

THE PEREGRINE POPULATION IN FINLAND

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ABSTRACT

The decline of the Finnish Peregrine population continued into the 1970s. Birds were wiped out from the southern parts of the country, and the remnant population was restricted to two rather well-defined areas in the north. Cliff-nesting all but ceased, and the remaining pairs are mostly nesting on the ground in large bogs. Since 1970 territorial pairs have been found on 58 sites (bog 53, tree 3, cliff 2). The largest number of pairs discovered in any one year was 32 in 1981. The Peregrines are known to have moved considerably from year to year. The greatest known distance between two nest sites of the same pair is 8.5km. Attempts to estimate population size from rates of nest site occupancy would thus be futile. A crude figure of 40–50 pairs seems appropriate, but is little more than guesswork. Reproductive success improved considerably in the 1970s. The average production in 1975–81 was 1.6 young per territorial pair. This figure compared favourably with those for other increasing populations.

INTRODUCTION

The early history of the Peregrine (*Falco peregrinus*) in Finland has been described by Linkola & Suominen (1969). During the 1960s the population declined very rapidly and the species was expected to become extinct in Finland by 1970. Thus few data are available covering 1964–72. In 1972 the Finnish Association for Nature Protection conducted a survey of known nest sites (Aro 1973). Some 300 sites were checked, but mostly in the southern parts of the country, and the results were not encouraging. Most of the remaining active sites were on bogs in the northern parts of the country. Most occupied sites were checked again in 1973/74 (Häyrinen & Salminen 1974), and in late 1974 the World Wildlife Fund initiated a Peregrine working group and thereafter provided funding and other facilities for the census work. In addition, a large number of bogs have been surveyed by the Bureau of Natural Resources of the Ministry of Agriculture and Forestry.

NEST SITES

As the remaining Peregrines were on the northern bogs, work was concentrated on this habitat. Originally some 34 percent of the total land area in Finland was peatland, and in some northern regions 50 percent or more was bog of some kind

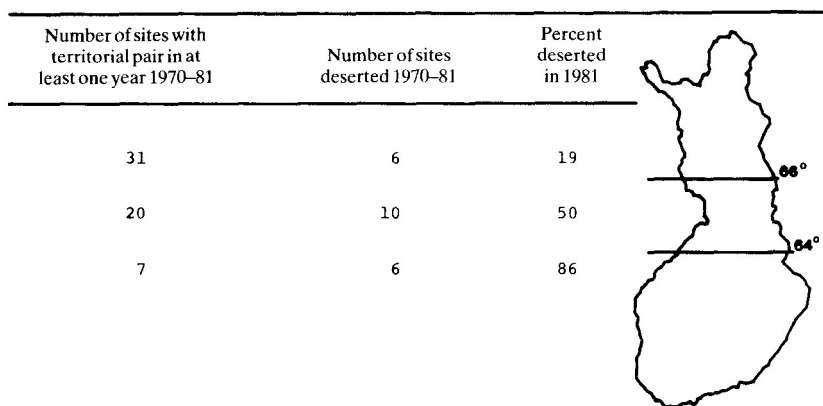


Figure 1: Distribution of nest sites occupied by pairs of Peregrines in different parts of Finland 1970-81.

(*Atlas of Finland* 1976). At present nearly 1000 bogs have been checked, but not all are suitable for Peregrines. Many have been drained for forestry, especially in the south, and others are now threatened by the expanding peat industry. It is difficult to assess the quality of a bog from the Peregrine's point of view. Nests are recorded on quite small ones, but generally it is the large ones that seem to be favoured. Large bogs usually include water, another feature liked by Peregrines. The actual nest site is sometimes on a small bog adjacent to a large bog or bog system providing suitable hunting terrain.

During the 1970s, territorial pairs were found on 53 bogs, and an additional three in stick nests on or near bogs. Two of these were Osprey (*Pandion haliaetus*) nests and the third was a Rough-legged Buzzard's (*Buteo lagopus*) nest. In all three cases, earlier nesting on the ground had occurred: at one site the nest was in a tree only in 1980; in 1978/79 and again in 1981 it was on the bog. The choice of the Osprey nest in 1980 may have been promoted by the snow conditions that year.

In addition to sites holding pairs, single falcons were seen on many other bogs. Whether all these birds were really single is open to question, as suitable nesting habitat was, in most cases, available nearby. Cliff-nesting was recorded at only two sites in the 1970s, and both were still active in 1981. However, crags have been neglected altogether in the census work, so more cliff-nesting pairs may remain to be found. The two known cliff sites are the northernmost known occupied sites in Finland. Other reports of cliff-nesting Peregrines have turned out to be Gyr Falcons (*F. rusticolus*), perhaps because most Finnish ornithologists now have little experience of either species. Both cliff sites occupied today have previously held Gyr Falcons.

BREEDING DISTRIBUTION

The present population is confined to two areas with rather few records in between. In these two areas some pairs nest quite close to each other. The shortest distance between two nests on different bogs was about five kilometres, and in one case two sites were occupied on the same bog only four kilometres apart. The birds were then well within sight of each other. Distances of ten kilometres

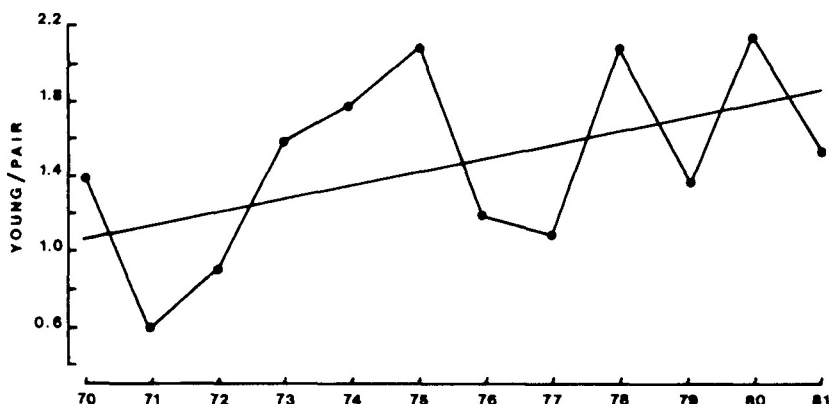


Figure 2: Reproductive rates of Finnish Peregrines 1970–81. The trend is calculated from three-year running averages ($r = 0.72$, $df = 8$, $P < 0.05$).

between nests are quite common. The number of sites occupied by pairs in 1970–81 for different regions are given in Figure 1. In spite of the small number of records, the more rapid decline in the south is clear. South of 64°N , there are records of only a few temporarily occupied sites and no young are known to have fledged since 1975. The area between 64 – 66°N holds a number of continuously occupied sites, although half of those known to have been occupied during the last decade are now deserted. Two sites have been reoccupied in this region; one in 1979, after having been deserted for at least 15 years, and another in 1981. In the northernmost part of Finland only 19 percent of the sites occupied in the 1970s have been deserted, and some territories have been newly established on bogs where no sign of previous occupancy was found. It is difficult to distinguish between truly new territories and alternative sites for falcons which have moved in from a nearby area.

The figures given here are based on the situation in 1981. Some of the sites reported to be deserted might well be found occupied in later years. Included in their number are three which were occupied in 1980. Movements within the same territories may occur from year to year. The longest known distance between two nest sites of the same pair is 8.5km, the two sites being separated by 30km² of suitable habitat. In another territory the falcons nested on three different bogs, although the distances involved were not great. Nevertheless it took five years to figure them all out. Thus one always has to balance the effort spent on each territory against the limited time available.

REPRODUCTIVE RATES

Finnish Peregrines show the reproductive anomalies typical for pesticide-contaminated falcons. Egg-shell thinning averages some 17 percent (Lindberg & Odsjö 1977), and the organochlorine contents of the few eggs analysed are quite high (Lindberg *et al.* 1983). Egg breakage seems to account for a large part of the losses.

Reproductive rates for the total known population in 1970–81 are given in Figure 2. Annual variation ranged from 0.6 to 2.1 young per territorial pair.

Table 1: Reproductive success in northern (+66°N) and southern (−66°N) Peregrines in Finland 1975–81.

	Northern (N)	Southern (N)
Clutch size	3.53 (68)	3.36 (25)
Brood size	2.46 (94)	1.97 (30)
Young/pair	1.91 (121)	1.16 (51)
Nonproductive pairs (%)	22	41

Variation in clutch size was small, and nest failure (often due to egg breakage) and failing eggs accounted for most of the large variation in reproductive output. We have few records of chick mortality and probably most successfully hatched young reached fledging age. Reproductive success improved in the latter half of the 1970s. For the trend I have evened out the annual variation by use of three-year running averages. The regression calculated on these figures was significantly positive ($r = 0.72$, $df = 8$, $P < 0.05$). Taken at face value, this implied an average annual improvement of 0.06 young/pair. The data were somewhat biased because southern territories (south of 66°N) were more heavily represented in the early 1970s, and these consistently produced fewer young than northern territories (*Table 1*, based on data for 1975–81 only). The southern fraction was inferior in every respect although the difference was significant only for the proportion of non-productive pairs ($\chi^2 = 6.35$, $P < 0.05$). This figure included non-breeding and early nest failures, as it was often impossible to distinguish between the two. On average, the total population produced 1.6 young/territorial pair in 1975–81; a figure that compared favourably with other stable and increasing populations (Ratcliffe 1980). The reproductive rates for the southern fraction were low (1.16), which probably accounted for the faster decline in this region.

POPULATION

Funding and manpower for census work were limited, thus only a fraction of the total number of even the very best potential nest sites was checked annually. Most sites occupied during the 1970s were checked every year, but additional bogs were chosen more or less at random. No systematic search of any area was made, leaving an inevitable gap in our knowledge. Up to 200 bogs per year were checked in 1975/76, falling to about 100 subsequently.

The number of territorial pairs found each year was higher than the figure in the previous year in 8 cases out of 11 (*Figure 3*). The peak in 1972 was due to greater effort that year, and the subsequent decrease in 1973/74 was caused by desertion of a number of the southern sites. Since then the effort was increased considerably in the northern regions and new pairs were discovered every year. The number of single Peregrines sighted varied greatly, but it was unclear whether the figures reflected any real variation in the proportion of unmated birds. Many of these reports came from people not directly associated with the census work.

These figures by no means prove an increase in the population: they merely show that our effort to find new occupied sites was successful. What is clear, however, is that few territories have been deserted since the mid-1970s and the general impression is that we do have more Peregrines now than ten years ago. There is no way of estimating population size from our census data, but I would guess a range of 40–50 pairs.

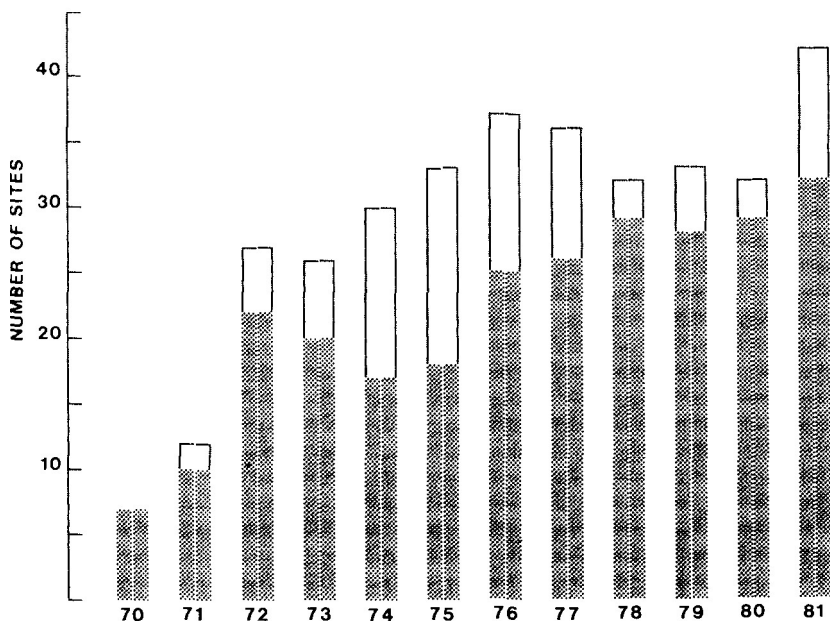


Figure 3: The number of nest sites known to be occupied by pairs of Peregrines (filled bars) and single birds (open bars) in Finland 1970–81.

DISCUSSION

Although we have little objective data to support the idea of a growing population, our method would certainly detect a decline. Some factors indicate at least a slight increase. The scanty data available on reproductive rates in the pre-DDT era give a clutch size of 3.3 with some 70 percent of the eggs producing young. Reproduction was not so good recently, but this might have been compensated by the population suffering less persecution than previously. The recovery rate of ringed Peregrines has dropped and there are now few reports of them being killed (Saurola 1977, and pers. comm.). Furthermore, birds seem to have been replaced rather quickly. We have no records of single Peregrines on a territory for several successive years.

By the present method our chances of detecting an increase at an early stage are small. Even a ten percent annual increase would go unnoticed for several years, as it would give only three or four new territories each year. We have no possibility of keeping track of a small increase with the hundreds of sites available. Going by rates of site occupancy is equally unsatisfactory in view of the movements between sites. There seems to be some room for optimism, however, even though our knowledge will always be a few years behind events.

ADDENDUM 1982

Only two weeks after the Thessaloniki conference, it became evident that I had

been too conservative in my estimate of the Peregrine population in Finland. By the end of the 1982 season I had received reports of 47 pairs fledging close to 100 young. Although only a few of these territories are indisputably of recent origin, I am left with the impression that the population is growing faster than anticipated. Since 1975 almost all nestlings have been ringed, but there is still a surprisingly high proportion of unmarked adults at large in the breeding population, suggesting that several territories remain still to be found.

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