On occurrence and feeding habits of Short-eared Owl in Finland 1964—68

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The occurrence of the Short-eared Owl (*Asio flammeus*) is concentrated to good vole years (e.g. ELTON 1949, HAGEN 1952). However, its food has been studied in Europe mainly during migration periods and in overwintering areas (UTTENDÖRFER 1952, RICHTER 1956 and AHO 1964, among others). Concerning nesting-time feeding, in Europe only one study from the treeless fell region of Norway has been published (HAGEN 1952). The sole paper from Finland is based on material collected in the autumn of 1958 in the neighbourhood of Tampere (AHO 1964).

In order to clarify the nesting-time feeding habits of the Short-eared Owl in Finland, we collected and examined pellet samples mainly from Central and North Ostrobothnia during the years 1964—67. The material comprises altogether 1209 prey individuals from 23 nesting sites of Short-eared Owls. Material was also obtained e.g. concerning the fluctuation in numbers of the Short-eared Owl in Ostrobothnia (Oulu province) and on Suomenselkä (Häme prov.) in 1965—68, in addition to the feeding study in question. Furthermore, H. Mikkola has made immediate observations at nesting sites in the vicinity of Oulu e.g. concerning behaviour at the nest and in preying areas (altogether 48 hrs).

On fluctuation in numbers and living habits

The Short-eared Owl is, in Finland, a northern species which still commonly nests in Ostrobothnia and on Suomenselkä but in good vole years even farther south in Southern and Central Finland, most recently in the years 1958, 1962 and 1965 (HAARTMAN *et al.* 1967—).

The occurrence of the Short-eared Owl in the years 1965—68 in Ostrobothnia and on Suomenselkä is given for five observation areas in which excursions were undertaken during each of these years on approximately the same scale (Table 1). The fluctuations in the Vilppula-Virrat area appear to have occurred at different times from those in Central and North Ostrobothnia (Alavieska-Oulu-Utajärvi). In this latter area the years 1966—67 were distinct peak years. In the Vilppula-Virrat area, however, the Short-eared Owl seems to have been most numerous in 1965 and in 1968 (cf. also MIKKOLA 1969).

In 1966—67 in the Oulu area nests of the Short-eared Owl were found very close to each other: on the Honkisuo bog of Liminka as well as at Tupos in Tyrnävä, two nests were only 300 metres apart in 1966. In these cultivated areas in 1967 there was, on the average, one pair of Short-eared Owls per km^2

TABLE 1. On the occurrence of the Short-eared Owl in Suomenselkä (Häme prov.) and Ostrobothnia (Oulu prov.) in 1965—68. Observation areas in the province of Häme the districts of I = Vilppula and II = Virrat and in the province of Oulu III = Alavieska, IV = Oulu (Oulu-Oulunsalo-Kempele-Liminka-Tyrnävä) and V = Utajärvi. A = nest or young found and B = other areas from which observations were made during breeding time. *(Suopöllön esiintyminen Suomenselällä ja Pohjanmaalla v. 1965—68. Havaintoalueet Suomenselällä I = Vilppula ja II = Virrat sekä Pohjanmaalla (Oulun läänissä) III = Alavieska, IV = Oulu ja V = Utajärvi ympäristöineen. A = pesä- tai poikuelöydöt ja B = muut alueet, joilta on pesimisaikainen havainto.)*

District	I		II		I-II		III		IV		V		III-V	
Alue	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1965	4	2	1	1	5	3	2	—	3	—	—	—	5	—
1966	—	3	—	1	—	4	5	7	8	6	4	9	17	22
1967	2	1	—	—	2	1	2	3	8	5	1	3	11	11
1968	2	2	—	4	2	6	1	2	—	1	—	—	1	3
Total *Yht.*	8	8	1	6	9	14	10	12	19	12	5	12	34	36

(at Tupos in Tyrnävä as well as on Isoaukea in Kempele, three pairs in an area of 3 km^2). — In Norway, nests 500 metres apart have been observed even in fell terrain (HAGEN 1952). In Scotland, again, the territory of the Short-eared Owl has been calculated to be only 15—20 hectares in size (MEBS 1966), according to which there might be 5—7 pairs per km^2.

At Tyrnävä and Kempele the Short-eared Owls preyed, in 1967, regularly at a distance of 1—1.5 km from their nests. Having carried the prey to the nest, the owl often returned in a straight line to the same preying area, far from the nest. In the same manner, a Short-eared Owl nesting on the shore of a lake in Sweden invariably used to fly to prey on the opposite shore, which was more than 1 km distant (CURRY-LINDAHL 1962).

In 1967, both very early and late nests were observed: as early as 9.5., a nest with six incubated eggs was found at Tupos in Tyrnävä (the first chick hatched in 11.5.). On the other hand at Hyrynsalmi (in East Finland) in two nests (2 km distant from each other) the fifth egg was laid as late as 30.6. This amounts to more than two month's difference in egg-laying time. In the area at Hyrynsalmi no Short-eared Owls at all were encountered in the first half of June; the owls in question had thus settled at their nesting sites very late. It is possible that they had emigrated during the nesting season e.g. from the vicinity of the Bothnian Gulf coast, where the vole stocks fell drastically early in 1967 (unpublished material of the Department of Zoology, University of Oulu).

This fall of the stock of, in particular, Field Voles in the area around Oulu in the spring of 1967 was, however, also early enough to affect the size of clutches laid by Short-eared Owls in the area: in 1966, five nests contained 8, 9, 9, 9 and 13 eggs (average 9.6 eggs), while in 1967 three nests had only 5, 5 and 6 eggs (average 5.3 eggs).

Nesting-time feeding habits

The composition of the food was explained on the basis of the pellets found. These were found in greatest numbers beside the walls

of barns, at the foot of fence posts, and on hummocks 20 to 200 metres from the nest. In a few instances the resting site of a male bird was also found, with tens of pellets, at a distance of 300—500 m from the nest.

The mammals were identified according to SIIVONEN (1967). Use was moreover made in identification of the skeletal collections of mammals and birds of the Department of Zoology, University of Oulu. The material from one and the same nest was collected together before the number of prey individuals was counted, which was done e.g. on the basis of the right and left mandible halves. In this way the minimum number of prey animals was found. The number would be higher if each pellet were counted separately, but an error might be incurred at the same time because parts of one and the same small mammal can be found in the pellts of the parent and of the young.

Most of the pellet samples were collected in the years 1966—67 (from ten territories in each year). Moreover, there is one sample from 1958 and one from 1964. The samples of the different years were collected in the following areas (number of nest sites and collector stated in brackets):

1958 Heinola (1 — A. Laaksonen).

1964 Kempele (1 — S. Sulkava).

1966 Liminka (2 — Kyllikki and H. Mikkola), Tyrnävä (2 — Kyllikki and H. Mikkola), Oulu (1 — Kyllikki and H. Mikkola, A. Rinttilä), Kempele (2 — S. Sulkava), Kauhava (1 — S. Sulkava), Alavieska (1 — K. Huhtala), and Vaala (1 — J. Ruuskanen).

1967 Kempele (2 — Kyllikki and H. Mikkola, S. Sulkava, J. Kujanpää), Liminka (2 — H. Mikkola, M. Henttonen), Tyrnävä (3 — Kyllikki and H. Mikkola), Oulunsalo (1 — H. Mikkola), Kiiminki (1 — Kyllikki and H. Mikkola), Utajärvi (1 — A. Mikkonen, H. Mikkola), and Hyrynsalmi (1 — H. Aarnio and K. Kinnunen).

In the nesting-time food of the Short-eared Owl the proportion of the genus *Microtus* was predominant in all the years of study, averaging 88.3 % (Table 2). Even at its lowest (Heinola, 1958) it amounted to 80.2 %. Other animals are devoured by Short-eared Owls in very small numbers, e.g. shrews, mice and Bank Voles each on an average of only 2—4 %, and birds and insects a maximum of 1 %.

After the fall of the Field Vole stocks in the spring of 1967 around Oulu in the middle of the Short-eared Owl's nesting season, the composition of the food was found to differ greatly from the average in some instances. E.g. in the pellets of young birds found at the nests in the vicinity of Oulu during the period 31.5.—4.6.1967 out of 14 prey animals five were shrews, four small birds, one a Water Vole, and only four Field Voles. The four small birds in this minor sample account for one-half of all the birds in our entire material. At Kiiminki, and perhaps also at Hyrynsalmi, the feeding habits were evidently also influenced by the location of the nest on the margin of a forest and close to a brook and by the consequent choice of prey species: of the animals devoured (altogether 47 individuals), Bank Voles and water Voles constituted 9 and 11 % and birds, 15 %. No Bank or Water Voles at all had been devoured at the nest at Kempele, which was located in the midst of wide cultivated fields.

At the nest of Utajärvi it was found in 1967 (from a pellet) that the Short-eared Owl had eaten its own chick (which had perhaps succumbed from hunger). At Kempele on 4.6.1967, H. Mikkola watched a chick in the nest, which was already large in size, harassing a smaller one and trying to swallow it alive.

On the basis of the samples collected in the area around Oulu, a more detailed comparison of the food composition in 1966 and 1967 in one and the same extensive cultivated field region (Oulu-Kempele-Liminka-Tyrnävä, Table 2) is possible. In both years, the Field Vole was the principal food of the Short-eared Owl (89—90 %) although the stock of Field Voles fell to minimal numbers in the spring of 1967 which even reduced the clutch size of the owls (cf. above). The Short-eared Owls consumed in 1967 only a few Water Voles, Bank Voles and birds, and the proportions of Harvest Mice and shrews in

TABLE 2. Percentages of food of the Short-eared Owl during breeding time at Heinola (He) 1958 and in Ostrobothnia in 1964 and 1966—67. S = South and C = Central Ostrobothnia, O = Oulu-Oulunsalo-Kempele-Liminka-Tyrnävä, Ki = Kiiminki and Hy = Hyrynsalmi. *(Suopöllön pesintäaikaisen ravinnon koostumus (%) Heinolassa (He) 1958 ja Pohjanmaalla 1964 ja 1966—67. S = Etelä- ja C = Keski-Pohjanmaa, O = Oulu-Oulunsalo-Kempele-Liminka-Tyrnävä, Ki = Kiiminki ja Hy = Hyrynsalmi.)*

Year *Vuosi*	1958	1964	1966			1967			Total
District *Alue*	He	O	S	C	O	O	Ki	Hy	*Yht.*
Sorex araneus	11	7	2	5	1.0	2.0	14	—	3.0
S. isodon	—	—	—	—	—	—	—	6	0.1
S. caecutiens	1	—	—	—	0.5	0.3	—	—	0.3
S. minutus	2	—	—	—	1.0	0.3	—	—	0.5
Insectivora total *yht*	14	7	2	5	2.6	2.5	14	6	3.9
Clethr. glareolus	5	—	4	10	—	2.1	10	6	2.5
Microtus agrestis	74	93	12	80	88.8	90.1	59	50	83.8
M. arvalis	6	—	68	—	—	—	—	—	3.7
Microtus sp.	—	—	11	—	—	—	—	—	0.5
Arvicola terrestris	1	—	2	—	—	0.4	10	11	0.8
Micromys minutus	—	—	—	5	3.6	3.3	—	—	2.7
Rodentia total *yht.*	86	93	97	95	92.4	96.6	79	73	94.0
Carduelis spinus	—	—	—	—	—	0.3	3	—	0.2
Phylloscopus trochilus	—	—	—	—	—	0.3	3	6	0.2
Jynx torquilla	—	—	—	—	—	0.1	—	—	0.1
Emberiza citrinella	—	—	—	—	—	0.1	—	—	0.1
Asio flammeus pull.	—	—	—	—	—	0.1	—	—	0.1
Cuculus canorus	—	—	—	—	—	—	—	6	0.1
Turdus iliacus — size *koko*	—	—	—	—	—	—	—	11	0.2
Anthus sp. — size *koko*	—	—	—	—	—	—	—	6	0.1
Aves total *yht.*	—	—	—	—	—	0.8	7	28	1.1
Insecta	—	—	2	—	5.1	0.3	—	—	1.0
Material *Aineisto*	111	14	56	20	196	765	29	18	1209
Number of nests *Tutkittuja pesiä*	1	1	1	1	8	9	1	1	23

the food were only a little larger than in 1966. This implies that Short-eared Owls are not able to efficiently replace Fields Voles with other kinds of food.

However, other *Microtus* species may also constitute the principal food of the Short-eared Owl. In the following, our material from North Ostrobothnia has been compared with that of AHO (1964) from Tampere:

	Northern Ostrobothnia 1966—67 (nesting season) %	Tampere 1958 (autumn) %
Microtus agrestis	89.3	12.6
M. arvalis	—	73.5
Microtus sp.	—	7.5
Other small rodents	5.0	2.5
Soricidae	2.8	1.9
Aves	0.5	1.1
Insecta	2.7	0.7
Samples in the material	990	820

The materials differ greatly only in respect of the occurrence of *Microtus* species. In Ostrobothnia most of these were Field Voles but at Tampere Common Voles. This is accounted for by the distribution area of the Common Vole, which does not extend in Finland as far as Central and Northern Ostrobothnia (SIIVONEN 1967). In Southern Ostrobothnia, too, the Common Vole seems to be the Short-eared Owl's principal food in occasional places: our sample from Kauhava (56 specimens) consists of 68 % Common Voles and only 13 % Field Voles. In Southern Ostrobothnia, the Common Vole is in fact commonest in extensive, open, cultivated fields (SULKAVA & SULKAVA 1967), from which kind of terrain the sample in question was obtained. — It may be mentioned that in the fells in Norway a third *Microtus* species common there is dominant, namely the Root Vole; according to HAGEN (1952) its contribution is 47 % (against 20 % for the Field Vole). In Germany again, for instance, the Common Vole accounts for the major part of the food of the Short-eared Owl, 74 % (Field Vole: 16 %) (MEBS 1966).

Selostus: **Suopöllön esiintymisestä ja ravinnosta Suomessa vuosina 1964—68.**

Vuosina 1964—68 suopöllöjä tavattiin eniten Vilppulan-Virtain alueella 1965 ja 1968, Keski- ja Pohjois-Pohjanmaalla sen sijaan 1966—67. Oulun ympäristön peltoaukeilla oli tällöin keskim. 1 pari/km². Kahden pesän väliä oli kerran vain 300 m, mutta pöllöt saalistivat usein 1—1,5 km:n päässä pesiltään. Munintakausi kesti v. 1967 huhtikuun puolivälistä kesäkuun loppuun. Keskimääräinen munaluku oli 1966 Oulun ympäristössä 9.6 (5 pesää) ja 1967 vain 5.3 (3), mikä johtui peltomyyräkannan romahtamisesta keväällä 1967.

Ravinto on selvitetty oksennuspalloista, joita löytyi eniten 20—200 m pesästä aidanseipäiden ym. levähdyspaikkojen viereltä. Peltomyyrät (*Microtus*-suku) muodostivat kaikkina aineiston keruuvuosina yli 80 % (keskim. 88.0 %), suopöllön ravinnosta. Päästäisiä, hiiriä ja metsämyyriä aineistossa on vain 2—4 % kutakin sekä lintuja ja hyönteisiä alle 1 %. V. 1967 muutamat Oulun läänin suopöllöparit, jotka useimmista tutkituista pareista poiketen pesivät metsän tuntumassa, söivät päästäisiä, metsämyyriä ja lintuja huomattavasti enemmän (pienissä aineistoissa on 10—20 % kutakin), ja myös vesimyyriä (n. 10 %). Poikkeavaan ravinnon koostumukseen vaikutti pesien sijainnin lisäksi peltomyyrien niukkuus kesällä 1967. Suopöllöt eivät kuitenkaan kykene tehokkaasti korvaamaan peltomyyriä muilla saaliseläimillä. V. 1967 munaluku oli pienempi kuin 1966 ja pesillä todettiin jopa omien poikasten syöntiä.

Suopöllön pääsaalislaji vaihtelee eri *Microtus*-lajien levinneisyyden ja runsaussuhteiden mukaan. Keski- ja Pohjois-Pohjanmaalla pääsaalis on peltomyyrä, jo paikoin Etelä-Pohjanmaalla ja esim. Saksassa yleisesti kenttämyyrä ja mm. Norjan tunturiseuduilla taas lapinmyyrä.

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First occurrence of Pallas' Sea Eagle (*Haliaeetus leucoryphus*) in Finland

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In the bird collections of the Kuopio museum there has for a long time been an immature sea-eagle, the exact taxonomy of which has remained unknown although it has caused some speculation. The bird, a male, had been caught in some fishing nets and was killed on the 30.6.1926 in Juovesi, near Kuopio. It was prepared by Matti Karppanen, who was a well-known artist as well as a good ornithologist and who worked as taxidermist for the Kuopio museum until his death in 1953. Karppanen often painted pictures of the birds he prepared, besides taking detailed written notes on their structure and colouring. Since his curiosity was aroused by the strange colour distribution of this specimen he sent a painting of the bird to Dr. Hortling, the renowned ornithologist. Hortling, too, was puzzled, even more so after receiving the bird and being able to compare it with sea-eagles in the collections of the Zoological museum of the University of Helsinki. In 1927 he published an article on the specimen in Ornis Fennica, and gave a thorough description of its morphology. He was inclined to regard it as a strange, individual variant of the White-tailed Sea Eagle (*Haliaeetus albicilla*), but at the same time he remarked on the many morphological traits which decidedly set this bird apart from the native species.

The Kuopio specimen is shorter and more lightly built than *H. albicilla*,