Effects of the Severe Winter of 1965/66 upon Winter Bird Fauna in Finland

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Introduction

Since the winter of 1956/57 a bird count organized by the Zoological museum of the University of Helsinki has been carried out each winter in various parts of the country. The count is performed on a locally selected day between December 25th and January 6th when the weather conditions are favourable, and all birds observed along a predetermined route are recorded. An attempt has been made to maintain the same routes from year to year to obtain comparable data on the yearly variations in the bird fauna. In recent years the number of routes has varied between 415 and 550. The results are collected on punched cards and later on will be processed with the help of a computer (for more details, see KOSKIMIES 1957, 1966).

The winter of 1965/66 was exceptionally cold and snowy in Finland (Table 1). In many localities in the country the snow was a half m. deep as early as late December, and by late February it was one m. deep in southern Finland and in Lapland. In the central and western parts of the country there was less snow. Observations reported from various parts of the country suggested that many bird species had suffered considerable losses. To obtain an idea of the winter mortality rate a further count was taken in late winter, between February 25th and March 6th. A letter requesting this second count was sent to all groups which had participated in the mid-winter count. Nearly half of them took part in the second count (508 routes at the New Year, 245 in late winter). It was emphasized in the instructions for the second count that this should be performed on exactly the same route and using a similar method as the earlier count so that the results could be compared.

A corresponding late-winter check count has been carried out on 9—20 routes in the Helsinki area since the winter of 1959/60 (HILDÉN 1965, HILDÉN & MIKKOLA 1966, 1967, 1968). In the following certain results of these counts are referred to for comparison.

TABLE 1. The monthly mean and minimum temperatures for 11 localities in Finland in the winter of 1965/66. The mean monthly temperatures based on long-term observations (1931—1960) are given in italics. *(Keski- ja minimilämpötilat kuukausittain 11 paikkakunnalla Suomessa talvella 1965/66. Pitkäaikainen keskiarvo vuosilta 1931—60 kursivoitu.)*

Locality *Paikkakunta*	December *Joulukuu*			January *Tammikuu*			February *Helmikuu*		
	Mean *Keski*	1931 —60	Minim. *Alin*	Mean *Keski*	1931 —60	Minim. *Alin*	Mean *Keski*	1931 —60	Minim. *Alin*
Turku (60°30'N, 22°15'E)	— 4.6	*—2.7*	—18.5	—11.7	*— 6.9*	—28.0	—13.5	*— 6.6*	—35.2
Helsinki (60°10'N, 24°55'E)	— 2.4	*—1.9*	—14.4	—12.0	*— 6.1*	—22.3	—12.6	*— 6.6*	—32.7
Lappeenranta (61°05'N, 28°10'E)	— 4.9	*—5.0*	—17.4	—15.9	*— 8.6*	—30.4	—15.4	*— 8.6*	—33.3
Tampere (61°30'N, 23°45'E)	— 5.8	*—3.9*	—22.6	—14.9	*— 7.9*	—32.0	—15.9	*— 8.0*	—36.8
Jyväskylä (62°15'N, 25°45'E)	— 7.1	*—5.8*	—23.8	—17.2	*— 9.4*	—32.9	—17.3	*— 9.2*	—38.5
Joensuu (62°35'N, 29°45'E)	— 6.8	*—6.5*	—23.3	—19.9	*—10.5*	—36.1	—19.2	*—10.4*	—36.1
Vaasa (63°05'N, 21°35'E)	— 7.8	*—3.7*	—24.9	—14.9	*— 7.3*	—32.1	—18.2	*— 7.5*	—38.6
Kajaani (64°15'N, 27°45'E)	— 9.1	*—7.0*	—28.5	—19.7	*—10.6*	—40.3	—20.8	*—10.6*	—42.8
Oulu (65°00'N, 25°30'E)	—10.0	*—6.0*	—29.5	—18.4	*— 9.5*	—35.1	—19.8	*— 9.9*	—41.5
Rovaniemi (66°30'N, 25°45'E)	—12.5	*—8.1*	—29.5	—21.3	*—13.0*	—40.0	—22.4	*—12.2*	—44.3
Sodankylä (67°25'N, 26°35'E)	—14.8	*—9.8*	—35.3	—21.3	*—13.5*	—41.8	—23.8	*—13.0*	—44.7

On the causes of variations in the numbers of winter birds

In order to interpret correctly the results of the mid- and late-winter bird counts certain factors causing true or apparent differences in the numbers of birds along the census routes should be taken into account.

1) *Winter movements.* The entire population or a part of it moves away from the area, or birds move in from elsewhere. Species liable to make long-range movements according to food and weather conditions are e.g. *Carduelis spinus, C. flammea, Bombycilla garrulus,* the *Larus* species and, in winters with an abundant berry crop, also *Turdus pilaris.*

2) *Habitat changes.* The birds may move from one type of habitat to another in the course of the winter, for instance move into more densely settled areas as food becomes scarce or, on the other hand, already in late February or early March begin to disperse from their winter congregation areas. This may affect the results of the count for many species, although its effect depends on the weather and snow conditions at the time of the count. If, for instance, at the New Year it is mild and there is only little snow, such birds of agricultural areas as *Corvus monedula, Chloris chloris* and *Emberiza citrinella* remain largely scattered and only later congregate in good feeding areas. If, on the other hand, a spell of warm spring weather occurs during the late-winter count, such species as *Corvus corone, Parus major* and *Anas platyrhynchos,* for instance, begin to disperse from their winter-

ing centres. This was the case in the winter of 1965/66. On the other hand, local movements between different habitats have a noticeable influence only on the results of individual counts, whereas with larger samples covering a variety of different habitat types the effects are in part evened out.

3) *Winter mortality.* The effect of this factor can be ascertained only for those species which remain on the same sites throughout the winter, such as *Pica pica, Regulus regulus, Certhia familiaris, Parus cristatus, P. montanus* and *Dendrocopus major.* The more mobile the species, the more the reduction in numbers caused by true winter mortality tends to be obscured by changes resulting from the two above-mentioned factors.

Furthermore, differences between the mid- and late-winter counts may only be apparent ones and result from different error factors:

1) *Chance.* With regard to scarce or gregarious species the data from individual routes remain so scant that the degree and direction of the apparent change is determined largely by chance. In the combined data for the entire country, however, such chance effects tend to even out so that, with the exception of the most scarce species, changes in the total figures may be considered real.

2) *Change of behaviour.* At the time of the second count *Chloris chloris* and *Parus major,* for instance, sing and *Picus canus* utters its piercing display call; these species therefore obviously attract the attention of the observer more easily. Similarly the other *Parus* species and *Garrulus glandarius,* for instance, on bright, clear days in late winter call more intensively than during the darkest season in mid-winter. The mid-winter flocks of *Loxia curvirostra* have already scattered in pairs at the time of the second count. In all, this factor probably affects only few species but unfortunately its effect cannot be reliably estimated.

3) *Weather on the day of the count.* Temperature, cloud, wind, and snowfall greatly influence the activity of birds and hence the possibilities of observing them. The participants were, however, instructed to perform the count on a day with favourable weather, not during strong wind or snowfall, for instance. Nevertheless, the differences in the results of the two counts of individual routes may in part be the result of weather conditions. However, on both times the counts are distributed over a period of nearly two weeks, so that in the combined data for the entire country the differences caused by the weather are largely cancelled out.

Results

In Table 2 the total numbers and constancy values of the most important species in the mid-winter and late-winter counts in 1965/66 are given as well as the percentages indicating the change. These figures, which show the number recorded in the second count as a percentage of that noted in the first one, are used throughout the following text to characterize the change in the numbers of each species. Only those 245 routes which were counted on both occasions are included.

For a discussion of the results the winter bird species can be grouped into two rather different categories: migratory species on the one hand and local residents on the other.

Migratory species. — The frequency of the *Carduelis* species in winter time, in part also their abundance at breeding time and the course of their migration, depend primarily on food conditions. They are physiologically prepared for migration throughout the winter and move from one place to another as food becomes scarce. According to the results of the counts, *Carduelis carduelis* disappeared entirely and the numbers of *C. spinus* and *C. flammea* were greatly reduced in the period between the first and the second counts. This is a normal phenomenon in Finland and without doubt occurs as the supply of seeds from the plants which provide their food is exhausted or these plants are covered by snow (see HILDÉN 1968, for *C. flammea* also HILDÉN & MIKKOLA 1967, PEIPONEN 1967).

An opposite pattern of occurrence is exhibited by *Chloris chloris.* It was clearly more abundant (141 %) in the second than in the first count. In Helsinki this has been found to happen nearly every winter as, with the exception of two years, the numbers of Greenfinches in all nine winters have

TABLE 2. The total numbers and constancy values (=percentages of routes on which the species was observed out of all routes) of the most important species in mid-winter (I) and late winter (II) counts in 1965/66. (*Keski- (I) ja lopputalven (II) laskentojen kokonaismäärät ja konstanssiarvot (= niiden reittien, joilla laji tavattiin, prosenttiosuus kaikista reiteistä) tärkeimpien lajien osalta 1965/66.*)

	Total numbers *Yhteensä*			Constancy *Konstanssi*	
	I	II	%	I	II
Corvus corax	116	112	96.6	14.1	12.0
C. corone	11638	8322	71.5	85.9	89.2
C. monedula	6615	5696	86.1	38.6	46.1
Pica pica	2755	2772	100.6	91.7	90.0
Garrulus glandarius	356	404	113.5	51.5	44.0
Perisoreus infaustus	21	38	181.0	3.3	4.6
Chloris chloris	548	773	141.1	20.7	19.5
Carduelis carduelis	83	—	—	5.8	—
C. spinus	113	29	25.7	7.1	1.7
C. flammea	863	108	12.5	35.3	4.6
Pyrrhula pyrrhula	2361	1707	72.3	84.2	62.2
Pinicola enucleator	73	28	38.4	3.3	2.5
Loxia sp.	739	637	86.2	25.3	26.6
Fringilla coelebs	22	1	4.5	5.0	0.4
F. montifringilla	18	9	50.0	4.6	2.5
Passer domesticus	10068	8916	88.6	77.8	79.3
Emberiza citrinella	10031	7366	73.4	83.4	75.9
Certhia familiaris	203	75	36.9	35.7	18.3
Parus major	9475	8182	86.4	96.7	95.9
P. caeruleus	747	594	79.5	47.3	39.8
P. ater	366	237	64.8	32.4	27.4
P. cristatus	617	375	60.8	56.8	42.7
P. montanus	1978	1662	84.0	83.8	79.3
Aegithalos caudatus	337	66	19.6	14.9	5.0
Regulus regulus	931	107	11.5	48.1	15.4
Lanius excubitor	13	4	30.8	5.0	1.7
Bombycilla garrulus	159	6	3.8	9.1	0.4
Turdus pilaris	15	7	46.7	3.7	2.1
T. merula	49	22	44.9	13.7	5.0
Cinclus cinclus	64	33	51.6	9.1	6.2
Dendrocopos major	108	70	64.8	25.7	18.3
D. minor	17	7	41.2	5.8	3.7
Picoides tridactylus	20	9	45.0	7.5	3.7
Dryocopus martius	36	32	88.9	11.6	10.4
Accipiter gentilis	31	17	54.8	12.0	5.8
A. nisus	75	49	65.3	25.3	19.1
Anas platyrhynchos	10088	8678	86.0	19.1	16.6
Larus canus	91	—	—	1.2	—
L. argentatus	620	83	13.4	4.6	1.7
L. marinus	12	2	16.7	2.5	0.4
Lagopus lagopus	98	91	92.9	12.4	8.7
Lyrurus tetrix	1630	920	56.4	34.0	26.1
Tetrao urogallus	95	52	54.7	17.8	11.6
Tetrastes bonasia	136	60	44.1	20.3	11.2
Perdix perdix	454	282	62.1	17.0	13.7
Phasianus colchicus	254	247	97.2	16.6	14.1

increased toward late winter, in some years more than doubled. This is no doubt caused by the fact that the flocks which, in early winter, live partly scattered over fields of grain and weeds tend to congregate more heavily around feeding places in settled areas as the winter progresses.

Bombycilla garrulus is very irregular in its occurrence, and its abundance at the New Year in Finland varies greatly from one year to another. It seems to be a general rule that the flocks are reduced to a small fraction or disappear entirely toward late winter, as was also the case in the winter of 1965/66. This is caused by the fact that the staple winter food of these birds, berries and, in particular, those of the mountain ash, are generally eaten up in early winter, which forces the birds to move elsewhere.

The winter occurrence of gulls (*Larus argentatus, L. canus* and *L. marinus*) is more dependent on ice than on food conditions. As long as the sea remains partly open, gulls are common on the Finnish coasts, mainly in harbours. But as the sea freezes over they move further toward the south-west to the open waters of the Baltic Sea. Because of the severe winter gulls disappeared shortly after the turn of the year in 1965/66, but due to a mild period in late February a small number of Herring Gulls had already returned at the time of the late-winter count.

Resident species. — With regard to this group of species true winter mortality can be studied, although for some of the species the effect of the error factors dealt with above must be borne in mind. It must also be noticed that the figures given here do not represent the mortality rate during the entire winter but during a period of two months only.

All corvids survived the severe winter successfully. *Corvus corone* seems to have diminished more than the others (72 %), but due to the mild weather during the second count Crows had obviously already started to disperse from their wintering centres, which reduced their numbers in this count. A good survival of this species is indicated by the result of the counts in the Helsinki area (80 %), which corresponds well with the results of the other years (52—86 %, average 75 %). The higher figures of *Garrulus garrulus* and *Perisoreus infaustus* in the second count are caused by the more conspicuous behaviour of these species in late winter.

Also the most common seed-eating winter birds, *Emberiza citrinella, Passer domesticus, Pyrrhula pyrrhula* and *Loxia curvirostra,* seem to have survived the winter well. This is indicated also by the fact that their results are very close to the mean results of the nine years of data from the Helsinki area, which are 75 % for *Emberiza citrinella* and 71 % for *Pyrrhula pyrrhula* (for *Passer domesticus* and *Loxia curvirostra* the data are insufficient).

A great reduction of the numbers of tits was expected after the severe winter. Surprisingly, however, the winter mortality rate seems to have remained fairly low, as is seen from the results indicating the survival: *Parus major* 87 %, *P. montanus* 84 %, *P. caeruleus* 80 %, *P. ater* 65 % and *P. cristatus* 61 %. It should, however, be emphasized that these figures are probably somewhat high because of the greater vocal conspicuousness of the tits in late winter; for the Blue Tit, for instance, the results of counts in the Helsinki area have in six years out of the nine been higher in the second than in the first count. However, this source of error influences the results each year, and in the results for Helsinki the winter of 1965/66 did not suggest exceptionally poor survival as can be seen from the following table.

	1965/66	1959/60 Mean	1967/68 Range
Parus major	89 %	98 %	87—120 %
Parus caerulens	97 %	110 %	64—144 %
Parus ater	91 %	57 %	39— 93 %
Parus cristatus	63 %	69 %	37— 91 %
Parus montanus	73 %	66 %	38—102 %

On the other hand, *Aegithalos caudatus* suffered heavy losses, and only a fifth of the numbers in mid-winter were observed in the second count. This species is known for its poor tolerance of severe winters, which is also reflected in the steep fluctuations of its numbers. Also about ⅔ of the winter population of *Certhia familiaris* seems to have succumbed according to the present results. In the series from the Helsinki area losses in this winter were heavier than in the other winters: in 1965/66 the result was 25 %, in the others it varied between 33 and 91 % (50 % on the average).

However, the heavist disaster struck the population of *Regulus regulus*: only 11 % of the mid-winter population could be found during the second count. This species is known to be the one most adversely affected by low winter temperatures (KLOCKARS 1936, PALMGREN 1936, BERGROTH & BRUUN 1939, LEHTONEN 1948), and, as a rule, in severe winters the bulk of its over-wintering population is wiped out. Thus during the three last winters (1965/66, 1966/67, 1967/68), which have all been exceptionally cold, the fraction of the population present at the time of the second count in the Helsinki area has been 5, 3 and 6 %, whereas in the mild winters of 1961/62, 1963/64 and 1964/65 the corresponding figures were 80, 87 and 62 %, respectively (HILDÉN & MIKKOLA 1968).

The poor survival of *Cinclus cinclus* is striking: according to the results nearly half of the winter population was destroyed. The species is quite local in winter time, so that the results probably reflect the truth. Severe winters are obviously disastrous for the Dipper, because when the smaller water courses freeze, congestion and competition develop in those areas still open, which prove fatal to the weaker individuals.

As for woodpeckers, the most reliable data refer to *Dendrocopos major,* which is the most abundant species and lives in small well-defined territories throughout the winter. This species was scarce in Finland in the winter of 1965/66, and according to the counts 68 % of the population survived till spring. In the meagre data the corresponding figures for *D. minor* and *Picoides tridactylus* were 59 and 45 %, respectively. For both species a distinct decrease toward late winter was found in the Helsinki area (HILDÉN & MIKKOLA 1966) and at Kerava, about 25 km north of Helsinki, a dead Three-toed Woodpecker was found in a hollow birch on April 18th, 1966 (SARKANEN 1967). For *Dendrocopos leucotos* the scant data (7 in mid-winter, 2 in late winter) do not justify conclusions. *Dryocopus martius* survived the winter well (88 %). The figures for *Picus canus* are useless, as this species is very quiet in winter time, whereas its loud call makes it most conspicuous in early March.

The results for *Accipiter gentilis* (55 %) and *A. nisus* (65 %) conform well to expectations, because the winter losses of these species are heavy even during normal winters due to harassing by man. The populations of the most important prey animals of the Goshawk, viz. gallinaceous birds and the squirrel, were average or slightly below average in 1965/66 (HELMINEN 1966), but apparently sufficient to prevent more serious losses of this species. It has been shown, namely, that the Goshawk suffers heavy losses whenever a severe winter and a decline of its prey coincide (LINKOLA 1957).

The figures for the gallinaceous forest

birds are fairly uniform (*Lyrurus tetrix* 56 %, *Tetrao urogallus* 55 %, *Tetrastes bonasia* 44 %), but the reduction seems too large to reflect the mortality of the two winter months. The considerably higher value for *Lagopus lagopus* (93 %) cannot be considered reliable because of the small number of observations. The survival of *Perdix perdix* (62 %), a species known to be susceptible to snowy winters, must be considered good. Very surprising is the excellent overwintering result of *Phasianus colchicus* (97 %). This species has not been considered well adapted to the conditions of Northern Europe because of its assumedly poor winter survival. An explanation for the small losses of Pheasants in the cold and snowy winter of 1965/66 is obviously to be found in their efficient articial winter-feeding and protection, because the species is entirely dependent on human support in winter time. Apparently the Finnish Pheasant population has also gradually adapted to cold winters, as natural selection obviously tends to eliminate the types less tolerant to cold.

Of the overwintering migratory species the largest body of data concern *Anas platyrhynchos*. Its survival was in fact even better than indicated by the results of this study (86 %), because during the mild period of early March, 1966, the ducks had already started to leave their winter congregation areas. Its good winter hardiness like that of the Pheasant is due to efficient artificial feeding, as the bulk of Mallards included in the counts are semi-wild birds overwintering in centres of human population. In Helsinki, which supports the largest winter population of Mallards in Finland, these birds have each winter survived quite well: the result of the counts has been 87—116, on the average 100 %!

Overwintering migratory passerines, on the other hand, suffered heavy losses in 1965/66, although the data are sufficient to indicate only roughly the degree of loss. Of the most common species *Turdus pilaris, T. merula, Fringilla montifringilla* and *Lanius excubitor* were reduced to not more than half of their numbers at the time of the mid-winter count. Occasional overwinterers, whose normal winter grounds lie in Central and Southern Europe, did worse still. Thus scattered observations concerning the following species were made in the mid-winter count but not in the late-winter count: *Falco tinnunculus, F. columbarius, Sylvia atricapilla* and *Carduelis cannabina.*

Data obtained on the survival of the occasional overwinterers were, however, very scant, because as a whole they seemed to be exceptionally infrequent in the winter of 1965/66. For instance, *Alauda arvensis, Erithacus rubecula* and *Troglodytes troglodytes* were not found on the census routes at all. From earlier experience it is, however, known that such species tolerate even normal winters rather poorly. It was therefore surprising that in Turku individual examples of *Prunella modularis* and *Sitta europaea* survived the hard winter. Waterfowl occasionally overwintering in open water areas also survived well. Thus in the first count 44 individuals of *Bucephala clangula,* 2 of *Clangula hyemalis* and 4 of *Mergus albellus* were observed, in the second count 49, 3 and 1, respectively. Waterfowl seem in fact to be relatively unaffected by cold, if only their feeding waters remain open.

Behaviour during severe cold and birds found dead

The observers were requested to submit, together with the census results, observations concerning birds found dead and special behaviour features during severe cold. Most of these reports related to *Parus major.*

In 15 replies Great Tits, in some cases several individuals, were reported to have been found dead. In many replies it was stated that their numbers had greatly decreased after periods of severe cold. For instance, in Vimpeli (63°10'N, 23°50'E) only one of eight Great Tits using a feeding station survived till spring; one dropped dead in flight in a temperature of —43°C! On very cold days the birds were unable to cope with the problem of feeding, as they had to keep their legs in the shelter of the plumage and were not able to chop fat or seeds properly. According to several reports they frequently entered outbuildings, such as barns, and even dwelling houses.

Judging from these reports the result of the counts, according to which only 13 per cent of the Great Tits succumbed during January and February, gives a too low figure for their winter mortality. On the other hand, these scattered observations carry not much weight, as comparable data from other winters do not exist.

From Ilmajoki (62°45'N, 22°25'E) it was reported that Sparrows (*Passer domesticus*) were not shy of people during the coldest weather and that upon alighting they nearly always tumbled over, which suggests that their legs had frozen. In Helsinki Blackbirds (*Turdus merula*) in temperatures of —20—30°C sat for most of the day nearly immobile like feather balls around the feeding stations and only now and then took pieces of food lying in front of them. From Oravainen (63°20'N, 22°25'E) reports were received of certain gallinaceous birds (*Tetrao urogallus, Lyrurus tetrix, Tetrastes bonasia, Lagopus lagopus*) spending up to four days in succession buried from sight in deep snow during the most severe periods of cold. This has also been reported before. After feeding the birds flew straight back into the snow.

Of the birds found dead mention might be made of *Passer domesticus, Pyrrhula pyrrhula* and *Parus montanus* (a few individuals of each), *Regulus regulus* (4), *Perdix perdix* (3), *Aegolius funereus* (2), and *Dendrocopos minor* (1).

Discussion

The severe winter of 1965/66 did not prove as disastrous to the birds as had been expected. The fact that the losses of *Parus major, Passer domesticus, Anas platyrhynchos* and *Phasianus colchicus,* for instance, were quite low, indicates the vital importance of food for winter birds. These species are, as is known, entirely dependent on food supply from human inhabitations for their winter survival, primarily on direct feeding, and in natural conditions they would have hardly any chances of survival in Finland. Similarly the corvids, *Chloris chloris, Pyrrhula pyrrhula, Emberiza citrinella* and *Parus caeruleus,* which also survived well, are reliant for their winter food supply primarily on direct human support. It can thus be said that for most winter species food is a far more decisive factor than cold: if only food is available, even many species generally considered winter-sensitive are able to survive with small or reasonable losses through a severe winter. From this one may conclude that, as a result of the increase in the human population and the present-day high standard of living, the feeding conditions of many birds have improved greatly so that severe winters no longer prove as disastrous to bird fauna as in earlier years as, for example, the war winters of 1939—42.

Exceptions to this rule are certain migratory birds which overwinter in Finland occasionally or in small numbers and which are not adapted to the severe climate of this area. They cannot stand very low temperatures even though food is available. Only because of the easy food supply can even a small fraction of these birds survive. Such occasional overwinterers always congregate around human inhabitation to especially favourable feeding places, where also microclimatically favourable roosting sites can be found in buildings or sewage channel

openings, for instance. The complete dependence of these birds upon man is shown by the observations of Blackbirds mentioned above; obviously they would not have been capable of actively and independently searching for food themselves.

The very smallest species, such as *Regulus regulus, Aegithalos caudatus* and *Certhia familiaris,* are also sensitive to low temperatures and suffered heavy losses in 1965/66.

Summary

1. The winter of 1965/66 was very cold and snowy in Finland (Table 1). Its effects upon the winter bird fauna were studied by means of two counts performed on 245 routes in different parts of the country, the first at the New Year, the second at the turn of February—March.

2. Differences between the results of the two counts reflect in part true changes in the fauna caused by winter movements, habitat changes and winter mortality. In part they are only apparent and due to factors such as chance, change of the birds' behaviour or differences in the weather on the day the census was taken.

3. The results for the most significant species are presented in Table 2. The sharp decrease in the numbers of the *Carduelis* and *Larus* species as well as of *Bombycilla garrulus* was caused by movements to other areas, as the food situation got worse. All corvids, the most common seed-eating winter birds (*Emberiza citrinella, Passer domesticus, Pyrrhula pyrrhula, Chloris chloris, Loxia curvirostra*), *Dryocopus martius* as well as *Phasianus colchicus* and *Anas platyrhynchos,* both benefiting from efficient artificial feeding, survived the winter well. The winter mortality of tits, too, was smaller than expected. The heaviest losses were found in the populations of *Regulus regulus, Aegithalos caudatus* and *Certhia familiaris* as well as of many overwintering migratory species.

4. The census results show that for most winter birds food is a far more decisive factor than cold itself. If only food is available, most species survive even a severe winter with small or reasonable losses. Nowadays the abundant sources of food available near human inhabitation and direct feeding mean that severe winters are no longer so destructive to bird populations than they were before.

Selostus: Ankaran talven 1965/66 vaikutukset talvilinnustoon Suomessa

1. Talvi 1965/66 oli Suomessa erittäin kylmä ja luminen (taul. 1). Sen vaikutuksia talvilinnustoon pyrittiin tutkimaan laskennoilla 245 reitillä eri puolilla maata kahdesti talven aikana, ensimmäisen kerran vuodenvaihteen aikoihin, toisen kerran helmi—maaliskuun vaihteessa.

2. Muutokset molempien laskentakertojen tuloksissa ovat osaksi todellisia ja johtuvat vaelluksista, olinpaikkojen muutoksista ja kuolleisuudesta, osaksi näennäisiä ja sattuman, lintujen käyttäytymisen muuttumisen tai laskentapäivän sään aiheuttamia.

3. Laskentojen tulokset on tärkeimpien lajien osalta esitetty taulukossa 2. *Carduelis*-lajien, lokkien ja tilhen jyrkkä väheneminen johtui vaeltamisesta muualle talven aikana ravintotilanteen huononnuttua. Kaikki varislinnut, yleisimmät siemeniä syövät talvilinnut (keltasirkku, varpunen, punatulkku, viherpeippo, käpylintu), palokärki sekä ihmisten tehokkaasti ruokkimat fasaani ja sinisorsa selviytyivät talvesta hyvin. Myös tiaisten talvikuolleisuus oli odotettua pienempi. Suurimmat tappiot kärsivät hippiäinen, pyrstötiainen ja puukiipijä sekä monet talvehtivat muuttolinnut.

4. Laskentatulokset osoittavat, että useimpien lajien osalta ravinto on talvilinnuille selvästi suurempi ongelma kuin pakkanen: jos vain ravintoa on riittämiin, pystyvät useimmat lajit selviytymään ankarastakin talvesta pienin tai kohtuullisin tappioin. Nykyisin asutuksen tarjoamat runsaat ravintolähteet sekä suoranainen ruokinta aiheuttavat sen, etteivät ankarat talvet ole linnustolle yhtä tuhoisia kuin ennen.

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Tiedonantoja

Viirupöllön (*Strix uralensis*) sukukypsyydestä

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Tiedot maassamme pesivien pöllölajien sukukypsyydestä ovat perin puutteelliset. Lehtopöllöä (*Strix aluco*) ja helmipöllöä (*Aegolius funereus*) lukuunottamatta muista lajeista ilmoitetut sukukypsyysiät perustuvat vain oletamuksiin tai arvioihin. Viirupöllön olettavat Koivu ja Valkeila olevan sukukypsä vasta 2-vuotiaana (ks. v. HAARTMAN *et al.*, 1963—1967. Pohjolan linnut värikuvin, s. 573). Näin ollen on syytä julkaista viimeksi mainitusta lajista kaksi havaintosarjaa, jotka valaisevat puheena olevaa kysymystä.

1) Keväällä 1967 pesi Kurun pitäjän Länsi-Teiskon kylän takamailla vanhassa kanahaukan pesässä viirupöllöpari, joka tuotti yhden jälkeläisen. Toukokuun 23. päivänä pesässä ollut poikanen oli iältään 5—6 vuorokautta, joten kuoriutuminen oli tapahtunut noin 18—19. päivänä. Poikanen rengastettiin 1.6.

Seuraavana keväänä (1968) pesäpönttötarkistuksissa löytyi viirupöllöpari Ylöjärven Kuljusta, 7 kilometriä edellä mainitusta pesäpaikasta lounaaseen. Pöntössä oli 15.4. pesäkuoppa, jonka laidoilla liehui lajille kuuluvia untuvia ja höyheniä. Saman kuun 26. päivänä pesässä oli 2 munaa, joita naaras hautoi. Pöntössä sitkeästi pysytellyt naaras otettiin kiinni 20.5., jolloin munista oli kehittynyt kaksi pientä poi-