U.C.R. Editor: the text of Dr. Lindberg's complete manuscript follows this 'abstract' and 'introduction'. This 'abstract' and 'introduction' are in draft form. New data supports revisions, currently underway. Dr. Lindberg advanced his observations, long before joining U.C.R.'s Science Advisory Board. Dr. Lindberg shall publish the complete document and data in a leading ornithology journal.

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Lost falconers birds and hybrid falcons - do they have an impact on European Peregrine Falcon (*Falco peregrinus*) populations ? – a case study of lost falconers birds breeding in Sweden

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Abstract

In 1998 a female Peregrine Falcon (*Falco peregrinus*) with anklets was found breeding in Bohuslän in SW Sweden. The only nestling was ringed and blood-samples taken. The young disappeared at fledgling, probably taken by an Eagle-Owl (*Bubo bubo*). The blood-sample was used for DNA-analysis by a PCR-technique and revealed that the nestling was not a pure bred peregrine but had foreign genes consistent with the Gyrfalcon (*Falco rusticolus*).
In spring 1999 the falcon pair returned to the territory and started breeding. The female was trapped on the nest and her two newly hatched chicks were collected. The male was unusually dark, as large as the female and carried a falconers ring on the right leg. We were unable to trap him. DNA-analyses of the female and the chicks showed that it was the same adult birds as in 1998 and that the male was the hybrid.
The female carried a ring and her origin could be traced. She was born in captivity at Själland, Denmark in 1995. She was a mixture of two subspecies , *F.p.peregrinus* and *F.p.pealei* and was fostered by her original parents. At an age of 8-9 weeks she was taken out the cage for falconry training but was lost in the beginning of September 1995. Both birds probably first arrived to the breeding site in spring 1998.
We propose that Peregrine x Gyrfalcon hybrids may interfere with wild peregrines in three ways 1) they may expel native peregrines for breeding territory, 2) disturb peregrines at nesting 3) mate with wild peregrines. If hybrid males expel wild peregrine males for territories and females there will be a selection that favours hybrid genes. With the increasing production of hybrids between different falcon species and a similar increased loss of falconers birds we can expect more observations of unwanted pairings between wild peregrines and hybrids and a similar spread of hybrid genes in nature.

Keywords: Peregrine Falcon (Falco peregrinus), hybrids, falconry, foreign genes, DNA microsatellite markers, recovery programme, non-native organism

Introduction

With the use of different subspecies of Peregrines and hybrids in falconry and captive breeding programmes in Europe, there is a concern for the transformation of foreign genes to

the indigenous peregrine populations in Europe. The use of hybrids has been seen with alarm by nature conservation organisations and the legal, environmental and moral aspects have also been discussed among the falconers organisations (anon. 1999). Although falconry is a very ancient hunting form and sport in Europe that have been practised for several millenniums there are relatively few published data on the occurrence of lost or released falconers birds breeding in the wild (Fischer 1967). With the increasing demand and production of hybrid falcons during the last 20 years the risk for unwanted gene combinations to be spread in nature has increased considerably (Heidenreich 1997, Rockenbauch 1998).

Falconry as a hunting form is prohibited in Norway, Sweden, Finland and Denmark but legal in most other countries. Only in the United Kingdom there are possibly 13 000 raptor keepers with between 16 000 to 18 000 birds of prey kept by them (Hawkins-Pinchers 1997). The number of registered falcons in 2000 (excluding common species such as the Kestrel (*Falco tinnunculus*) was 3758 of which 35% were hybrids (pers. comm. N.P.Williams, DETR Wildlife Inspectorate, Bristol). In the period 1994-1999 the number of reported bred hybrids of mainly large falcons in the UK was 2010. In continental Europe numbers of active falconers are estimated to 2500-3000 (Bolton 1997). Several hundreds, if not thousands of birds of prey of different species and subspecies are lost and released each year in Europe and many of those birds do accustom to a wild life and may hybridise with wild birds. Bolton (1997) gives some statistics for Great Britain: between January 1991-March 1992, 184 falcons (mainly large falcons as peregrines and lanners (*Falco biarmicus*) excluding Kestrels) were declared as lost to the Department of the Environment. About 5% was hybrids. Since then these figures have increased considerably.

Proposals have been forwarded by both Nature Conservation Organisations and Falconers Societies in Germany that the hybrid production within EU should be banned. But the demand of falcon hybrids, especially in the Middle East, is so great that it seems almost impossible to regulate the production of hybrids. Hybrids between Peregrine x Saker (*Falco cherrug*), peregrines x gyrfalcon (*Falco rusticolus*) and Saker x Gyrfalcon seem to be most popular but all types of mixing within the genus *Falco* seem to be possible by artificial insemination (Boyd 1978, Heidenreich 1997, Parks and Hardaswick 1987).

Hybrids between Gyrfalcon and Peregrine have been shown to be fertile and, in 1995 a hybrid male (Peregrine x Gyrfalcon) was found breeding with a wild female Peregrine in Thuringen, Germany. The pair produced young (Saar 1997, Rockenbauch 1998, Kleinstäuber and Seeber in press), but the male hybrid was caught as well as the nestlings to avoid the spread of hybrid genes. We report on a similar incident when a pair of lost falconers birds bred in SW Sweden.
The Peregrine falcon was earlier almost extirpated in southern Fennoscandia (Lindberg et al. 1988) and in 1974 a captive-breeding programme was initiated. Restocking of peregrines started in 1982 (Lindberg 1988) and since then, the number of breeding pairs has increased both in SE Norway and SW Sweden. In this restocking-programme only birds of the native subspecies *F.p.peregrinus* have been used.

In SW Sweden, the Swedish Society for Nature Conservation have monitored all territory holding pairs since 1972 and all nestlings have been colour-ringed since 1978. We thus have a good control of the individuals in the breeding population.

U.C.R. Editor: The manuscript continues, with complete data disclosures.
Dr. Lindberg shall publish the complete document and data in a leading ornithology journal.