

Migratory flyways of raptors and owls in Kazakhstan according to ringing data

By Sergey Sklyarenko, Eduard Gavrilov and Andrey Gavrilov

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Between 1939 and 1999, the Institute of Zoology in Kazakhstan received information on 165 recoveries of 21 species of raptors and 2 species of owls. Of these, 71 were both ringed and recovered in Kazakhstan, while the remaining 94 were either ringed or recovered in one of 22 other countries. Recoveries of Common Buzzard, Lesser Kestrel and Pallid Harrier from southern Africa and Europe (South Africa, Zaire, Tunisia, France) suggest that they are the most long-range migrants. Red-footed Falcon, Kestrel and Long-legged Buzzard recoveries are from the Middle East (Syria, Lebanon, Turkey, Greece). Finally, all Black Kite, Hen Harrier, Goshawk, Sparrowhawk, Steppe Eagle, Upland Buzzard, Saker, Merlin and Long-eared Owl recoveries are from the Caucasus, Central Asia, and Pakistan. The northern populations of many raptors migrate via Kazakhstan and, accordingly, there are also recoveries of Black Kite, Goshawk, Sparrowhawk, Hen Harrier, Montagu's Harrier, Pallid Harrier, Merlin, Kestrel and Long-eared Owl from Siberia. Only two recoveries (Saker Falcon and Pallid Harrier) are recorded from Asia south or east of Kazakhstan. These data suggest that the general direction of migrations through Kazakhstan is north and east in spring, and south and west, in autumn. Black Kite, Pallid Harrier, Sparrowhawk, and Long-legged Buzzard, Saker, Kestrel, and Long-eared Owl from Northwest Kazakhstan migrate east of the Caspian Sea, and birds from other regions fly through south-east Kazakhstan and Middle Asia. The relationship between migration distance and probability of presence of species in Kazakhstan in winter is discussed.

Key words: birds of prey, raptors, ringing, migration, flyways, recovery, Kazakhstan.

Addresses: Institute of Zoology, Akademgorodok, Almaty, 480060, Kazakhstan. E-mail: InstZoo@nursat.kz

1. Introduction

Kazakhstan is situated just in the centre of Eurasia, between the Caspian Sea, Siberia, and China. Due to its geographical position and size (> 2.7 million km²), the country is on the migration route of many species of birds from within the country and from western Russia, Siberia, Mongolia and China. Included among these are 52 species of raptors, 44 of which breed in the country (33 diurnal raptors, 11 owls; KORELOV 1962).

Bird ringing began in Kazakhstan in 1926, and from that time until 1966 about 46,200 birds were ringed in the Republic. In the mid 1960's, the annual number of birds ringed in Kazakhstan increased dramatically with the creation of the Chokpak ringing station and the increase in other mass ringing programs by the laboratory of Ornithology at the Institute of Zoology. As a consequence of the implementation of these programs, sufficient numbers of birds were subsequently ringed to generate good information on raptor migration (GAVRILOV 1979).

In this paper, we use data from ringing returns to evaluate characteristics of migrations and geographical relationships of birds of prey which breed in or migrate through Kazakhstan. We also integrate our data with those from other, older records from studies which have not received attention in recent literature.

2. Study Area and Methods

The ringing station Chokpak is located on a pass between Talassky Alatau and Karatau ranges in Western Tian-Shan (42°31'N, 70°38'E, GAVRILOV 1979). Birds migrating south from Siberia, China, Mongolia and eastern Kazakhstan all fly along the Tian-Shan and cross the pass at this point. In addition, birds from Western Kazakhstan and Russian Ural region sometimes travel along this route. Migrating birds are trapped annually in spring and fall with both modified Helgoland-type stationary traps (BORODIKHIN & GAVRILOV 1976), and with portable snares designed specially for raptors.

In addition to ringing migrating birds, nestling and adult raptors have been ringed in conjunction with research at several locations within Kazakhstan. Nestling Steppe Eagles (*Aquila nipalensis*), Long-legged Buzzards (*Buteo rufinus*), and Kestrels (*Falco tinnunculus*) were marked in Western Kazakhstan between 1964 and 1972 (LINDEMAN 1976). A ringing program for White-tailed Eagle (*Haliaeetus albicilla*), Imperial Eagle (*Aquila heliaca*), Saker Falcon (*Falco cherrug*), Kestrel, Red-footed Falcon (*F. vespertinus*) chicks was begun in the 1970's at the Naurzum National Nature Reserve in northern Kazakhstan by E. BRAGIN. Additionally, birds of several species, including eagles (*Aquila chrysaetus*, *A. nipalensis*, *A. clanga*, *Hieraetus pennatus*), harriers, large falcons (*F. peregrinus*, *F. cherrug*), some others and owls (*Asio* spp., *Otus* spp., *Bubo bubo*, *Athene noctua*, *Strix aluco*, *Aegolius funereus*) were ringed in small numbers during species specific studies at various locations throughout Kazakhstan. Finally, Common Buzzards (*Buteo buteo*) and Pallid Harriers (*Circus macrourus*) were banded in mass at wintering areas in Africa (OATLEY 1983), and Saker Falcons confiscated from poachers were ringed and released at several locations in Kazakhstan in the 1990's.

Until recently, ringing was carried out solely with Moscow rings, and information on recoveries was through the Moscow Ringing Centre. Some data collected by this organisation have been prepared in earlier publications (IL'ICHEV 1982, MIHELSONS & HARASZTHY 1985, LEBEDEVA & SHEVYREVA 1960, LINDEMAN 1976). In the 1990's the Institute of Zoology began also to use some Kazakhstan rings, and recoveries from these rings are sent directly to the Institute.

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3. Results

We have data on 10,878 diurnal raptors of 31 species and 1,055 owls of 8 species ringed in Kazakhstan between 1966 and 1999. The vast majority of these (7,414 representing 29 diurnal and 5 nocturnal species) were caught at Chokpak between 1966 and 1999. In addition, 4,519 raptors were ringed at other locations in Kazakhstan. 16 of the 39 total species studied were ringed in rather small number (less than 50 each, 215 specimens together) and we have no recoveries from these species.

Between 1939 and 1999, the Institute of Zoology received information on recoveries of 165 raptors of 23 species, 2 of which are owls (Table). Of the 149 recoveries of birds ringed inside Kazakhstan, 71 (48%) are from Kazakhstan. 43 of these 71 were recoveries from less than 100 km of the place of ringing. The 78 recoveries from outside Kazakhstan were from 22 countries throughout the former USSR, Africa, Europe and Asia.

Ring recoveries can be divided into two main groups – those from breeding grounds and those from wintering grounds or on migration. Breeding recoveries from Siberia and Russian Altai are available with the following maximum distances between banding site and the places of recovery: Black Kite (*Milvus migrans*) – 1950 km, Goshawk (*Accipiter gentilis*) – 670 km, Sparrowhawk (*Accipiter nisus*) – 1800 km, Hen Harrier (*Circus cyaneus*) – 1400 km, Montagu's Harrier (*Circus pygargus*) – 1580 km, Pallid Harrier – 1600 km, Merlin (*Falco columbarius*) – 1440 km, Kestrel – 1870 km, Long-eared Owl (*Asio otus*) – 1890 km. Most of these birds were ringed at Chokpak.

Recoveries from wintering places and migration routes are concentrated in several regions: Russia (south European region) – 16, Caucasus – 16, Middle East and Mediterranean states – 7, Central Asia – 13, Africa – 12, Europe – 3. Two of these last three represent the only cases of migration in a pure westerly direction – one Steppe Eagle which flew to Byelorussia (1300 km) and a Kestrel which flew to the Ukraine (2000 km).

Only two recoveries are known from Asia south or east of Kazakhstan. The first, an unidentified Harrier (*C. macrourus* or *C. pygargus*) ringed in at Bharatpur in India was found three years later 3210 km away in northern Kazakhstan (IL'ICHEV 1982). The second, a Saker ringed at East Kazakhstan in 1994, was found in China near the Kazakhstan border (KENWARD et al. 1995).

All the recoveries of Steppe Eagle and Red-footed Falcon are from birds ringed in Western Kazakhstan and later recovered from locations west of the Caspian Sea. However, recoveries of Black Kite, Pallid Harrier, Sparrowhawk, Long-legged Buzzard, Long-eared Owl, Kestrel and Saker falcon are from birds ringed in west and east Kazakhstan and indicate that these birds may follow one

Table: Recoveries of birds of prey and owls in Kazakhstan in 1939-1999. – Wiederfunde von Greifvögeln und Eulen in Kazakhstan von 1939–1999.

| Species | Number of ringed in Kazakhstan in 1966–1999 | | Number of recoveries | | Where the recovered birds are ringed | | Foreign countries and regions (number of recoveries)* | Maximum distance, km |
|---------------------|---|----------|----------------------|----------------------------|--------------------------------------|--------|---|----------------------|
| | Chokpak | In total | In total | In the region where ringed | Kazakhstan | abroad | | |
| Honey Buzzard | 55 | 55 | 1 | 1 | 1 | - | - | 5 |
| Black Kite | 387 | 464 | 8 | 2 | 8 | - | Alt, Geor, Ru, Sib | 1950 |
| Hen Harrier | 167 | 180 | 2 | - | 1 | 1 | Kir, Sib | 1402 |
| Pallid Harrier | 278 | 321 | 11 | - | 6 | 5 | Fr, Ind, Sib(3), Tun(3), Uzb | 4550 |
| Montagu's Harrier | 397 | 811 | 15 | 10 | 15 | - | Sib | 1580 |
| Marsh Harrier | 48 | 153 | 1 | 1 | 1 | - | - | 0 |
| Goshawk | 27 | 33 | 2 | - | 1 | 1 | Sib, Geor | 928 |
| Sparrowhawk | 3067 | 3307 | 29 | 3 | 28 | 1 | Alt(3), NCau(2), Sib(7), Tu, Uzb(5) | 1800 |
| Shikra | 113 | 122 | 1 | - | 1 | - | - | 283 |
| Upland Buzzard | 3 | 70 | 1 | - | 1 | - | Kir | 300 |
| Long-legged Buzzard | 107 | 294 | 12 | 2 | 12 | - | Ru(6), Syr, Turk(2), Uzb | 1885 |
| Common Buzzard | 452 | 461 | 11 | - | 3 | 8 | Arm, Isr, Uzb, Za, SAF(7) | 11560 |
| Steppe Eagle | 29 | 112 | 9 | - | 9 | - | Az, Byel, NCau(4), Ru(2) | 1300 |
| Imperial Eagle | 3 | 114 | 1 | 1 | 1 | - | - | 70 |
| White-tailed Eagle | - | 23 | 2 | 1 | 2 | - | - | 200 |
| Saker Falcon | 14 | 526 | 12 | 5 | 12 | - | Geor, Ch, Pak | 2040 |
| Hobby | 479 | 599 | 4 | 3 | 4 | - | - | 1500 |
| Merlin | 95 | 154 | 4 | - | 4 | - | Alt, NCau, Sib, Uzb | 2310 |
| Red-footed Falcon | - | 515 | 4 | 1 | 4 | - | Leb, Ru(2) | 2700 |
| Lesser Kestrel | 460 | 685 | 6 | 4 | 6 | - | Geor, SAF | 8547 |
| Kestrel | 572 | 1778 | 16 | 2 | 16 | - | Gr, Leb, NCau(2), Ru(5), Sib, Ukr, Uzb | 2575 |
| Long-eared Owl | 365 | 569 | 10 | 4 | 10 | - | NCau, Sib, Taj, Tu | 1890 |
| Scops Owl | 212 | 372 | 3 | 3 | 3 | - | - | 1 |
| In total | 7330 | 11718 | 165 | 43 | 149 | 16 | | |

* **Alt** – Russian Altai; **Arm** – Armenia; **Az** – Azerbaijan; **Byel** – Byelorussia; **Ch** – China; **Fr** – France; **Geor** – Georgia; **Gr** – Greece; **Ind** – India; **Isr** – Israel; **Kir** – Kirgizia; **Leb** – Lebanon; **NCau** – Northern Caucasus (Russia: Dagestan, Checheno-Ingushetiya etc.); **Pak** – Pakistan; **Ru** – South of European part of Russia; **Sib** – West Siberia (Tomsk, Omsk, Kemerovo, Novosibirsk, Krasnoyarsk regions); **SAF** – South Africa; **Syr** – Syria; **Taj** – Tajikistan; **Tun** – Tunisia; **Tu** – Turkmenistan; **Turk** – Turkey; **Ukr** – Ukraine; **Uzb** – Uzbekistan; **Za** – Zaire

of two migration routes. The first route is suggested by recoveries from birds ringed in Western and Northern (Naurzum National Nature Reserve) Kazakhstan, which were recovered to the west of the Caspian Sea in the south European parts of Russia, Caucasus and Turkey. Individuals of the same species from the Altai mountains, Western Siberia, and Eastern, Central and Southern Kazakhstan were found in central Asia, and recorded on migrations through Chokpak pass, suggesting the second route for these species. However, only one bird, a young Sparrowhawk banded north of the Caspian Sea in October 1974, was later found in the immediate region east of the Caspian (In Turkmenistan in March 1975, 460 km south-east of where it was ringed).

Several records of ringed nestling raptors are worth noting. Rings from three Long-legged Buzzard and one Saker from semi-desert zones were recovered from 195 to 560 km north of their nests. A Pallid Harrier ringed at the Naurzum National Natural Reserve in northern Kazakhstan in 1946 was found in the Novosibirsk region of Russia (900 km east) 6 years later. A Black Kite and a Steppe Eagle both from Western Kazakhstan were found to the south-west of their birthplaces in July of the following year. The Kite moved 880 km to Georgia and the Steppe Eagle 1090 km to Azerbaijan. The recoveries suggest that these particular species may show wide ranging patterns of juvenile dispersal.

The interval between ringing and recovery for all the species was less than one year in 44.8% of cases. 30.9% of returns were between 1 and 3 years after ringing, 10.9% were from 3 to 5, 7.9% from 5 to 7, 3.6% from 7 to 9, one case (0.6%) from 10 years and two cases (1.2%) from 15–16 years after ringing. The longest intervals between ringing and recovery recorded for Black Kite and Steppe Eagle was 15 years, for Pallid Harrier 9 years, for Montagu's Harrier 8 years, for Sparrowhawk, Kestrel, and Long-eared Owl 7 years, for Saker and Lesser Kestrel (*Falco naumanni*) 6 years, and for Common Buzzard and Merlin 5 years. The return period for all other species was less than five years.

In a few cases of very short periods between ringing and recovery, these data can be used to gain some idea of the speed of migrations. In particular, during the spring (northbound) flight through Chokpak pass, one Sparrowhawk ringed there travelled at least 1365 km in the 10 days before its ring was recovered (136.5 km/day), and another at least 1440 km in 23 days (62.6 km/day).

4. Discussion

Ring recoveries suggest that raptors migrating from Kazakhstan in autumn can be divided into three groups based on the distances to which they travel to wintering grounds. Common Buzzard, Lesser Kestrel, and Pallid Harrier travel the greatest distances and winter in South Africa, Zaire, Tunisia, France, and India (here only Pallid Harriers). Medium range migrants include the Red-footed Falcon, Kestrel, and Long-legged Buzzard, and returns of these species are from Syria, Lebanon, Turkey, and Greece. Published literature suggests that Red-footed Falcons may travel even further, going as far as Tunisia (IL'ICHEV 1982) and South Africa (DEMENT'EV 1951). The migrants that travel the shortest distances include Black Kite, Hen Harrier, Goshawk, Sparrowhawk, Steppe Eagle, Upland Buzzard (*Buteo hemilasius*), Saker, Merlin, and Long-eared Owl. Returns of these species are primarily from the Caucasus, and central Asia, including Pakistan. Other observations also suggest that the distance that most of these species migrate is dependent on the regional and annual environment, and they sometimes winter in the southern part of Kazakhstan (KORELOV 1962). The recoveries of Black Kite and Steppe Eagle are from April and September–November, and therefore represent migrating rather than wintering birds. Steppe Eagles flying to west from Caspian Sea obviously travel further south than our records indicate, as this species is not observed at Northern Caucasus in winter (IL'ICHEV 1982). Similarly, Black Kite from Kazakhstan are known to winter in central Asia and Africa (*M. m. korschun*), and in India (*M. m. lineatus*; DEMENT'EV 1951).

The relationship between the maximum distance that a species migrates and the probability of its presence in Kazakhstan in winter is not so precise. Certainly the three longest distance migrants – Pallid Harrier, Lesser Kestrel and Red-footed Falcon – are completely absent from central Asia in winter. However, some of the medium and short distance migrants may winter in Kazakhstan, and others never do. Hobby (*Falco subbuteo*), Black Kite, Steppe Eagle have never been observed here

in winter. However, Common Kestrels which breed in Kazakhstan regularly, winter in South and Southeast portions of the country (KORELOV 1962; our data) as well as in Greece, Lebanon, and Tunisia (IL'ICHEV 1982). Similarly, while Saker falcons from South and Southeast Kazakhstan are year-round residents, Sakers from other parts of the country make either local movements in winter, or may travel as far as Turkey, Saudi Arabia, Yemen and Iraq (KENWARD et al. 1995, 1998). Common Buzzard, the longest distance migrant – represented by two subspecies – are observed in Kazakhstan: *B. b. vulpinus* („Steppe Buzzard“ in some English sources) which breeds here and migrates to Africa, and *B. b. japonicus* which breeds in eastern Siberia and winters in India, China, Middle Asia, and sometimes southern Kazakhstan (DEMENT'EV 1951, KORELOV 1962, STEPANYAN 1990).

Birds of prey generally migrate through Kazakhstan from the south-west to the north-east in the spring, and from the north-east to the south-west in the autumn (GAVRILOV 1979). Some species which breed in northwest Kazakhstan, (e.g. Black Kite, Pallid Harrier, Sparrowhawk, Long-legged Buzzard, Saker, Kestrel, and Long-eared Owl), migrate west and south around the Caspian Sea on route from breeding to wintering grounds. Alternatively, individuals of those same species from other parts of Kazakhstan fly other routes directly through South Kazakhstan and Central Asia. The border between the populations which migrate by these different routes is unknown, but is most likely somewhere between 60° and 65° longitude, taking into consideration not numerous ringing data.

While we only have recoveries of birds banded in western Kazakhstan, we assume that the border between those populations of Steppe Eagles which migrate around the Caspian and those populations which fly further east is also between 60° and 65° longitude. Steppe Eagles, which both breed and migrate through southern and eastern Kazakhstan, have been expanding their breeding range in recent years (SKLYARENKO et al. 1999). The border which divides populations of Steppe Eagle inhabit Kazakhstan: *A. nipalensis orientalis* in the west and *A. n. nipalensis* in the east. However, the location of a border or zone of introgression between these two subspecies is not at all clear. Recoveries of *A. n. orientalis* banded in western Kazakhstan suggest that some members of this race fly around the Caspian Sea, while others have been captured migrating through Chokpak with *A. n. nipalensis*. Several species, including Common Buzzard and Lesser Kestrel, do not show consistent relationships between ringing and recovery sites. In fact, our data suggest that birds which breed in many different regions probably winter together and may change the route they migrate depending on a variety of factors. While we have seen similar trends in Red-footed Falcons, our returns are all from birds from West Kazakhstan, and this therefore limits our ability to make inference about the rest of the population (KORELOV 1962, MEKLENBURTZEV et al. 1987).

Finally, it is important to comment on some trends in the annual number of ringing recoveries as they pertain to raptor conservation. Many of our records were in the 1960's, when birds of prey in the USSR were purposefully persecuted because they were perceived to compete with hunters. The Pallid Harriers and Common Buzzards ringed in Southern Africa and France were killed during these programs in Kazakhstan. However, in more recent years the majority of recoveries are strictly from the Chokpak ringing station. Despite active banding, ring returns by local people throughout the former Soviet Union has practically stopped in the past 10 years. We attribute this to the difficult economic situation in the region, which has turned peoples attention away from conservation of resources and towards basic survival. We hope that as the economic situation improves in these regions, that the number of ringing returns will increase to its former level.

5. Zusammenfassung

Zugrouten von Greifvögeln und Eulen in Kazakhstan anhand von Ringfunden.

Das Zoologische Institut in Kazakhstan erhielt zwischen 1939 und 1999 insgesamt 165 Wiederfundmeldungen, die Vögel von 21 Greifvogel- und 2 Eulenarten betreffen. 71 dieser Meldungen stammen von Vögeln, die in Ka-

zakhstan sowohl beringt als auch zurückgemeldet wurden, während die übrigen 94 Wiederfunde Vögel betreffen, die in einem von 22 anderen Ländern entweder beringt oder wiedergefunden worden waren. Rückmeldungen von Vögeln der Arten Mäusebussard, Rötelfalke und Steppenweihe aus Südafrika, Zaire, Tunesien und Frankreich lassen vermuten, dass diese Arten die weitesten Zugwege zurücklegen. Die Wiederfunde von Vögeln der Arten Rotfußfalke, Turmfalke und Adlerbussard stammten jeweils aus dem Mittleren Osten (Syrien, Libanon, Türkei, Griechenland). Dagegen wurden Vögel der Arten Schwarzmilan, Kornweihe, Habicht, Sperber, Steppenadler, Mongolen-Bussard, Würgfalke, Merlin und Waldohreule aus dem Kaukasus, Zentral-Asien und Pakistan zurückgemeldet. Über Kazakhstan ziehen vor allem die nördlichen Populationen vieler Greifvögel, so dass auch Wiederfunde von sibirischen Vögeln der Arten Schwarzmilan, Habicht, Sperber, Korn-, Wiesen- und Steppenweihe, Merlin, Turmfalke und Waldohreule vorliegen. Nur 2 Wiederfunde (Würgfalke, Steppenweihe) stammen aus dem asiatischen Bereich südlich oder östlich von Kazakhstan. Nach diesen Daten lässt sich vermuten, dass der Zug durch Kazakhstan im Frühjahr vor allem in nördlicher und östlicher Richtung verläuft und im Herbst in südlicher und westlicher Richtung. Vögel aus dem Nordwesten Kazakhstans der Arten Schwarzmilan, Steppenweihe, Sperber, Adlerbussard, Würgfalke, Turmfalke und Waldohreule ziehen östlich des Kaspischen Meeres, während die Zugroute der Vögel anderer Regionen durch Südost-Kazakhstan und Mittelasien verläuft. Die Beziehungen zwischen Zuglänge der Arten und der Wahrscheinlichkeit ihres Auftretens in Kazakhstan während des Winters werden diskutiert.

6. References

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