Finnish raptor censuses

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The paper briefly reviews the methods and results of the Finnish censuses of the White-tailed Eagle *Haliaeetus albicilla,* Golden Eagle *Aquila chrysaëtos,* Peregrine *Falco peregrinus,* Osprey *Pandion haliaëtus* and Kestrel *Falco tinnunculus.*

The world-wide crash of raptor populations has been one of the tragedies of our time. Nowadays, however, many countries have given legal protection to most birds of prey. Attempts have been made to protect their breeding habitats and to restrict the use of poisonous chemicals. It has also been realized that all attempts at rescue require regular raptor censuses.

Raptor censuses were started in Finland as early as in the late 1950s, being carried out mainly by bird-ringers or skilful amateur ornithologists. The following species are now under country-wide annual surveillance: The White-tailed Eagle *Haliaeetus albicilla,* Golden Eagle *Aquila chrysaëtos,* Peregrine *Falco peregrinus,* Osprey *Pandion haliaëtus* and Kestrel *Falco tinnunculus.* In addition, a thorough census has been made of the Marsh Harrier *Circus aeruginosus* population (HILDÉN & KALINAINEN 1966).

The aims of raptor censuses. During recent years Finnish raptor censuses have been carried out according to the following plan: All known nests are visited annually and efforts are made to find new, earlier unknown nests, e.g. by making enquiries among the local people. In this way an attempt is made to clarify: (1) the size of the annually breeding population, (2) the nesting success and factors affecting it, (3) habitat requirements (special attention is paid to the nesting site and the degree of human influence, and to the characters of the nesting tree) (4) the timing of nesting (determined by direct observation and/or estimated from the wing-length of the nestlings. During the visits of inspection, the nestlings are ringed and some of them are colour-ringed, as well. This will later provide information on points (5) to (8)), (5) the mortality, causes of death and geographical distribution of the birds, (6) age structure of the breeding population, (7) site tenacity, (8) migration routes and wintering areas, (9) diets of the raptors, (10) occurrence and effects of environmental toxicants, (11) moulting (the last three points are studied by examining remnants of prey animals, unhatched eggs, pieces of eggshells, dead nestlings and feathers collected from and around the nests), (12) intentional destruction of nests and economic activities that might threaten the nesting site. — Special forms are available that can be completed in the field

for each species included in the inventory.

Results

White-tailed Eagle. Attempts have long been made to follow the diminishing Finnish population of the White-tailed Eagle (PALOKANGAS et al. 1970, KOIVUSAARI et al. 1970, KOIVUSAARI 1971, 1972, KULVES 1973), but it was not until 1973 that co-ordinated country-wide activities were started (KOIVUSAARI et al. 1973). They have been financed by the Finnish Fund of WWF and directed by a White-tailed Eagle working group appointed by WWF.

About 10 persons have been responsible for the annual checking of the altogether about 60 territories. Of 48 territories inspected in 1975, 30 showed evidence of the presence of the White-tailed Eagle (JOUTSAMO et al. 1975). Only 9 pairs attempted to breed (1974: 12 pairs) and only 4 nestlings fledged (1974: 10). In order to help the contaminated White-tailed Eagle population in the Baltic (HENRIKSSON et al. 1966, KOIVUSAARI et al. 1972a, 1972b, 1975), and following the example given by Sweden (HELANDER 1975), an intensive winter-feeding programme has been started in Finland (HARIO 1974). It is financed by Luonto-Liitto (a youth organization for nature protection) and WWF.

Peregrine. Studies on the Peregrine were started in 1958. They were financed by the Finnish Association for Nature Protection and led by the pioneer raptor student in Finland, Pentti Linkola (LINKOLA 1959a, 1959b, 1960, 1961, 1964). Regrettably, these studies were interrupted in 1963, because the situation was considered hopeless. Nevertheless the studies were started again in 1972, being organized by the Bureau of Natural Resources and financed by the Foundation for Finnish Nature Conservation (see ARO 1973, HÄYRINEN & SALMINEN 1974). In 1975 more than 50 people were involved in the Peregrine project: over 200 mires were checked and 16 breeding pairs of Peregrines were found (SALMINEN 1976). According to the latest estimates, the total population in Finland is less than 30 breeding pairs. Though the breeding results in 1975 was as many as 2.5 fledglings per active nest, it is too optimistic to hope that the Finnish Peregrine population can recover from its crash by itself. The Finnish Peregrine working group plans to take radical measures in co-operation with Sweden (LINDBERG 1975, WIKMAN 1976). These will include raising Peregrines in captivity, as has been done in Canada and the U.S.A.

Golden Eagle. Regular checks on Golden Eagle nests were started in 1958 and have continued without interruption. The study is organized and financed in the same way as that of the Peregrine (LINKOLA 1962, SULKAVA 1968, 1972, 1973). In some years more than 30 people have taken part in the census.

In 1975 and 1976, 99 and 88 territories were checked and, respectively, 47 and 37 inhabited nests were found (SALMINEN & SULKAVA 1976). The recent size of the Golden Eagle population in Finland is estimated to be about 100 pairs; of these only 70—80 start breeding each year. In 1960—1966 the breeding success averaged 0.6 fledglings/nesting attempt, and in 1971—1975 about 1.0 fledglings/nesting attempt. This improvement is apparently the result of lessened persecution during the breeding season (KELLOMÄKI & SULKAVA 1974, SALMINEN & SULKAVA 1976). On the other hand, in 1975 as

many as six nests were destroyed by man in a small area in Lapland (SAARI 1976, see also SALMINEN & RASSI 1976). The recoveries of ringed birds suggest that Finnish Golden Eagles are more severely persecuted during their pre-adult wanderings than, for instance, Swedish Golden Eagles (SAUROLA 1976a).

Osprey. Country-wide Osprey censuses have been carried out in the years 1971—1975 (SAUROLA 1972, 1973, 1974, 1975, 1976b). The censuses have been co-ordinated by the Ringing Bureau of the Zoological Museum of the University of Helsinki, and altogether about 100 bird-ringers have participated. The effectiveness of the Osprey census has been unique; almost all the known territories have been checked annually, in spite of the fact that the field workers have received no financial support. The Osprey territories checked each year amount to ca. 900. Of these ca. 600 have been occupied, and approximately 400 have produced fledglings. The size of the Finnish Osprey population is estimated to be about 900—1000 pairs. The annual breeding success, calculated from the material for the whole country, has been fairly uniform, ca. 1.4 fledglings/nesting attempt. The breeding success is much lower in certain areas in W and SW Finland than in other parts of the country. Special studies have been started in these areas in order to find out the reasons for the poor results.

The census has shown clearly that in southern Finland there are not enough suitable trees left for Osprey nests. To improve the situation, artificial nests have been built in certain areas (PIHLASALO & UUSITALO 1972, SAUROLA 1976b). The result has been encouraging: Ospreys have accepted these artificial nests and, according to the preliminary results, the breeding success is clearly better than in natural nests.

Material has been collected for studies of toxic substances, but the bulk of it has not been analysed. According to preliminary analyses of Finnish Osprey recoveries, the most important causes of death seem to be persecution during migration and entanglement in fishing-nets in shallow waters in Finland.

Kestrel. In 1974 the youth organization of the Finnish Association of Nature Protection (Luonto-Liitto) started a country-wide study on the Kestrel (KUUSELA 1975, 1976). In this study, Finland is divided into 22 areas. The contact person in each area passes information on Kestrels received from hundreds of observers to ringers, who perform the actual checking. In 1975, altogether 815 Kestrel territories were reported (only 209 nests were found). The total Kestrel population breeding in Finland is estimated to be about 2000—2500 pairs.

Concluding remarks

Country-wide census work on the breeding populations of the five raptor species mentioned above is now well established in Finland. However, the general picture of the other raptors is still very vague. Studies should be started as soon as possible on the Merlin *Falco columbarius* and the Sparrow Hawk *Accipiter nisus.*

Many raptor species are at least locally on the verge of extinction. It is essential that neighbouring countries should co-operate in studying raptor populations, both for the sake of pure research and for conservational purposes. Finnish working groups for raptor studies have established close contacts with corresponding groups across the Gulf of Bothnia. It is to be

hoped that closer co-operation can also very soon be achieved between these groups and their colleagues across the Gulf of Finland.

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Selostus: Suomalaisista petolintuinventoinneista

Kirjoituksessa esitellään lyhyesti suomalaisten petolintuinventointien tavoitteet, toteutus ja viimeisimmät julkaistut tulokset. Vuosittaisten valtakunnallisten tutkimusten kohteina ovat olleet merikotka, maakotka, muuttohaukka, sääksi ja tuulihaukka. Myös ruskosuohaukasta on tehty n. 10 vuotta sitten valtakunnallinen kokonaisselvitys. Tutkimukset on toteutettu Eläinmuseon rengastustoimiston, Luonnonsuojeluliiton, Luonnonvarainhoitotoimiston, Luonto-Liiton ja WWF:n Suomen rahaston organisoimina ja osittain rahoittamina.

Petolintuinventointien tulokset ovat osoittaneet, että

— merikotkan ja muuttohaukan kohdalla ovat pikaiset ja radikaalit suojelutoimet (pesien lähiympäristön ehdoton rauhoittaminen, keinoruokinta, tarhakasvatukset, munien siirrot jne.) välttämättömiä, jos halutaan, että mainitut lajit kuuluvat edelleen Suomen pesimälinnustoon
— maakotkan kohdalla pahin ongelma pesimisbiotooppien tuhoutumisen ohella on Lapissa edelleen jatkuva laiton vaino, joka olisi saatava sopivalla korvausmenettelyllä loppumaan
— vaikka Suomen sääksipopulaation pesimistulos näyttää kokonaisuudessaan melko hyvältä, ei ole vähäisintäkään aihetta huolettomuuteen, sillä tietyillä alueilla pesimistulos on ollut jatkuvasti huono ja taas toisilla alueilla on sopivista pesäpuista kova pula, joka on pyrittävä poistamaan tekopesiä rakentamalla
— tuulihaukkatutkimusta on jatkettava tehokkaasti, jotta vielä tällä hetkellä hieman epämääräinen kuva täsmentyisi.

Edellä käsiteltyjen lajien lisäksi olisi valtakunnallinen selvitys tarpeen myös muista petolintulajeista, ennen muita varpushaukasta ja ampuhaukasta.

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