

### Summary

#### Population development of Firecrest (*Regulus ignicapillus*) and Goldcrest (*Regulus regulus*) in the Harz mountains.

In a study area of 49,3 ha in the Harz Mountains (Sachsen-Anhalt) Firecrests significantly increased between 1993 and 2002 whereas the breeding stock of Goldcrests showed considerable fluctuations during the same period, and an intense population crash in 2002. This is possibly due to changes in the availability of specific food resources used by Goldcrests. A female Goldcrest was controlled for three breeding seasons.

### Literatur

- Barthel, P. H. (2002): Bemerkenswerte Beobachtungen Oktober und November 2002. Limicola 16: 333–344.  
 \* Bauer, H. G., & P. Berthold (1996): Die Brutvögel Mitteleuropas. Bestand und Gefährdung. Wiesbaden.  
 \* Dornbusch, M., G. Grün, H. König & B. Stephan (1968): Zur Methode der Ermittlung von Brutvogel-Siedlungsdichten auf Kontrollflächen. Mitt. IG Avifauna DDR 1: 7–16. \* Flade, M. (1998): Neue Prioritäten im deutschen Vogelschutz: Kleiber oder Wiedehopf? Falke 45: 348–355. \* Flade, M., & J. Schwarz (2002): Gewinner und Verlierer: Die Bestandsentwicklung von Waldvögeln in Deutschland im ausgehenden 20. Jahrhundert. Vortrag auf der 135. Jahrestagung der DO-G am 26. September 2002 in Münster. \* Gatter, W. (2000): Vogelzug und Vogelbestände in Mitteleuropa. 30 Jahre Beobachtung des Tagzugs am Ranndecker Maar. Wiebelsheim. \* George, K. (1998): Mehrjährige Studien an der Blaumeise *Parus caeruleus* im Unterharz. Orn. Jber. Mus. Heineanum 16: 53–64. \* Ders. (1999 a): Zur Bestandsentwicklung des Zilpzalps *Phylloscopus collybita* in zwei Untersuchungsgebieten Ostdeutschlands in den 90er Jahren. Orn. Mitt. 51: 338–342. \* Ders. (1999 b): Mehrjährige Studien am Buchfink *Fringilla coelebs* im Unterharz. Ber. Vogelw. Hiddensee 15: 53–64. \* Ders. (2000): Zum Vorkommen des Erlenzeigs *Carduelis spinus* im Unterharz. Orn. Jber. Mus. Heineanum 18: 83–92. \* Glutz von Blotzheim, U. N., & K. M. Bauer (Bearb., 1991): *Regulus regulus* (Linnaeus 1758) – Wintergoldhähnchen, *Regulus ignicapillus* (Temminck 1820) – Sommerringgoldhähnchen. Handbuch der Vögel Mitteleuropas. Band 12/II: 1360–1446. \* Haensel, J., & H. König (1974–1991): Die Vögel des Nordharzes und seines Vorlandes. Naturkdl. Jber. Mus. Heineanum IX. Halberstadt. \* Marchant, J. (1997): Firecrest *Regulus ignicapillus*. In: E. J. M. Hagemeijer & M. J. Blair (Hrsg.): The EBCC Atlas of European Breeding Birds: Their Distribution and Abundance. London. \* Rönn, J. v. (2001): Zug- und Rastvögel der Greifswalder Oie. Seevögel 22, SH 1: 58–107. \* Schildmacher, H. (1982): Einführung in die Ornithologie. Jena. \* Staav, R. (1998): Longevity list of birds ringed in Europe. EURING Newsletter 2: 2–17. \* Thaler-Kottke, E. (1990): Die Goldhähnchen: Winter- und Sommerringgoldhähnchen, *Regulus regulus*, *Regulus ignicapillus*. Neue Brehm-Bücherei 597. Wittenberg Lutherstadt. \* Thaler, E., & K. Thaler (1982): Nahrung und ernährungsbiologische Unterschiede von Winter- und Sommerringgoldhähnchen (*Regulus regulus*, *R. ignicapillus*). Ökol. Vögel 4: 191–204.

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### Behaviour of mallard x red-crested pochard hybrids (*Anas platyrhynchos* x *Netta rufina*) in late winter/early spring

Previously, behaviour of wildfowl hybrids was studied with regard to evolutionary and taxonomic aspects (LIND & POULSEN 1963, LORENZ 1941, SCHERER & HILSBERG 1982, SHARPE & JOHNSGARD 1966), but quantitative behavioural research and time-activity budgets on wild living hybrids have not been carried out until recently, although information about that would enable to assess viability and survivorship of hybrids. This paper addresses the question whether wild living hybrid ducks differ in time budgets and feeding behaviour from both parent species, *Anas platyrhynchos* and *Netta*

*rufina*. Further, it reports some data on the behaviour of red-crested pochard, a species rarely examined. One would expect hybrids to behave intermediate between both parent species or closely resembling one of them.

### Methods

Two almost indistinguishable male hybrids were observed near Lauffen at the Neckar, SW Germany ( $9^{\circ}09' E$   $49^{\circ}06' N$ ). An observation design was constructed using instantaneous focal animal sampling (ALTMANN 1974, MARTIN & BATESON 1993) under consideration of SOMMER & SOMMER (1997) to hold all but one variable constant. STILL (1982) gave some useful information about research when the number of subjects is restricted, e.g. to better control extraneous variables and to improve experimental design. This study compares unpaired hybrid males with unpaired mallard drakes at the same time and place simultaneously, so the only variable were the subjects, all others were held constant.

The hybrid and the male mallard nearest to it were sampled simultaneously (haphazard sampling, LEHNER 1996). Additionally some 10-minute-sample-sessions were taken focusing on one individual only and shifting between hybrid and mallard. Data of both methods were pooled. In each session the individual used for sampling was chosen at random. I used 10 s intervals (see PÖYÄ 1991) in both methods to record the following main categories (adapted from PIETZ & BUHL 1999): feeding (dip: feeding at the water surface; dunk: immersing head or head and neck; tip up: immersing upper body; feeding at land; feeding on bread or other supplementary food), resting (sitting on water or land, standing on land, – with or without head tucked or neck contracted), locomotion (walking, swimming, flying), comfort behaviour (bathing, preening, stretching, flapping) and others (alert, courtship, social interaction).

Only unpaired drake mallards were used for comparison, because the hybrids were unpaired themselves, and mated males have different time budgets in summer (PIETZ & BUHL 1999), but did not show much difference in winter (e.g. JORDE cit. in PAULUS 1988). Agonistic behaviour directed towards and initiated by the hybrids was registered separately (behaviour sampling, MARTIN & BATESON 1993). Observations were made in late winter and early spring on 13 days between 20 March and 4 May 2001 and on 2 days in 2002 (28 February 2002, 13 March 2002) comprising a total of 7.16 h in Mallard and 7.78 h in the hybrids. Observations lasted much longer, e.g. due to the need for locating the hybrids. The hybrids were identified by plumage using GILLHAM & GILLHAM (1996), HAURI (1995) and WATTEL & HARRISON (1968). A photograph of one individual and of other hybrids and variations of the same combination are published in a paper dealing with identification of dabbling duck hybrids (RANDLER 2001: 90–91). The habitat was typical for an urban mallard population comprising around 100 mallards with a biased sex ratio (70% males), which seems typical for urban mallard populations in SW Germany in winter: biased sex ratios with a surplus of males (62%, RANDLER 1994). Therefore enough unpaired males were available for comparison. The population remained stable throughout the period of sampling and no other wildfowl species were present. Unfortunately, no red-crested pochards were available at the study site for further comparison. Therefore I obtained sampling data of male red-crested pochards using the method outlined above from the study site Wagbachniederung near Karlsruhe (8.3.2002, 11.3.2002;  $8^{\circ}31' E$   $49^{\circ}16' N$ ;  $n = 8,4$ ). I scheduled these sessions to 10 minutes, repeated twice per hour (total: 2.34 h).

### Results

In detail, red-crested pochards spent more time feeding and a lesser amount of time in comfort behaviour than male mallards (see Table). No differences were found regarding locomotion, resting or courtship, agonistic and alert behaviour. The hybrids spent even more time feeding and less time resting than both parent species; the percentage of comfort behaviour was closer to mallard. The hybrids did not show any courtship display. A closer examination of the subcategory feeding (see Figure) reveals a higher amount of time spent surface feeding and diving and a lesser amount of time feeding with head immersed in red-crested pochard. The hybrids fed even more time at land than mallard, were closer to red-crested pochard in surface feeding and intermediate in feeding with head immersed. Tip up feeding was very rare in contrast to mallard and diving did not occur at all.

14 out of 17 encounters were initiated by the hybrids. This difference was significant (binomial test,  $p = 0.013$ ). In 13 cases the initiating hybrid was more likely to win the encounter (binomial test,

Table: Percentages of behaviour categories. Asterisks indicate a significant difference.

\* =  $p < 0.05$ , \*\* =  $p < 0.01$ .

Tab.: Prozentanteile der jeweiligen Verhaltenskategorien. Sternchen zeigen signifikante Differenzen.

\* =  $p < 0.05$ , \*\* =  $p < 0.01$ .

Main categories	hybrid Hybrid	mallard Stockente	red-crested pochard Kolbenente
Feeding/Nahrungsaufnahme	16.0 %	7.6 %*	10.7 %*
Resting/Ruhen	43.7 %	52 %	56.4 %
Locomotion/Fortbewegung	23.3 %	22.2 %	20.6 %
Comfort/Komfortverhalten	16.0 %	16.4 %**	11.1 %**
Alert/Aufmerken	0.8 %	1.3 %	0.5 %
Agonistic/Interaktionen	0.1 %	0.2 %	0.4 %
Courtship/Balz	—	0.1 %	0.4 %
Total No.obs.	2579	2801	845
	$\chi^2_6 = 28.025$		$p < 0.001$

$p = 0.002$ ) and in one case both participants draw back. Most encounters were directed to drakes (13 out of 14; binomial test,  $p = 0.002$ ). Three encounters were induced by drake mallards, with each of which being successful. In general, the hybrid was more likely to win an encounter ( $n = 13$ ) than to draw (1) or loose (3).

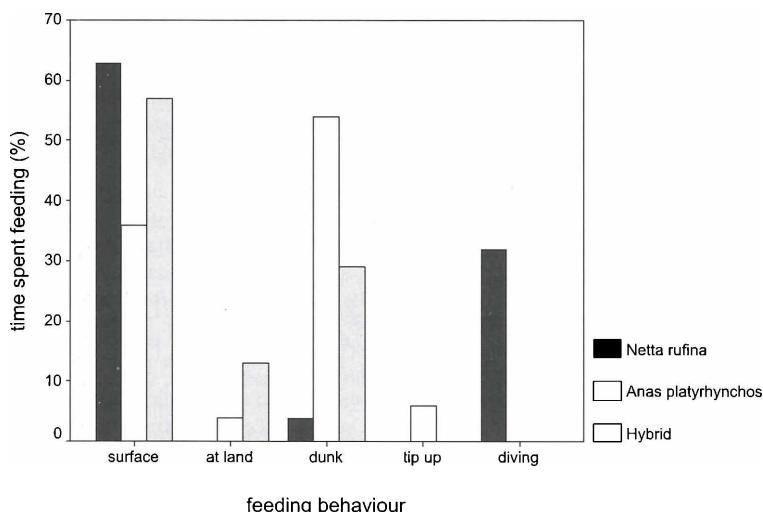


Fig. 1: Feeding behaviour. – Nahrungsverhalten in Prozent. Surface: an der Wasseroberfläche, at land: an Land, dunk: Kopf eingetaucht, tip up: gründeln, diving: tauchen.

## Discussion

The hybrids showed a high plasticity in their time budgets with some behaviour closer to red-crested pochard and other closer to mallard. The time spent feeding exceeded both parent species and was compensated by a lesser amount of time resting. Although my study did not cover the complete pe-

riod of daytime activity (but observations were equally distributed between 8.00 and 16.00 hrs), time budgets of mallard show almost similar results compared to other studies, but with less time spent feeding (BALDASSARRE & BOLEN 1994, PIETZ & BUHL 1999). This may be influenced by the urban environment and supplementary feeding (FIGLEY & VANDRUFF 1982), because in Lauffen ducks are fed by passer-bys. Further, ducks foraging in natural environments spend more time feeding compared to agricultural environments. Further, the time spent surface, dunk and tip-up feeding was „hybrid“ between both species.

Social interactions showed that the hybrids are not inferior to mallards, but they did not perform any courtship display during observation and fitness therefore may be restricted. A reduced incidence of display was also apparent in F<sub>2</sub>-hybrids between mallard and pintail *Anas acuta*, despite these birds appeared to be in good physical condition (SHARPE & JOHNSGARD 1966). Despite these facts, successful backcrossing of hybrid ducks with their parental species has been reported (e. g. SCHERER & HILSBERG 1982). SANCHEZ et al. (2000) investigated *Oxyura* species in Spain and found no significant differences in diet and feeding behaviour between *O. jamaicensis*, *O. leucocephala* and their hybrids. The compatibility of feeding behaviour of the parent species might account for the high rate of hybridisation and the high viability of wildfowl hybrids.

### Zusammenfassung

#### Verhalten von Hybriden zwischen Stock- und Kolbenente (*Anas platyrhynchos* × *Netta rufina*) im Spätwinter/Frühjahr.

Die beiden Hybriden verbrachten mehr Zeitanteile mit der Nahrungsaufnahme und weniger Anteile mit Ruhen und agonistischen Interaktionen als die Elternarten. Bezuglich des Komfortverhaltens glichen die Budgets jenen der Stockente. Balzverhalten zeigten die Hybriden nicht (Tab. 1). Im Hinblick auf die Nahrungsaufnahme (Abb. 1) verbrachten die Hybriden mehr Zeit an Land als die Elternarten, waren intermediär bezüglich des Fres-sens an der Wasseroberfläche und mit eingetauchtem Kopf, sowie des Gründelns. Tauchverhalten zeigten die Hybriden nicht. Bezuglich aggressiver Interaktionen zeigten sich die Hybriden männlichen Stockenten gegenüber überlegen. Die Beobachtungen geben einen Hinweis darauf, dass Entenhybriden trotz teilweise intermediär ausgeprägten Verhaltens gut an die Umweltbedingungen angepasst und überlebensfähig sind.

### References

- Altmann, J. (1974): Observational study of behaviour: sampling methods. Behaviour 49: 227–267. \* Baldassarre, G. A., & E. G. Bolen (1994): Waterfowl ecology and management. Wiley & Sons, New York.  
 \* Bauer, K. M., & U. N. Glutz von Blotzheim (1969): Handbuch der Vögel Mitteleuropas. Band 3, Anseriformes 2. Teil. Akad. Verlagsges., Frankfurt/Main. \* Boutin, J. (1986): Compartement diurne de la Nette rousse, *Netta rufina* P., pendant son hivernage en Camargue. Rev. Ecol (Terre Vie) 41: 261–269. \* Figley, W. K., & L. W. VanDruff (1982): The ecology of urban mallard. Wildl. Monogr. 81: 1–39. \* Gillham, E., & B. Gillham (1996): Hybrid ducks. A contribution towards an inventory. Published by the authors, Lydd on Sea, Kent. \* Hauri, R. (1995): Bastarde der Kolbenente *Netta rufina* und der Stockente *Anas platyrhynchos* am Thunersee. Ornithol. Beob. 92: 481–482. \* Lehner, P. (1996): Handbook of ethological methods. Cambridge University Press, Cambridge. \* Lind, H., & H. Poulsen (1963): On the morphology and behaviour of a hybrid between Goosander and Shelduck (*Mergus merganser* L. x *Tadorna tadorna* L.). Z. Tierpsych. 20: 558–569. \* Lorenz, K. (1941): Vergleichende Bewegungsstudien an Anatinen. J. Ornithol. 89, Sonderband: 194–293. \* Martin, P., & P. Bateson (1993): Measuring Behaviour. An introductory guide. Cambridge University Press, Cambridge. \* Paulus, S. L. (1988): Time-activity budgets of nonbreeding Anatidae: a review. Pp 135–152 in Weller, M. W. (ed). Waterfowl in winter. University of Minnesota press, Minneapolis. \* Pietz, P. J., & D. A. Buhl (1999): Behaviour patterns of mallard *Anas platyrhynchos* pairs and broods in Minnesota and North Dakota. Wildfowl 50: 101–122. \* Pöysä, H. (1991): Measuring time budgets with instantaneous sampling: a cautionary note. Anim. Behav. 42: 317–318. \* Randler, C. (1994): Hybrid-einfluss von Hausenten und Zuchtformen bei semi-domestizierten Stockenten (*Anas platyrhynchos*) – eine Studie aus dem Großraum Stuttgart. Ornithol. Anz. 33: 31–35. \* Idem (2001): Field identification of hybrid wildfowl – Dabbling Duck. Alula 7: 82–91. \* Sanchez, M. I., A. J. Green & J. C. Dolz (2000): The

diets of the White-headed Duck *Oxyura leucocephala*, Ruddy Duck *O. jamaicensis* and their hybrids from Spain. Bird Study 47: 275–284. \* Scherer, S., & T. Hilsberg (1982): Hybridisierung und Verwandtschaftsgrade innerhalb der Anatidae – eine systematische und evolutionstheoretische Betrachtung. J. Ornithol. 123: 357–380. \* Sharpe, R. S., & P. A. Johnsgard (1966): Inheritance of behavioural characters in F<sub>2</sub> mallard x pintail (*Anas platyrhynchos* L. x *Anas acuta*) hybrids. Behaviour 27: 259–272. \* Sommer, B., & R. Sommer (1997): A practical guide to behavioral research. Tools and techniques. Oxford University Press, New York. \* Still, A. W. (1982): On the number of subjects used in animal behaviour experiments. Anim. Behav. 30: 873–880. \* Wattel, J., & J. M. Harrison (1968): Some hybrid ducks in the collection of the Zoölogisch Museum, Universiteit van Amsterdam. Beaufortia 15: 209–220.

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## Body mass and fat scores of Palaearctic migrants at the southern fringe of the Sahara desert in autumn

Migrants in the Western Palaearctic-African migration system have to pass two to three major ecological barriers to reach their winter quarters in tropical Africa. These are 1) the Alps for some of the migrants breeding in northern and central Europe 2) the Mediterranean Sea and 3) the Sahara desert. The strategies migrants use to pass the first two obstacles were summarised by BRUDERER & JENNI (1990) and BRUDERER & LIECHTI (1999). However, the strategies that migrants may use to cope with the largest barrier, the Sahara desert, remain controversial (BIEBACH 1995). Conflicting theories are whether migrants cross the Mediterranean Sea and the Sahara in a non-stop flight, stop regularly during daytime in the Sahara, or use individual strategies depending on internal state (fat reserves, dehydration) or external conditions (availability of shade) (MOREAU 1972, BAIRLEIN 1985, 1992, BIEBACH et al. 1986, 2000, Wood 1989).

Essential for the understanding of migration strategies and for the development of optimal migration models are field data on the physical condition of migrants collected along their migration route. This has been achieved during the course of the European-African Songbird Migration Network between 1994 and 1996 (BAIRLEIN 1998, SCHABU & JENNI 2000, 2001) but the available data are mainly from locations north of the Sahara or from the tropical savannas (SMITH 1966, FRY et al. 1970, DOWSETT & FRY 1971, LOSKE 1990, SALEWSKI et al. in press). Few data on body mass and fat scores of migrants are available from earlier studies from oases in the desert (BAIRLEIN 1985, 1992, BIEBACH et al. 1986). There seem to be no data available on the physical condition of migrants from the southern fringe of the Sahara just after the desert crossing. These data would be essential for the assessment of optimal migration strategies because only data collected just behind a barrier can reveal its importance with respect to the amount of energy needed to pass this barrier. Here we present data on mass and fat scores of Palaearctic migrants which we caught over three days in September 2001 in the oasis of Tichit, Mauritania, at the southern fringe of the Sahara desert.

### Methods

During a pilot study of the Swiss Ornithological Institute in Mauritania we stayed in the oasis of Tichit (18°26'N, 09°03'W) from 13 September to 15 September 2001. The Sahara desert extends for about 1200 km to the north and only about 150 km to the south, a relatively short distance for migrating birds in good condition. The oasis is surrounded by Date Palm (*Phoenix dactylifera*) plantations. At its western fringe, a small forest (60 x 300 m) of the introduced Mesquite (*Prosopis juliflora*) was planted to protect the oasis from approaching sand dunes.

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