores are black in both sexes, and the black occurs behind the eye, sometimes as well as a fine black line below the rusty superciliary, hence presence or absence of a black line under the superciliary in other related forms (Clement *et al.* 1993) is of doubtful taxonomic significance. Eye color is creamy white to white with a hint of bluish. The white under the eye (ignored in field guides) and along the black throat patch margin affords sharp contrasts frontward in MM, along with white of the superciliary stripe. These white areas are conspicuous in displaying MM, and form an intricate pattern with the black, rufous and gray of the head. Tips of the median wing coverts are broader than those of other coverts, forming a conspicuous white bar (as in Clement *et al.* 1993, Plate 69). MM can be quite gray below and may show blackish in the gray of the ear coverts and face below them. Treated as *P. rufocinctus* by Fry & Keith (2004).

Chestnut Sparrow *Passer eminbey*

Months. Seen in all but March, October–November; visiting to breed in most years.

Ecology. Few records in a few years in September, December–February and April; most records are in May–August. Absent or seen once or twice in dry years

(1984, 1985, 1987, 1990, 1993, 1995); present at Center colony during the 1960s and 1970s (pers. obs., Horne). Present primarily about Center and Kuti; occasional at Whydah Area and acacia crossing, and casual at NP, CS, Ol'ari Nyiro Springs, and not seen about Nglesha and the S border. Drinks, feeds on ground with other sparrows, weavers and others; feeds about houses and at Center feeders. Flocks usually small, *c.* 10–20, occasionally to 50, and 200 fed about Kuti 6 February 1996 (50–150 at breeding colony at Center when it is active).

Behavior. Displaying MM “fluff” their plumage. Bowing courtship seen near nest in August, followed by copulation.

Voice. Difficult to hear about the Center colony with many Speke's Weavers and Chestnut Sparrows together. Even small flocks make a “whooshing” sound when taking off.

Breeding. Colony at Center active only May–September, except also in December 1989; outside these months full-breeding plumaged MM were noted only 8 January 1996 (two MM, Kuti). The mixed colony of Speke's Weavers and Chestnut Sparrows, has latter nesting to one side of, and below the weavers. Up to 75 sparrow nests were active in good years (e.g., 1992, 1997), these being in part constructed entirely by the sparrow and in part in reconditioned old Speke's Weavers' nests, in which portions of the bottom and sides were replaced by the sparrows. Fully constructed nests were in use as early as 10 May 1995, and young were fed in nests as late as 23 August 1997. The December 1989 nesting occurred in absence of weavers, and 10 or so pairs used old weaver or weaver/sparrow nests that the sparrows repaired. In some years the colony was active only May–June (1996), June–July (1991), or July–August (1989), and in others it was active for four months (May–August, June–September). Immatures, females and males in mixed plumage are in evidence late in the breeding period, particularly in August, but leave shortly after that. At Lake Baringo, where numbers vary from year to year, breeds in May–June (Stevenson 1980). In Brown & Britton's (1980) Region D, most records are for June (112 of 130), with 17 others April–May and July; in our part of Region D breeding seems influenced by the July–August rains, with nesting from the end of the big rains through the July–August rains. Brown & Britton note that their records are late in the big rains because of the Chestnut Sparrow's having to wait to utilize weaver nests after those are abandoned. In

the colony at Center this is not a problem because there are so many old nests available to the Chestnut Sparrows.

Northern Gray-headed Sparrow *Passer griseus*

Months. March, May–October, December; probably resident pair or so at Center and Nglesha.

Ecology. Seen once each at Posho Corner, PK, GMF, and Kuti, otherwise records all at Center and Nglesha Center, where it has occurred at least since the 1960s. Is definitely less numerous than Rufous Sparrow, either due to fewer nesting opportunities (nests in holes, especially in buildings, Chapin 1954), or a preference for more moist conditions (Brown & Britton 1980); Lewis & Pomeroy (1989) mapped it throughout the Laikipia Plateau. We have seen no more than five together, once at Nglesha, and up to four at Center. Forages on ground in cultivated fields and about pastures and buildings, only occasionally with finches and weavers. Hops as well as walks (see Maclean 1993, under *P. diffusus*).

Movements. Moves locally in dispersal, and wanders somewhat.

Behavior, Voice. Aggressive, one of few smaller finches able to withstand attacks of M Pin-tailed Whydah at feeders. Song a series of harsh “churp” notes, slurred and varied, as “churp, chirp, cheerp, chup, churp” (see Clement *et al.* 1993).

Breeding. Apparently nests inconspicuously, as we have general observations of young (fledglings) being fed and of nests in holes in houses and outbuildings but have few data. Brown & Britton (1980) had nests in our region (likely not in our general area) in nine months, especially May–June (11 of 26), but also March–July (17, including the 11 from May–June), and November–June (8 records). As they remarked, its association with humans may allow breeding at diverse times. We found one nest 14 August 1997, in the center of a 4-m pipe 3 m up, where a cross-pipe joined it. It was open at two ends, with a long “walk” in to the nest from either end. Two young were fledged from this nest. Otherwise, we saw a battle at a tree-hole nest of Nubian Woodpeckers, with gray-headed sparrows attempting to get past the woodpeckers into the cavity. The M woodpecker withstood numerous attacks and attempts to enter the hole. These sparse records suggest breeding in July–August rains, but likely they nest sporadically at other times as well.

Specimen data. Relationships within the gray-headed sparrow group are as uncertain as they were when

we discussed them earlier (Short *et al.* 1990; see also Dowsett & Dowsett-Lemaire 1993). At Karen, Nairobi, and in the study area we have seen very large-billed to average-billed, brown-gray to brown-backed, and white-throated to gray-throated sparrows, and intermediates. These are putatively of the race *P. g. gongonensis* that some consider a full species (Fry & Keith 2004). The only bird we handled was the only one seen and netted at GME, 14 May 1994. This was an adult, possibly newly adult (fluffy head with new gray and some old brownish feathers; in fresh, adult plumage otherwise, but with the central rectrices not to full length) that was feeding in grass by our banda. Its upper back was gray-brown, wings and rump were bright rufous-chestnut, inner median coverts were tipped white, its head was gray, sootier in the ear coverts and gray-black in the lores. Its throat was pale gray, underparts otherwise were dull gray, and bill of average, even small size. It weighed 29 g, and the wings, possibly not at full length, were 81.5 mm. Allowing *P. g. gongonensis* considerable variability in its central Kenyan range, we assigned it to this race, despite its small bill and pale throat. Soft-part colors: Relatively shallow bill black with horn-black along the tomia; mouth lining dusky gray-black with a pink tongue. Orbital skin gray-black, but has a dotting of fine white feathers around and close to the eye (these feathers seemed fresh, and may disappear with wear); eye chestnut-brown. Legs and feet grayish brown flesh-colored.

Yellow-spotted Petronia *Petronia pyrgita*

Months. Common resident, found at all wooded sites. *Ecology.* Perhaps less common over 2000 m, but nonetheless seen occasionally 1910–2060 m at NG, Main Gate (once a family group), PO, and LU, and common at other sites 1740–1980 m. Lewis & Pomeroy (1989) gave as its elevation up to 1500 m, and to 1800 m at times, though they mapped its occurrence entirely across the Laikipia Plateau; Fry & Keith (2004) gave 1500 m as its upper limit. Probably adversely affected by drought and very dry conditions, as commoner some (wetter) years than others. A secondary-cavity nesting species, it requires trees for cavities in which it nests. Forages diversely singly, in pairs, family groups or numbers up to 20 on ground and in bushes and trees. A pair worked over, around, under and through our parked vehicle on three occasions at two different sites. Eats grass seed, comes to maize meal and oatmeal put out for it, and takes kitchen scraps. Seen taking scale-insects off olive trees, captures inchworms, katydids, grasshoppers and other

large insects, especially to feed to the young. Eats buds of some bushes, comes to drying beeswax and wax at hives put out for honeyguides, seeks waxworm larvae in wax, but also eats wax bits and even feeds them to its young. A gathering of 20 ate olive fruits. Takes meat from carcasses in Center meat shed. Flycatches adeptly for termites, and possibly other insects. At times feeds with other finches including serins, cordon-bleus, Rufous Sparrows, and also with bulbuls. Drinks, may fly long distance to water at a dam; bathes often. Also dust bathes, and suns with wing or wings outstretched and fluffed head, nape and body toward the sun. Participates in mobbing owlets and snakes. At a nest a F performed a distraction display (wing out, flopping over itself on ground, staggering, feigning injury) in front of a spotted bush snake *Philothamnus semivariiegatus* climbing up toward the petronia's nest in a tree. The petronia's mate then attacked the snake, with assistance from a M Variable Sunbird, and the snake fled (the nest was successful). The distraction display and snake attacks by petronias are known for *Petronia petronia*, and *P. brachydactyla* (Cramp & Perrins 1994a). At LU dam, in a dead tree in the water a Gabar Goshawk perched, appearing very like a large cuckoo; a petronia flew toward that tree to perch, and as it landed the goshawk burst upward at the petronia, which dove down and to one side. The Gabar Goshawk missed by a few cm, and the petronia escaped to shoreline trees. If the petronia perceived the hunched goshawk as a "non-predator cuckoo," the suggestion is that hawk-cuckoo resemblances might involve mutual mimicry, the hawks gaining a predatory advantage and the cuckoos perhaps an advantage in lessening mobbing by their hosts.

Behavior. This petronia is aggressive, especially but not exclusively in attempting both to usurp nesting cavities, and to defend its own nest against a takeover. We observed: a pair of petronias trying to drive Brown Parrots from their acacia nesting cavity; a pair of petronias attempting to evict a F Gray Woodpecker from the woodpeckers' newly excavated nest; and a single petronia chasing both the M and F of a pair of Violet-backed Starlings that were carrying elephant dung to their *Acacia xanthophloea* cavity. Petronias also were seen to fight off Blue-eared Glossy Starlings attempting to usurp the petronias' nest. Yellow-spotted Petronias were also observed in six or seven encounters with Lesser Honeyguides, the latter usually attacking the petronias, which at times returned the attacks; the petronia may be a host of honeyguides, as is its close relative the Yellow-throated Petronia *P. superciliaris*

(Short & Horne, in Fry *et al.* 1988). In attacks Yellow-spotted Petronias thrust the head forward, gape widely, may cock the tail and spread apart the undertail coverts, then fly at and chase an opponent. In pair interactions, the M may follow F, particularly when she flicks her tail. The F quivers its wings and crouches in soliciting; the attendant M also quivers its wings. Its behavior is apt to be generally like that of *P. petronia* (Cramp & Perrins 1994a) and *P. superciliaris* (Maclean 1993, Harrison *et al.* 1997).

Voice. More variable than usually reported. Its call is a single “tink” or, more often, a double-note that varies (“p’tink,” “pe-trink,” “pew-trink,” “trink-trink,” “tche-tchink,” or a simpler “tink-tink” or even “pit-it”). Also calls “sherp” to “chirp” and, in apparent alarm, a fast “tink, tink, tink, tink” series. Fry & Keith (2004) give no hint of the characteristic “-ink” quality of its calls. Begging young call “ti-ti-ti” to “chit-chit.” One came to playback of the song of the Pallid Honeyguide, a potential but unreported nest-parasite of the petronia. Occasionally the song is a simple, repetitive series of “chirp” notes. More usually there are repeated phrases, as “chrra-chirra,” “chirr-up,” “chink-chirp-chirp” or “chink-chirp-chip.” “Tink” notes may end a song, as “chirr-up, chirr-up, tink-tink,” and “teek, teek, teenkenk.” Songs may include up to a dozen or more notes, as: “chirp-chirp-chup, chirp-chup, chirp-chirp-chirp-chirp-cheep, chirp-chup-cheep.” It is very vocal, not the usually silent petronia reported by Clement *et al.* (1993) and Borrow & Demey (2001), and more like *P. petronia*, described as more vocal than species of *Passer* by Cramp & Perrins (1994a). In conflicts gives bill snaps in short series, audible up to 8–10 m away. At GMF over nine years sang on 20% or fewer days December–March and September, with slightly more song October–November. Songs peaked May–June (songs 65–75% of all days); 70% of all songs were in May–August, and 85% of all songs, on 62% of all days, occurred April–August.

Breeding. Although occasionally seen as a pair at a hole November–February, the only nesting indication in that period was of nest material carried into a building in November 1994 (also, the attempt on a parrot nest noted above was in November), and as suggested by data from song, few petronias nested then. Courtship and soliciting were seen in March, and nests, and attempts at usurping nests in April–July, peaking in June; fledglings were observed June–July and immatures, July–September. Thus breeds mainly or entirely April–August. Brown & Britton’s (1980) few records from our general region were all in March–May and

in December. Our subregion involves breeding during the big rains and through to the important (more regular) July–August rains. A pair nested in the same cavity in a GMF building for three consecutive years (uncertainly the same birds in all years), that raised two broods in April–May and May- or June–July of all three years, producing three, then two fledglings in each year. Nests were as low as 1 or 1.5 m (in the wall of a building, in a post hole, and in an old woodpecker cavity in a poison-arrow tree *Acokanthera schimperi*), and as high as 7 m in the stub of an *Acacia abyssinica*. Other nests were in: *Olea europaea*, *Acacia xanthophloea*, *A. gerrardii*, and *Combretum molle* trees. The nest in our building was of dried grass, bits of string, a dried snakeskin (species unknown; not noted in other petronias by Cramp & Perrins 1994a), and many guineafowl feathers. Much fine plant down was within the core “pad” of the irregularly shaped nest, which was c. 26 cm long. The usual number of eggs seemed to be three (we saw no more than three fledglings at any time). Nest sanitation is carried out regularly. Both parents feed insects to the young, in cool mornings at a rate of c. 20 times per h. Parents together at the nest both called “shri-shri” or “prip-prit,” additional vocalizations to those above.

Specimen data. We netted 56 Yellow-spotted Petronias, 46 adults, of which seven could confidently be treated as MM, plus four FF, seven recently fledged juveniles, an independent immature, and two subadults changing into adult plumage. Non-molting petronias were in November–July; those starting molt of flight feathers May–September; birds in mid-molt June–September, and those completing the molt September–February, except one in May. The seven MM and four FF differed slightly but insignificantly (means respectively 25.3 and 24.8 g), and the 35 other adults weighed 24.86 g (with MM and FF added the 46 weighed 24.92 g, overall range 21.5–30.5 g). Four MM had wings 90–91 mm, and two FF, 85 and 87.5 mm: altogether 27 adults had wings 78.2–91 mm (86.4 mm). The seven juveniles weighed 21.5–25.5 g (24.3 g), the older immature was 27.5 g and the two subadults 25.4 and 28.5 g. Wing measurements are less than those given by Clement *et al.* (1993) for *P. pyrgita*, but the birds represent that subspecies. Although we have seen brownish gray adults, most are grayer with little brown. The superciliary stripe is often well-defined and white. The breast spot of yellow varies in extent and somewhat in brightness; not all variation is sexual, although MM tend to have a more prominent yellow mark than FF. Immatures may show

a small yellow spot on the breast. The broad orbital line of (usually) white is broken in front of and behind the eye; in browner gray petronias it may be buffy white. Zimmerman *et al.* (1996) have the appearance of adult and juvenal plumages more or less well-illustrated. Soft-part colors: The bill varies greatly. In adults the color overall extends from pale horn to horn-flesh; the base may be dusky, and the culmen often is dusky gray to blackish grading to horn laterally. Juveniles have a short, pale horn bill, that becomes fleshy gray to pinkish with a gray to blackish culmen and dusky about the base of bill. The mouth lining is a pale to dark pink. Orbital skin is deep gray to black. Eyes are dark brown, or occasionally buff-brown or olive-brown. The legs and feet are gray-slate or blue-gray; in immatures they are gray, tending to darken with age. Fry & Keith (2004) gave no soft-part colors.

FRINGILLIDAE Serins, canaries, various finches

Yellow-crowned Serin/Cape Canary *Serinus canicollis*
Months. Two records, December 1988; casual visitor from highlands to S.

Notes. A M perched for 5 min in the top of an *Acacia xanthophloea* tree beside the river at MK 4 December 1988, and four days later at OD, a flock of eight MF flew in, perched briefly in a croton, then flew off NW. These sites are at 1740 and 1970 m. Lewis & Pomeroy (1989) mapped it to our S and E, in the Nanyuki region. That year was very wet and perhaps caused some movement (Fry & Keith 2004 noted downslope movement in wet seasons). MM are easily identifiable by the very yellow crown and head, the dark eye-stripe, lack of malar marks and much yellow in the wings (forming two broad bars); FF are like dull, pale-bellied citrils. D. Chepus, experienced with it in the Cherangani, noted the flock and identified their fast call series as the flock approached and perched (the call is well expressed by Stevenson & Fanshawe 2001).

Grosbeak-serin/canary *Serinus donaldsoni*

Months. May, September, two records; casual upslope wanderer.

Notes. Reported 3 September 1968 by Sassoon, J. and A. Start, and Horne, and a M seen by us at the bird-feeder at the Center home of R. and C. Francombe 26 May 1989. Attention was drawn to it by its huge pink bill combined with brownish markings in the loreal area and front of the malar, where the similar Brimstone Serin is marked greenish. Lewis & Pome-

roy (1989) mapped it across the N Laikipia Plateau, and in quarter-degree squares 51 A, B and C that surround the study area to the NE and E. They noted that it reaches elevations of 1600 m, attained c. 10 km W of Center and 250 m lower. Zimmerman *et al.* (1996) cited a Rumuruti record SE of us; Rumuruti is at 1870 m, and Center at 1862 m. Britton (1980) mentioned its tendency to wander. Our May 1989 occurrence came following five consecutive, well-above-average rainy seasons. It represented the N S. d. *donaldsoni*, considered a full species by Fry & Keith (2004).

Brimstone Serin/Bully Canary *Serinus sulphuratus*
Months. Common resident at wooded, well-bushed, and some degraded sites.

Ecology. Seen everywhere, including about habitation. Less social and less numerous than the Yellow-rumped Serin. Its numbers fluctuate, and may concentrate around habitation in drier periods. Occurrence in March and October noted only in two years for each. It occurs across the Laikipia Plateau (Lewis & Pomeroy 1989). Well known in southern Africa (Liversidge 1991, Maclean 1993, Steyn 1996, Harrison *et al.* 1997, Tarboton 2001). Feeds on the ground and in trees and bushes; seen working to open *Jacaranda mimosifolia* pods, eats fruit from rinds and peels put out for birds, and observed in the Center meat shed at carcasses, whether for meat or suet, or insects attracted is uncertain. Feeds at dumps, in open pastures, in dooryards, along shores of dams, and in abandoned bomas. Sometimes feeds on road, with other serins and drongos. Often forages in mixed-species foraging flocks, most commonly with Yellow-rumped Serins, but also with cordon-bleus, other serins, Purple Grenadiers, buntings, guineafowl, babblers, and others. Seen chasing a large insect, and flycatches during the emergence of termites. Bathes frequently and drinks often. Eats *Aloe* sp. seeds (see Fry & Keith 2004 for foods).

Behavior. Skead (1960) noted various aspects of display. Chases occur, and interactions within small groups. A group of, say three or four, can readily keep bulbuls and waxbills from areas where they are feeding. MM puff the breast feathers, hold the head high, and droop and flit the wings to F; M may sing to F nearby, cocking his tail, erecting its feathers generally, and partly spreading its wings.

Voice. Skead (1960) and Maclean (1993) treated the voice of southern African Brimstone Serins, while van Someren (1956) gave some song aspects. Its call is variable and usually distinctive; neither a simple "chip" nor double-noted, it is loud, with two sounds,

a "xzheecimp" or "theecent," "phtheec," "chrimp," "brrecept" or "chirrup." The song contains a variety of warbled, whistled, occasionally trilled notes of the ilk of "tzip," "tsee," "twee," "wur," and "zit-it-it," over 4–9 s; it is often uttered repeatedly for 5–10 min, then ceases. Usually given from a conspicuous tree-top perch, several examples of starting notes are: 1) "tzip-tsee-tur-tsee-ee;" 2) "beeta-bee-zee-twee-zee;" 3) "dzee-tsa-tsee-zzee-ta;" 4) "tzeeu, zit-ee-ee, ee-tsee;" and, 5) "tsee-tsoh, pee-tee-tsoh, tziiii." It sometimes rambles note-upon-note, and at other times uses two- and three-note phrases, giving an up-down quality to the song. Once it was heard to mimic the song of Golden-breasted Bunting. At GMF the peak of singing was in July (23% of all song-days), 80% of song was April–September, and 13% of song in December–January (there was more singing in August than in December–January). See also Fry & Keith (2004).

Breeding. Nests and fledged young in February, gathering of nesting material and immatures in April, nest construction and fledglings in June, several nests and groups of fledglings in July, fledglings in August and in December, are our breeding indications. Brown & Britton (1980) had 11 records from our overall region, seven for April–June and four for October and January. Our February breeding records were at Center (1985, 1995), where conditions probably allow breeding at almost any time. About Nairobi, van Someren (1956) had breeding only about the big rains. Our July–August rains probably are of importance to this serin for raising nestlings. The December immatures were also near Center in 1996, so breeding away from habitation is in April–August, with occasional breeding about the centers and possibly elsewhere in December–February (these seasons are in accord with data from songs). Nesting was in woodland edges, in wooded grassland and about habitation. We actually observed but three nests closely, in a broken *Euclea divinorum* at 1.3 m, in the fork of a *Combretum molle* at 6 m, and at 2 m in an orange tree at Center. Each nest contained three eggs or young; eggs we saw were grayish white or bluish white with five-six tiny chestnut spots about the large end, matching eggs shown in Tarboton (2001: Plate 144). The latter and van Someren (1956) described nests like those we found; we saw no spider webs in those observed, nor were FF seen to gather and carry these toward other nests we did not examine. Broods observed in terms of fledglings with parents numbered three in five cases and four once. Among 18 adults examined, seven were not molting (October, November, February, June,

July). The molting birds were starting molt of flight feathers in June–July, in mid-molt August–September and one in April, and completing molt in October–November and (one) February. The serins from February included three in fresh plumage, besides the one ending its molt. Hence the annual molt commences in June–July, and normally ends by November. Molt agrees with April–August breeding in Brimstone Serins.

Specimen data. We netted 18 adults and one (February) juvenile, the latter very green, less yellow than adults. Of adults, three from July–August were MM by cloacal protuberance; their weights, 22.25–23.5 g, were within the range of the others, but two had the longest wings, 82 and 82.5 mm of the seven that were measurable. The 18 weighed 20–24.5 g (22.7 g), and the seven had wings 78–82.5 mm (80.5 mm). These are heavier and longer than in Fry & Keith (2004) for *S. s. sharpii*, but can be of no other race. The rump often looks more yellow than the back. The greenish crown feathers are finely streaked black and extend narrowly down the center of the forehead to the bill, separating bright yellow on sides of forehead to the bright superciliary line. Soft-part colors: The bill is variably a mixture of gray or flesh-gray and horn above, and horn to yellowish with some dusky on the tomsia. Its tip is pale horn in some, dusky in others. The lining of the mouth is yellow-pink to pink-yellow in adults, yellower in juveniles. The narrow orbital skin is gray. The eyes are deep brown, and legs and feet fleshy gray-brown. These augment colors given in the works above.

Streaky Serin/Seedeater *Serinus striolatus*

Months. July, September, December; casual visitor from highlands to S, possibly resident.

Notes. We were surprized not to find this highland serin common, but have seen it only thrice, 4 September 1968 at Nglesha by Sassoan, the Starts and Horne, 20 December 1983 at the Mukutan River (MK site), and N of the Main Gate 9 July 1998. It occurs across the Laikipia Plateau (Lewis & Pomeroy 1989; also Mutara, Olson *et al.*, undated MS, and Pinguone, Schulz & Powys 1998). The study area may be seasonally too dry for it. Britton (1980) considered that it wanders somewhat but we would expect to have encountered more wanderers along the S border if the local population toward Nyahururu were not resident. A pair could reside unnoticed about Nglesha. It is a well-known species (Jackson & Sclater 1938, van Someren 1956, Dowsett-Lemaire

1990, Fry & Keith 2004) of gardens, forest edges, heathland and riverine woodland. Usually illustrated as very brown and white, in fresh plumage it shows strong hints of yellow and greenish tipping and edging, both above and below, the yellow becoming creamy with fading. Its strident call resembles that of the Brimstone Serin. Regularly attacks reflection in glass, often for 1 h or more, in Nanyuki.

Thick-billed Serin/Seed-eater *Serinus burtoni*

Months. May–September, November–December; resident only at Nglesha.

Ecology. More a forest bird than Streaky Serin, it is not conspicuous. Known to the S and SE of the study area and rarely as low as 1200 m (Lewis & Pomeroy 1989). It fed on buds of *Acacia abyssinica*; generally in too dense vegetation to observe it feeding. Also noted at Nglesha by Sassoon and party 4 September 1968. Jackson & Sclater (1938), Chapin (1954), Dowsett-Lemaire (1990) and Schifter & Cunningham-van Someren (1998) discussed aspects of ecology and behavior. Almost always seen in pairs, or singly. Jackson & Sclater (1938) had a record for Rumuruti (mid-Laikipia Plateau).

Behavior. Apparent courtship seen 25 June 1991, the M singing, bowing and cocking tail before an apparent F; the displays were broken off when a closely approaching F batis elicited a chase by the M serin.

Voice. Relatively little known (Clement *et al.* 1993) except for its “tsee-tseep” or “tsit-tseet” call (Dowsett-Lemaire 1990), and a few songs (Zimmerman *et al.* 1996, Stevenson & Fanshawe 2001). A pair together gave soft, bubbly notes. The M of a nest-building pair interspersed calls with fast, rambling songs, mixes of its own phrases with medleys including mimicry (see list below), and its own hard trill. The variable song is a complex warble with some very high notes; examples are: a) a soft “chewooo-chewooo, tsit-it, chewoo, titit, chewooo;” b) “seep-seep-seet, tsee-ew;” c) “tseet-su-weet, ta-ta-ta-ta-ta, seet-sa-wee, tsa-tseet-tseet;”, and d) “tweet-too, chee-cherp, chip-chip, (mimicry), tsit-tsit, (mimicry), tchew-tchew-psee, preew-prew, chee-cher, (mimicry), peep, peep, peep,” and a long terminal trill. The mimicry, not previously reported, includes that of the voices of Chin-spot Batis, paradise monarch, Heuglin’s Robin-chat, Variable Sunbird, Amethyst Sunbird, African Black-headed Oriole alarm call, and Silvery-cheeked Hornbill. The mimicked songs may have been by the same M in May 1990 and August 1992, as the bird was at the same bushes in streamside vegetation at NG. Refer-

ence (Barrow & Demey 2001: 775) to its song as “a soft jumble of tinkling notes” is misleading. Songs were heard May–August and November, and are more frequent and variable than indicated by Zimmerman *et al.* (1996) and Fry & Keith (2004).

Breeding. A nest constructed by a pair at 12 m in canopy of a dense *Acacia abyssinica* 18 July 1991, and another in dense foliage at 6 m in an *Apodytes dimidiata* 27 August 1992. Brown & Britton (1980) had but three breeding records from other parts of our region, in May, August and October. Singing from late May to August is in accord with breeding from late in, or after big rains, through June, and into July–August rains; it may at times breed November–December after the little rains. On 18 July 1991 both adults were carrying material at *c.* 6-min intervals to a twisted-branchlet and small stub forming a “circle” in sub-canopy of acacia. The nest was of fine tendrils and twiglets, with the M bringing mosses and lichens scraped from limbs of the acacia. The F carried bill-fulls of fibrils and fine grass stems, as well as spider webbing. At the August nest we could better see the *c.* 10 x 5 cm cup nest with gray bark flakes and bits of lichen and mosses visible. Within 5 min the apparent F carried bark fibers from *Rhus* sp., a twiglet from the *Apodytes* sp. nesting tree, and a bill-full of lichens and mosses to the nest, accompanied each time by M; she fitted each item into the nest, and turned round and round inside it, pushing here and there with the bill. Once when she left the nest, the M courtship-fed her above the nest rim. The M sang from bush-tops and trees to 40 m away from the nest, using mimicked songs (see above) 09:30–10:30 h, one after another, and then less frequently thereafter. This nest was constructed in spurts of activity. Neither nest could be followed. Probably both were successful; at least both were substantially in place when next viewed three months later (on 9 November 1992 the likely M of the 1992 nesting was singing complexly, but no F seen).

Specimen data. Only one netted, likely a M, 27 May 1989. It had no brood patch or cloacal protuberance, and was somewhat more modestly streaked below than F courtship-fed by a less streaky, presumed M seen later, in 1992, and also at 1991 nest. The individual weighed 34 g and had wings of 87 mm, with fresh plumage. Its secondaries were broadly edged yellow-green, as were greater coverts and tail feathers, while primaries were outwardly lined greenish yellow. Two wing bars formed by the white tips of the median and greater coverts. It showed white: 1) in a small

mark on the forehead, either side of base of the culmen, but not across forehead; 2) in large supraorbital and narrower suborbital partial ring; 3) in mark behind eye; 4) in small mark over eye; 5) at the front of malar in a small area; and 6) in blotched white on fore-throat. The lower breast to belly was white with modest brown streaks. The lores and ear covert area were blackish, the crown green-brown with fine black streaks, and lower throat and breast were deep brown with green tinge and vague, darker streaks. Other birds observed varied in amount and placement of facial white marks (all had some white on the forehead), and in the thickness of ventral streaks. They represent the central Kenyan *S. b. albifrons* (Fry & Keith 2004). Soft-part colors: Bill gray-flesh with horn at the tomlia of the maxilla, and yellow-horn to horn-yellow below. Bill is different, other colors as in Fry & Keith (2004).

Stripe-breasted Serin/Seedeater *Serinus reichardi*

Months. Resident, locally common but decreasing in 1990s.

Ecology. Occurs at all woodland and wooded grassland sites except very wooded KS, OD, and PO, but in decreasing numbers after 1992. This is not a social serin; we rarely saw more than five, these likely being family groups; most often seen singly or in pairs. Occasionally joins mixed-species foraging flocks, feeding with the ubiquitous Yellow-rumped Serins and Red-cheeked Cordon-bleus, and occasionally with other finches such as petronias. Not shy, but inconspicuous except when singing or displaying hence considered local and uncommon (Britton 1980, Lewis & Pomeroy 1989, Fry & Keith 2004). Found in thickets and open bushland with *Acacia abyssinica* about NG at 2000 m, so the restriction of 1600–1800 m by Lewis & Pomeroy (1989) is outdated (see Fry & Keith 2004). Forages for seeds on the ground, eats maize meal put out for birds, and seen gleaning for aphids and scale insects in various shrubs. Also eats fruits, e.g., fed among other birds on fruits of *Ficus glumosa*, and one seen to feed a fig to its presumed mate. Drinks regularly, bathes as well, seen sunning three times and once feeding on salt in barren ground at a broken salt block (at FS). We see it occasionally at Nanyuki (1950 m). No movements are known.

Behavior. Very little known (Jackson & Sclater 1938, Chapin 1954, Clement *et al.* 1993, Fry & Keith 2004; reported in some southern African literature under *S. gularis*). Courtship feeding has been observed several times, and also butterfly-flight displays (Cha-

pin 1954) and a circular flight display over 200 m in diameter, including mimicked song.

Voice. Various calls noted, including a cardueline twangy up-down phrase (“zha-wee-oo, wee-oo, wee-oo” to “swee-zaa, swee-zha”), or shorter calls (“pew-ew,” “peew-teew,” “chee-ew-ew,” and “chee-ur”), sometimes included in songs, and in our area, diagnostic for it. Also heard: a “weep, weep” and “weep, wep,” a “twee-see-ee-ee-ee” resembling some calls of Yellow-rumped Serin, a “ta-weet, ta-weet” series from a F as a M attempted copulation and, from one in net bag, a “rrr-err.” Approximately 70% of its songs feature rapid bursts of mimicry of more than 19 species of birds (Short & Horne 1985); this mimicry in its song occurred April–September and November–December. Mimicked song as important part of singing of *S. r. striatipectus* has been documented by us (Short & Horne 1985), and also (S Ethiopia, representing *S. r. erlangeri*, a synonym of *striatipectus*) by Benson (1947: 47), who reported its “beautiful and varied” song as including mimicry of Tawny-flanked Prinia, Bronze Mannikin, African Firefinch, and Cinnamon-chested Bee-eater. Stevenson & Fanshawe (2001) noted mimicry by *S. r. reichardi*, but we have failed to find references to mimicry in related *S. gularis* of S Africa (reported for the last by Clement *et al.* 1993, but that likely from Mackworth-Praed & Grant 1963: 689, which probably originated in Mackworth-Praed & Grant 1960: 1071 – there treating only *S. reichardi* with races *reichardi*, *striatipectus*, and “*erlangeri*,” drawn from Benson 1947).

The song consists of a medley of warbled, whistled, trilled and mimicked phrases with twangy notes that identify it. Common in mimicry of more than one singer were songs and calls of Crowned Hornbill, both tchagras, Cardinal Woodpecker, Heuglin’s Robin-chat (calls and song phrases), Red-faced Sylvieta, Golden-breasted Bunting, and *Zosterops* spp. Otherwise notable were songs mimicked of Collared Sunbird, Black Cuckooshrike, Blue-eared Glossy Starling, orioles, bulbuls, Sooty Boubou, Rufous Chatterer, Hemprich’s Hornbill, tits, cordon-bleus, and scrub-robins. Some songs last 50–130 s without a break and may be virtually all mimicry, but usually there are pauses or breaks at *c.* 20 s intervals. Songs are loud and mimicry exact and clear. Remarkable was the use of mimicked song by this serin in the mobbing of Pearl-spotted Owlets on three occasions. The song is usually delivered from the top of a tree or tall bush, the M rendering these over an area of *c.* 8 ha, although territories are much larger than this (we heard no

more than one singer per site). One M sang, covering a large territory (not always within range of hearing) at GMF for as long as it was present there (last heard July 1996) on a total of 111 days of six years. Of these, 9% were in October–March, the rest in April–September, with 53% in July–September and 38% in April–June. Of 202 days in which heard and noted singing at other sites, 17% were in October–March, 36% in April–June and 47% were in July–September; both at GMF and elsewhere the peak was in July. In addition to loud and entertaining songs, Stripe-breasted Serins also sing *sotto voce*, in subsong without mimicry, twittery and twangy, with “chewy” and “twee-yeé” notes prominent. MM also sing, with mimicry, in circular, up-down flight, sometimes “butterfly-flight” (see Skead 1960) over 150–200 m and back.

We were able to compare our *S. r. striatipectus* songs with those of its nearest relatives, the southern *S. gularis* sensu stricto and *S. mennelli* on the recordings of Gibbon (1991) and Stjernstedt (1986–90). The more twangy longer songs of *S. mennelli*, and its call notes, more closely resemble those of our *S. reichardi* than do vocalizations of *S. gularis*. No mimicry was reported for the S two serins by Priest (1936), Chapin (1954), Skead (1960), Maclean (1993), and Borrow & Demey (2001), among others. Clement *et al.* (1993) attributed mimicry to *S. gularis* because they included *S. reichardi* and its races as races of *S. gularis*. A behavior not known in *S. reichardi* and reported by Priest (1936) and Clement *et al.* (1993: 197) for southern *S. gularis* is its gathering at times to forage on cultivated grain, becoming a serious pest. Further studies of vocalizations of all these taxa are needed. Since we have no information on mimicry of *S. r. reichardi* from Mozambique, Tanzania and Zambia, it is conceivable that the Kenyan-Sudan-Ethiopian *striatipectus* is specifically distinct from the former. Note that *S. gularis elgonensis* is sympatric with *S. r. striatipectus* in W Kenya (Fry & Keith 2004).

Breeding. We have no definite nest, probably because of the large territories and its likely nesting outside the netting sites. However, we observed the carrying of nest material along the wooded grassland slope of UL in July, saw copulations at MK and EG in August, courtship feeding in January and June–August, and juveniles (at ML) in July, as well as cloacal protuberances of MM in June–August, all indicative of breeding. The peak of song in July and occurrence of mimicked songs and flight songs only April–September and November–December suggest breeding about the

big rains into the July–August rains, and following the little rains. Brown & Britton (1980) and Fry & Keith (2004) had no records of breeding from our region, and only a few from areas SW and W, with different rainfall regimes. The juveniles seen were more brown and streaked above and well-streaked below, with streaks more distinct. Copulation was preceded by begging of the F, courtship-feeding by the M, and the F calls noted above. The serin with nesting material carried a stalk of an herbaceous plant across a heavily grassy and bushy slope, and could not be followed. Breeding occurs in June–August at least.

Specimen data. We netted 10 adults, five MM (cloacal protuberance present, plus singing full songs on release), and five of indeterminate sex. Overall the 10 weighed 14.75–17 g (15.9 g), and nine measured wings were 72–79.5 mm (77.2 mm). The MM showed slightly greater weights (16.3 *vs* 15.6 g) and wing length (78.3 *vs* 76.3 mm) than the five birds of mixed sex, hence MM likely are a bit larger than FF. Taken in April–September, only one of 10 showed molt, on 26 June, and it was only molting the outer 3 pairs of rectrices. Molt probably occurs late in the year, after breeding. The plumages were quite variable in color, from warm brown with a green tone to faded, worn brown. Green was evident in several individuals at rear of ear coverts, along edges of the back-feather streaks, on rump and uppertail coverts, and in wing coverts. This green is like that seen in fresh individuals of Streaky Serins. We describe the birds in detail, because published illustrations are generally too “washed out” and dull brown, or too blackish compared with our birds. The crown is white with broad brown-black streaks, becoming finely streaked on the (white) forehead; the superciliary stripe is broad and creamy white. The back and wing coverts are olive green-brown with blackish, vague streaks; rump to uppertail greenish brown with fine streaks and some buff-white edging. The rectrices are olive and brown-black with yellow-white tips. The brown wings have white forming bars at tips of the median coverts and inner greater coverts; greater coverts have greenish outer edges when fresh. The lores to anterior ear coverts are black-brown, blacker dorsally, the rear of ear coverts is streaky olive-brown and cream (books illustrate this area too uniformly dark). Ventral streaks are broadly brown-black, the feathers edged cream-white. Worn birds are more brown and white, having lost much of green and yellow to fading. Many Stripe-breasted Serins show finer streaking and more creamy white on the sides, flanks and belly, and more closely resemble the Yellow-rump-

ed Serin, which has a yellow rump and distinct marlar mark. Soft-part colors: Bill gray-brown to brown-horn on maxilla, the tomia and tip sometimes being colored horn; mandible fleshy gray, horn-yellow or horn-pink (the tomia may be horn-colored and the base may be grayish). Mouth lining pink-yellow to horn. Orbital skin gray-brown to gray-black. Eye dark brown. The legs are fleshy gray-brown. The birds represent *S. r. striatipictus*, which is browner and ventrally much more heavily streaked than grayer *S. r. reichardi*, which has fine if distinct streaks on the breast (contra Zimmerman *et al.* 1996: 697, who credit the latter with darker brown breast streaks than the former); see illustrations of nominate race in Benson *et al.* (1971, Plate XII, very well done), Clement *et al.* (1993, Plate 7), Aspinwall & Beel (1998: 61) and Stevenson & Fanshawe (2001, Plate 284) for this feature. Fry & Keith (2004) incompletely describe *S. r. striatipictus*.

African Citril *Serinus citrinelloides*

Months. May–August; casual visitor from S, eight records in six different years.

Notes. Not common, as might be expected, probably because of uncertainty of rainfall. Half the records were at Nglesha, a M perched on three occasions, and a pair feeding in mud near three Quailfinches at the water crossing there, in June–July. We also saw a pair at the Whydah Area 29 May, one flying at Center 11 July, two at Big Dam (on the dam wall) 15 August and a M perched near the Center garden 18 August. Usually feeds on flowers of various thin-seeded types (see van Someren 1956), but we have seen a pair eating one fig after another at a *Ficus* sp. with bulbuls, white-eyes and colies. It occurs across the S area of Laikipia Plateau to Nanyuki (Lewis & Pomeroy 1989, black-faced MM, race *kikuyuensis*).

Yellow-rumped Serin *Serinus reichenowi*

Months. All; numbers vary but often ubiquitous, one of the most common birds.

Ecology. Occurs in large numbers April–August, dropping off in September–October; fewer records November and February–March, more records December–January, but those months about equal to September, and fewer than in April (or any of May–August). Not present in all years from October to March. Seen in large flocks or many smaller flocks, particularly in April–July and September–November; flocks to 200, but when incoming swarm the roadsides almost continuously. Thus, social, with displaying and pair behavior often in small flocks. Forages mainly

on the ground and low in bushes, eating grass seeds and spilled maize meal. Hawks termites during emergences, and is very agile, flying upward to 15 m, circling and trying again if the first attempt was a failure. In January seen feeding on figs *Ficus glumosa* with frugivores. Often feeds in mixed-species foraging flocks, especially with cordon-bleus and Brimstone Serins; frequently seen during April with ground-foraging Willow Warblers, and often with starlings, particularly Blue-eared Glossy Starling. Over 25 species of birds noted foraging with it, including lapwings, helmetshrikes, other serins, waxbills and finches, bulbuls, tits, flycatchers, babblers, larks, drongos and thrushes. Although observed everywhere favors woodland edges, overgrazed areas with bare ground and low grass, degraded woodland, lawns, airstrips, open areas about the dams, *Combretum* grassland, and open bushland, including nearly pure stands of leleshwa *Tarchonanthus camphoratus*. It occurs across Laikipia Plateau; our study area may be the source of wet-year “invasions” of the Lake Baringo area (Stevenson 1980, Lewis & Pomeroy 1989). Drinks frequently, bathes occasionally, even in elephant splashing around tanks. Joins in mobbing snakes and birds of prey, e.g., a fish-eagle with prey over Big Dam, and an Eastern Chanting Goshawk. Other habits are probably like those of its near-relative *Serinus atrogularis* (Skead 1960, Clement *et al.* 1993), from which we separate it, following van den Elzen (1985).

Movements. Largely leaves study area September–November in most years, returning April–June. Probably none is resident during drought years; some remain October–March in some years. Only widely scattered, small flocks usually are encountered November–March.

Behavior. Not well known, particularly since often treated as race of much better known southern African *S. atrogularis*. The Yellow-rumped Serin is highly social, individuals rarely watering alone, even when nesting. Thus engages frequently in confrontations and chases, displays and singing in flocks; three or four, perhaps young MM, may move about together, two, three or even four singing at one another, then going off together. When singing, perches upright, with head back and crown feathers erected into a “crest;” beats its wings at any nearby singer, and bustles off in chases, rump feathers partly erected and rump patch conspicuous. Also bounces about, “dances,” cocks tail at times, to presumed F, and courtship-feeds her. Has display flights probably very like those of southern Black-throated Serin or Canary *S. atrogularis*

(Skead 1960, Liversidge 1991, Maclean 1993, Fry & Keith 2004). One was the object of displaying by a Straw-tailed Whydah, and we have seen individuals of this serin chased by other whydahs, bulbuls and drongos, all species with which it forages and that could react aggressively to within-species displays of Yellow-rumped Serins.

Voice. Little known, for reasons noted above (see Zimmerman *et al.* 1996). In hand calls “skreek” or “kreep;” has an often twangy “twee-ee-eee-eee” call note, or a shorter “pweew” or “twee.” An apparent M following a F to which it displayed, called “cheet-cheet.” Several coming to water often include one or two singing repetitive, short phrases, a “see-ew, sa-wee-sew, see-ew.” Also sings in flight and during chases, a twittering, rambling series of “wee,” “chip,” and “tyi” notes, sometimes with trills. From a treetop sings a long, clear, less twangy warbled song, a “pee-wa-chee, chee-ur, twee-eee, ta-pee, chur, wit-see-a-chee, kur-tsee, tsa-wee-a-wur,” sustained for a min or more. Songs we have heard contained no mimicry. Nesting MM may sing in 0.5 h bursts, usually not very early or late (we have heard it, rarely, as early as 06:09 h and as late as 18:51 h, but these were exceptional). Of 196 days in which we heard it singing, and noted such, at GMF, 26% were in November–February, 39% April–June and 35% July–August). Similar results came from other sites, with 333 “singing days” apportioned as 22% November–February, 41% March–June, and 37% July–October, peaking in May, with a drop in June, rise to July, then a gradual drop until October. Episodes of sustained singing showed a parallel pattern, except that it occurred in two spurts of April–May and July–September, with essentially none from October–March.

Breeding. Brown & Britton (1980) had 22 records from our general region, three in December–January and 19 in March–July, peak in May–June, these not likely from our subregion. Our records include seven nests and two sightings of birds carrying nesting material, all in June–September, with a peak in July. We saw displays and courtship-feeding in April–May, two MM with a cloacal protuberance in May, fledglings with adults August–October and January (at least three groups in flocks in 1995 only), independent juveniles September–November, and copulation and courtship-feeding in October. Breeding in our area is from late in the big rains through and beyond the July–August rains, with perhaps occasional breeding October–January (little rains). The seven nests were at 1.5–4.6 m (3.3 m) in *Euclea divinorum* (two), *Acacia gerrardii*, *Combretum molle*, *Tarchonanthus campho-*

ratus, *Dodonaea angustifolia*, and *Pyrostria phyllanthoides* trees, and were woven cups between branchlets, usually with leaves somewhat hiding them. In two cases in which both of the pair were present, one collected nest material and the other, probably the M (which sang in one instance) followed the first closely. Nests were tightly woven, of fine twiglets, rootlets, grasses, fibers, bark strips (fine *Combretum* bark pieces), mosses and spider webbing (in at least two nests), with a lining (in four cases where seen) of downy white lelesha seed “fluff.” One nest had several leaves tucked into the web-bound nest, and two had bits of mosses attached to the outside. The eggs were not observed closely. Four nests eventually were seen to contain two (three instances) and four young. Fledglings seen most often numbered three, but overall, two to four seems to be the clutch. Fledged young quickly move off with their parents, usually joining small- to moderate-sized flocks. Juveniles are browner overall than adults, with more spotting and streaking of the underparts (breast, throat, sides, flanks). The nest, clutch and other details are very poorly known (Fry & Keith 2004). One nest we could reach measured 8.9 cm across and 5 cm deep.

Specimen data. We netted 14 adults, a juvenile and an immature shifting to adult plumage. These represented January and May–October, the two younger birds being netted in September and October. The 14 adults included four MM weighing 10.75–12 g (11.3 g), these not differing appreciably from the other 10 of both sexes (10.25–15 g, mean 11.4 g). The wings of 10 adults were 64–71 mm (67.75 mm), with three MM having wings 64, 68 and 68 mm, not differing from and thus included in the 10 adults. The juvenile weighed 9.5 g, and the immature changing to adult plumage was 10.5 g. One adult had its right eye destroyed (it weighed 10.5 g and had wings 68 mm, was in good condition). Adults have generally fine dark streaking across the breast, a strong white or yellow-white eyestripe, and a distinct brown malar line (lacking, or indistinct in Stripe-breasted Serin). The feathers of the upperparts are deep brown along the shafts and have a “frosty” gray-white about the margins. The strongly yellow rump often is visible laterally, especially in displaying. Only four adults were molting, one completing the molt in June, an August serin in mid-molt, and two October birds, one in mid-molt, the other completing the molt. Both young birds were molting heavily, so the post-breeding annual molt likely is July–November; perhaps a few that may attempt breeding December–January or February (or later?), completing the molt March–May. Soft-

part colors: Bill very variable, from pink-horn to black on the maxilla and gray-horn to horn or yellow-horn on the mandible (possibly there is seasonal variation). The mouth lining is pale yellowy pink. The eye is dark brown and the legs and feet are fleshy brown. The bill and worn feathers often show earthy brown or rusty stains.

White-bellied Serin/Seedeater *Serinus dorsostrigatus*

Months. April, July, two records; casual, probably up-slope wanderer from Lake Baringo.

Notes. Mainly below 1500 m, but occurs to 1900 m or more, and wanders (Britton 1980, Lewis & Pomeroy 1989); the latter authors' map it fully across the Laikipia Plateau, even in quarter-degree square 51 D, which is above 1600 m, and mainly above 1800 m. Breeds at Lake Baringo, where a common resident (Stevenson 1980), and also occurs at Pinguone Ranch to our E (Schulz & Powys 1998). Three landed in an acacia at TA (Fig. 8), one a M, then flew over us 17 April 1993, and an apparent pair landed in a croton at CS, then flew E 8 July 1992. As we constantly noted belly color in the yellow serins, particularly the Brimstone Serin that we saw, we were gratified finally to see distinctly "white-bellied" serins on these two occasions. The extensive yellow on the head and some streaking on the flanks were observed; all had white from the belly through the undertail coverts, i.e., of the race "*maculicollis*" (see Fry & Keith 2004: 484).

EMBERIZIDAE Buntings

Cinnamon-breasted Rock Bunting *Emberiza tahapisi*

Months. Locally common resident, possible migrant or visitor, few January–March records.

Ecology. Seen throughout the study area; flies far to water, occasionally at GMF, and dams without adjacent rocky slopes that they favor. Only three January–March records and few for April and October, regular May to September, present in at least seven years November–December; it seems likely that some buntings leave the area September or October. Many sightings were along rocky roadsides from the vehicle, although singing could be heard at a few sites (e.g., MK, MB) from nearby slopes. Rocky slopes in open bushland, *Combretum* grassland, and around old bomas (Saddle Boma, High Boma) were typical sites at which we saw and heard them. Found in the road at appropriate locations very early in the morning. Usually feeds, presumably on seeds and insects, on the ground, sometimes loosely with larks, serins, and occasionally Golden-breasted Bunting. Large territories are suggested by its often flying alongside our vehicle

(thus along the roadway in which it forages), sometimes for 300–400 m before angling to the side or reversing direction. It drinks regularly, and bathes frequently. Grits along road and in a gravel pit near a road. Occurs throughout the region (Lewis & Pomeroy 1989) and from Senegal and Arabian Peninsula (Cramp & Perrins 1994b) to South Africa (Maclean 1993, Harrison *et al.* 1997).

Movements. It is known to wander (Britton 1980, perhaps regular movements; Lewis & Pomeroy 1989), and is certainly much less often observed January–March. It could move away from roadsides for that period. Moves S in dry season in W Africa (Borrow & Demey 2001).

Behavior. Well known (e.g., Chapin 1954, Liversidge 1991, Maclean 1993, Fry & Keith 2004). M flits wings, bows, "dances" before F, sometimes while F carries nesting material. MM may fight in the presence of a single F.

Voice. Sonograms in Maclean (1993) illustrate a form of the song and the call note. The rather short, shrill, buzzy song somewhat resembles those of the Fawn-colored Lark and the Boran Cisticola, but it varies; sometimes is only an upward inflected "seee-eeee-eeee." Sings from a rock, the road and trees, even tall acacias on occasion. Songs heard from only a few of our honeyguide study sites, especially in MK (from rocky slopes SW, NW, E), MB, PK, and TA hence we missed most songs; our moving vehicle likely silenced singers when we stopped momentarily. Of some 51 "song days" when we observed it singing, over 90% were in May–August, and over half (28) were in July. We heard no April songs, so singing begins late in the big rains and onward through the July–August rains.

Breeding. Few breeding indications, as we did not work in the haunts of this bunting. Nonetheless, courtship activity in June–July, carrying of nesting material by FF in June–July, and adults feeding fledglings in July, August, and September (26 September in both 1986 and 1988), indicate breeding June (indications onward from 20 June) through September, thus agreeing with the May–August regime of singing. This contrasts sharply with Brown & Britton's (1980) eight records for the region overall, representing January–June, with six of the records March–June, within the period of the big rains, but likely having no records from our triple-rainfall subregion. Mackworth-Præd & Grant (1960) also gave March–June (S Kenya); Fry & Keith (2004) had January–June for our region. The nesting materials in the bills of FF appeared to be fine grasses and a tiny rootlet. In the seven years found in

November–December, a song was heard twice and there were no breeding indications.

Specimen data. One M coming to water was netted 5 October 1989 at MK. It weighed 13.75 g and was completing wing and tail molt, and in heavy body molt. Although of the same (nominate) race as southern African birds, the Kenyan buntings are smaller, and notably smaller than are Golden-breasted Buntings (in South Africa, the two appear similar in size, see Maclean 1993). The M's bill was brown on the culmen and upper maxilla, sharply turning to gold-yellow on the tomia and lower base, and on the entire mandible.

Golden-breasted Bunting *Emberiza flaviventris*

Months. Common, present at all wooded sites, resident.

Ecology. Found in open woodland, woodland edges, open riverine woods, bushland, wooded grassland and gardens, forages on ground and in bushes and trees. Taller trees are usually present where it occurs. Well known (Jackson & Sclater 1938, Chapin 1954, Fry & Keith 2004). Occurs throughout the area, a common highland bird (Lewis & Pomeroy 1989). Often eats insects, and feeds them to the young. Hawks flying termites and other insects, and is very adept at catching them; one F took four insects in one twisting, circling flight. Also eats grass and other seeds. Walks on the ground occasionally. Often feeds in mixed-species foraging flocks, most frequently on the ground with finches, especially Yellow-rumped Serins and cordon-bleus, less often with rock buntings (beside roads), pytilias and grenadiers. Also feeds with weavers, drongos, Brown Babblers, and less often with Crowned Lapwings, Pallid Flycatchers, helmetsrikes, thrushes, white-eyes and various warblers. Usually occurs in pairs in such flocks and elsewhere, or in family groups; rarely are numbers seen near one another. Takes grit, drinks and bathes often. Seen sunning in tall acacias. Its undulating flight is conspicuous.

Behavior. Well known (above references, and Liversidge 1991, Steyn 1996). Occasionally sings in flight and once (M) in floppy flight over F in nest.

Voice. Reasonably well known (references above). Has single-noted begging call that is loud, a "pseet." Adults at nest call "sweet" or "tch-weet," and give "cheep" notes when feeding the young. The usual call note rather closely resembles the calls of social dwarf mongooses, a "too-tcheer," "pee-yeeear," "screee-terr" or "pt-eeear" to "zheep;" sometimes gives "zheeeeeeep," plus a fast rising trill, or a half-call, "screee." The song is usually simple (Chapin 1954, van Someren 1956),

but not always so (see sonogram, Maclean 1993); it resembles that of the White-eyed Slary Flycatcher. It occasionally ends in a trill. Some very simple songs are: "wee-see" (repeated to five times); "ta-cheet-" (up to eight times); "terch-ew" or "pa-teech-ew" (repeated c. three times); and "chee-chee-wee" (repeated c. three times). There may be one or more introductory notes, thus "cheee, chee-cha-wee," or "cho, cho, chee-chew, chee-chew." Two longer songs are: "chee-chee-wee, chee-cha-wee, chee-chee, chee-chee, cha-wee," and "wee-see-wee, wee-see-wee, wee-to, wee-to, wee, ti-ti-ti-ti." The notes are usually whistled and piping, and readily mimicked by a human. We have 391 "singing days" observed. The peak is in May, and 93% of song-days were in April–August, with 6% November–February representing a very slight peak. Breaking down April–August by month, we have 15% of such days in April, 38% May, 20% June, 17% July, and 3% August. Long-sustained bouts of singing, and dawn and "dusk" singing (05:28, more usually 05:45–06:13 h, and 18:30–18:50 h) on 153 days numbered 97% in April–July (2.5% in August plus December–February), peaking in May, accent the predominance of April–July singing. Songs occasionally were uttered from the ground, or on the wing, or from a treetop but more often M sang from a busstop or small tree.

Breeding. Few nests were noted. Nests in May (eggs, fledged 15 June), June (young fledging), and July (two, under construction). Males with cloacal protuberance were observed in April (two) and December (two), fledglings noted fed by adults in June (five instances) and July (twice), and independent immatures were about the sites August–October, and in December (three cases). Nesting is mainly May–August; there likely is sporadic breeding after the little rains (October–November) and some immatures of October and December may have resulted from second nestings (van Someren 1956 reported up to three broods per season about Nairobi). Brown & Britton (1980) had 25 nesting records in our region generally (likely none from our subregion), seven in December–February (28%), 17 in March–May (68%) and one in July (thus the typical bi-seasonal big rains and little rains breeding is indicated). In the study area most breeding is late in the big rains and onward into the July–August rains, as suggested also by occurrence of songs (see above) mainly April–July. Nests we could see or glimpse were at 1.2–4 m (2.5 m, four nests) in *Euclea divinorum* (two), *Rhus natalensis* (one), and *Carrisa edulis* (two). The *Rhus* nest at 1.2 m of a 1.5 m tree damaged by fire had a 10.2-cm cup nest of grasses, rootlets, twiglets and fibrils on a small branch just

off the main stem; the inside was lined with finer fibrils and tendrils. It had many Mallophaga in it, and two whitish eggs with a narrow band of purplish streaky spots near the larger end (see Tarboton 2001: Plate 146). The eggs were seen 28 May and we saw the second of the two young leave the nest 15 June, so the nestling period was close to the 17 or so days given by van Someren (1956) and Maclean (1993), and more than the 12–13 days allowed by Tarboton (2001). The adults fed insects to the fledglings. A nest in a *Euclea* canopy at 2.4 m appeared to be of fine fibers and twiglets, c. 10 cm wide. It fledged more than one young in June. We observed three fledglings once; others observed with the parents numbered one or two, but we could have missed one. We have no definite evidence of the raising of two broods.

Specimen data. We netted 32, 24 MM, seven FF, and an immature. Several were netted again later, including one at 5.5 years after banding and one banded as an adult M 2 January 1986 and retrapped 7 years and 10 months later 20 November 1993. The MM were 19–22 g (20.5 g) in weight and 19 had wings of 80–90 mm (83.8 mm). The FF were at 18–21.5 g (19.6 g) and five had wings 73–81 mm (77.4 mm), thus being lighter and shorter-winged than MM. The immature was 19.5 g. We refer these to the nominate race, noting Chapin's (1954) remarks (see also Fry & Keith 2004). There is a clear white line of orbital feathers below the eye in MM (buffy in FF). We netted few buntings August–October, when molt might be expected (after breeding); two September individuals were starting the molt, and at mid-molt. One was starting molt in May (eight other May–July birds were not molting). Otherwise, a November bunting (one of four) was ending its molt, and birds in January and February included five ending the molt and three in fresh plumage. Non-molting adults (22) were in November–July. A newly hatched nestling 3 June 1990 was fleshy brown-skinned, naked except for several gray tufts of down (crown, back), and had yellow gape corners (see van Someren 1956); it was fed small grasshoppers by its parents. Soft-part colors: The bill varies in color, perhaps seasonally (see, e.g., Jackson & Sclater 1938 and Maclean 1993). The maxilla usually is darker in MM, dusky black on gray-black; if paler, tomia and tip are black. The maxillary base behind nostrils may be pinkish. In FF, the maxilla is more brown to horn; tip may be black. The mandible is horn-pink to pink; its tip may be paler or darker. The mouth lining is dull pink to yellowish pink. The immature had bill like that of F, with an all-pink max-

illa and yellow gape traces. The eyes are dark brown. The legs and feet show flesh-colors to pink, variously tinged brown, dusky or gray, or may be of darker color, tinged pinkish.

Somali Golden-breasted Bunting *Emberiza poliopleura*
Months. December–January (six records), May, September, October; upslope wanderer from W or NW.
Notes. Seen in the Whydah Area (1830 m), an overgrazed, elephant-bashed open, grassy area with short *Acacia gerrardii* and other trees, 3 May 1985, 16 September 1986 (M), 16 December 1986, 4 January 1987 (possibly same M September–January), 25 October 1987, and 25 January 1988; and at MK 1 January 1986, and the acacia crossing N of the Whydah Area 26 January 1992. All were of single MM except for the records of May 1985 (Short & Horne 1985), and the acacia crossing (pairs). The major feature of this species compared with the Golden-breasted Bunting is the mottled brown-chestnut and buff-white to pale gray back (vs the rufescent chestnut back of the Golden-breasted with dull gray edging of the feathers when fresh; often virtually pure rusty). This mottling is visible at a distance, and extends into wing coverts. The median and greater coverts of the wing are not more white-tipped, but have more lateral pale edging than in Golden-breasted, so the wing bars appear more diffuse and the wing overall seems whiter. Other features, such as the whitish gray rump, whiter tail, sides and flanks were noted in the Somali bunting. The first M seen was foraging loosely with a dwarf moongoose-drongo-babbler-dove assemblage in an open area S of the Mukutan River (1 January). Usually reported as occurring below 1200 m (Lewis & Pomeroy 1989, who mapped it in quarter-degree square 51 D, essentially above 1600 and mainly over 1800 m, which latter is noted in Stevenson & Fanshawe 2001), but Britton (1980) mentioned its wandering, and occurrence at night and dawn at Ngulia, SE Kenya suggests movements. In any case, the Lake Baringo-Lake Bogoria (Hartley 1986) population is but 15–22 km to W of our sightings. Our records were in the post-drought (1984) years 1985 to January 1988, during a series of below average (1984, 1987) and barely average (1986) years for rainfall, before heavy rainy seasons of 1988. Finally, the 1992 record was in the third of three consecutive dry years preceding very dry 1993. The vagrants we saw may have been moving in search of better foraging opportunities. Perhaps significant is that none of these birds was vocal and the diagnostic dwarf moongoose-like call of Golden-breasted Bunting was not heard from them.

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