

STATUS AND MONITORING OF THE PEREGRINE AND GYRFALCON IN THE KOLA PENINSULA, RUSSIA

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The paper summarises the results from the 1977–2003 field surveys carried out in the Murmansk Region and covering a significant part of the Kola Peninsula. Surveys in different parts of the region revealed the area of highest significance due to concentration of raptor populations. It is the lowland landscape in the upstream and midstream parts of the Ponoy River watershed, called the Ponoy Depression. This is where annual monitoring of breeding raptors was made. It turns out that the Ponoy watershed has retained the last stable Peregrine *Falco peregrinus* population in European Russia. Simultaneously, the Ponoy Depression proved to be a landscape suitable for Gyrfalcon *Falco rusticolus* breeding. Long-term monitoring of the raptor population (study area ca. 1000 km²) yielded data on the status of populations of the falcons and their breeding success in the Ponoy Depression. Throughout the study period, 18 locations ever occupied by breeding Peregrine pairs have been discovered in the Ponoy Depression. At the same time, total species abundance in the Murmansk region was estimated at 25–30 breeding pairs. The greatest number of territories occupied by the Peregrine in the Ponoy Depression was recorded in 1991 and 1994, and equaled 11. The population reached the highest productivity in 1996–1999. The Peregrine food range in the breeding season comprised over 30 prey species. The most frequently taken one was the Ruff *Philomachus pugnax*, 52%. Total Gyrfalcon abundance in the Murmansk Region was estimated at approximately 5–10 territorial pairs. A drastic decline in the Gyrfalcon abundance and instability of its breeding in the region have been observed, which seem to be related primarily to the very low level of the populations of the Willow Grouse *Lagopus lagopus* and other tetraonids *Tetraonidae* that has lasted for about 20 years. The most frequently taken prey for both the Peregrine and the Gyrfalcon nesting in the Ponoy Depression was the Ruff (43.2% in the food range).

Key words: Kola Peninsula, Peregrine, Gyrfalcon, population, distribution, monitoring, productivity, food range.

СОСТОЯНИЕ И МОНИТОРИНГ ПОПУЛЯЦИЙ САПСАНА И КРЕЧЕТА НА КОЛЬСКОМ ПОЛУОСТРОВЕ, РОССИЯ. Ганусевич С.А. Полевая исследовательская группа Кольского Севера, Москва, Россия.

В настоящей статье обобщены результаты полевых исследований, проведенных в 1977–2003 гг. в Мурманской области и охвативших значительную часть Кольского полуострова. Обследование различных частей региона позволило выявить территорию, наиболее значимую как место локализации популяций хищных птиц. Ей оказался низинный ландшафт бассейна верхнего и среднего течения р. Поной, именуемый Понойской депрессией, где и проводился ежегодный мониторинг состояния гнездовых группировок. Как выяснилось, в бассейне Поной сохранилась последняя для Европейской части России устойчивая популяция сапсана, одновременно с этим Понойская депрессия оказалась гнездопригодным ландшафтом для кречета. В результате многолетнего мониторинга населения хищных птиц (площадь обследуемой территории около 1000 м²) были получены данные о состоянии популяций соколов и успехе их гнездования в Понойской депрессии. За весь период наблюдений в Понойской депрессии было обнаружено 18 местообитаний, когда-либо занимаемых сапсанами для гнездования. В то же время общая численность вида в Мурманской области оценивалась в 25–30 гнездовых пар. Максимальное количество гнездовых территорий, занятых сапсаном в Понойской депрессии, было учтено в 1991 и 1994 гг. и составило 11. Наиболее высокая продуктивность популяции была достигнута в 1996–99 гг. Спектр питания сапсана в гнездовой период включал более 30 видов-жертв. Наиболее часто добываемым был турухтан *Philomachus pugnax*, 52%. Общая численность кречета в Мурманской области приблизительно оценена в 5–10 территориальных пар. Отмечено глубокое падение численности кречета и нестабильность его гнездования в регионе, очевидно в первую очередь связанные с крайне низким уровнем популяций белой куропатки *Lagopus lagopus* и других тетеревиных *Tetraonidae*, державшимся в период около 20 лет. Как и для сапсана, для кречета, гнездившегося в Понойской депрессии, наиболее частой жертвой был турухтан (43,2% в спектре питания).

Ключевые слова: Кольский полуостров, сапсан, кречет, популяция, распределение, мониторинг, продуктивность, спектр питания.

INTRODUCTION

At the same period of the 1950s and 1960s as many other species of raptors, the falcons' populations were critically declined in Europe and the Soviet Union by pesticides, contaminant chemicals, poisons and direct persecution by human (the last legally continued in the USSR until 1964).

North-European populations of the Peregrine Falcon *Falco peregrinus* were among those which the destroying impact of all above stated factors on migration routes and wintering ranges despite they had been occupying the most untouched and undisturbed nesting grounds. But even in remote northern areas Peregrines were continuing to be exposed to contaminants remaining closely related with migratory prey species. In the 1970s the outlawing of DDT commenced, and chemical residue in raptor eggs diminished significantly. Residue concentrations from eight eggs of Peregrine Falcon from the Kola Peninsula were reported by Henny et al. (1994). Peregrines from the study area were shown to have relatively high levels of contaminants, and further satellite telemetry study of migration pathways and wintering localities were conducted in order to map areas where these Peregrines might be exposed to contaminants (Henny et al. 2000). More detailed analyses of movements and winter ranging of migratory Peregrines breeding in far northern European Russia are presented by Ganusevich et al. (2004).

Gyrfalcons *Falco rusticolus*, inhabiting for most of the year their arctic home range and feeding on native prey species, have not shown similar declines as Peregrines exposed to pesticides and other contaminants year round. No eggshell thinning or related reproductive failures have been observed in Gyrfalcons, but local breeding populations fluctuate in numbers between years with their prey species – a common phenomenon in the Arctic (Burnham & Mattox 1984).

Isakov (1982) considered the Kola Peninsula to be among the regions with quite well studied avifauna due to a lot of bird surveys carried out basically in the Lapland and Kandalaksha Reserves. But none of them covered the eastern interior of the peninsula. Until wider ornithological surveys of the Kola Peninsula were commenced in 1976 organized by the Geographical Society of the USSR, very little data on the falcons could be found to estimate the status of their populations.

Wider surveys had suggested that the Kola Peninsula – the eastern part of the Murmansk Region – was a unique terrain for the field study of migratory raptors, for related long-term biological study, and possibly for special conservation measures. Early field surveys (from 1977) to various locations identified the wetlands of the middle reaches of the river Ponoy and its wetlands, hereafter referred to as the Ponoy Depression, as a main habitat for raptors, and consequently further surveys followed.

The eastern interior of the Kola Peninsula was thought to hold the last significant population of the Peregrine Falcon in European Russia and to provide suitable habitats for Gyrfalcons discovered as nesting in the same area.

STUDY AREA

The location of the fieldwork summarised in this report is the northwestern corner of the Russian Federation: Murmansk Region, known historically as Russian Lapland. Together with Sweden, Norway and Finland, this area belongs to a land mass named Fennoscandia. Murmansk Region is situated almost entirely north of the Arctic Circle, occupying a total area of nearly 145,000 km², of which the mainland and islands occupy 56,000 km², and the Kola Peninsula 89,000 km². The region extends 390 km from north to south (N70° to N66°) and about 550 km east to west (E28° to E41°). The north and east of the region is bordered by the Barents Sea, part of the south by the White Sea. The western land borders are contiguous with (north to south) Norway, Finland, and Republic of Karelia. The eastern, peninsular part of the region (the Kola Peninsula) is almost separated from the mainland by a series of north-south fissures including the Kola Gulf in the north and Lake Imandra towards the south.

The character of the entire region's terrain is generally described as tundra in the north, changing through forest tundra to taiga (boreal forest) in the south. A dividing line in this respect can be drawn approximately diagonally from the northwest to the southeast of the Region.

Our surveys have been generally concentrated on peninsular part of the Murmansk Region which was supposed to include well-preserved and diverse wilderness areas inaccessible by road and uninhabited by humans, perhaps unique in Northern Europe.

An area discovered as the most important for both species is situated in the wetlands basin of the middle course of the Ponoy River, currently known as the Ponoy Depression. It is characterized by abundance of prey species (primarily shorebirds associated with bogs and lakes), suitable nesting sites (cliffs and rocks), and low human activity, was chosen as the main survey area. The area has provided unique 'wilderness' conditions and a model terrain for long-term study. A typical habitat of nesting Peregrines and Gyrfalcons in the Ponoy Depression is shown in fig. 1.

MATERIAL AND METHODS

Although this report mostly concerns the Kola Peninsula, and is respectively titled, we add all available data which were obtained in other areas of the Murmansk Region or available from other researchers in order to make estimation on population status of the species more representative for the region.

Our survey work in the Murmansk Region began in 1977 in the area later coined as the Ponoy Depression Survey Area. This location was surveyed every breeding season from the very beginning, other areas in which our research was carried out are mapped in fig. 2.



Figure 1. Nesting habitat of Peregrines and Gyrfalcons in the Ponoy Depression.

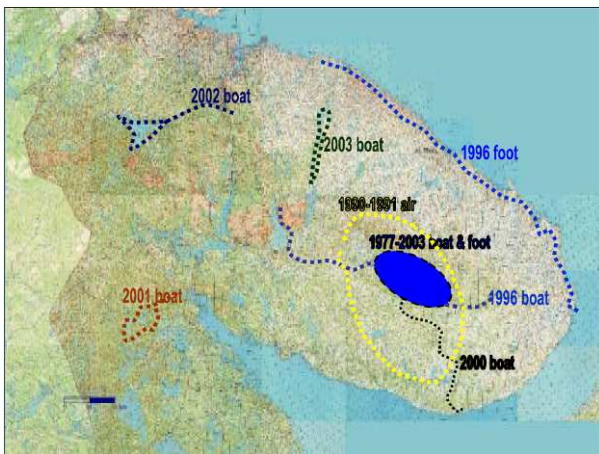


Figure 2. Areas, routes and years of raptor surveys conducted by the author in the Murmansk Region.

We used boat transportation where feasible and available, but basic material was collected by long-distance investigations by foot which was the only possible way in the absence of roads or waterways. We tried to check as many nest sites already located as possible to determine occupancy and productivity, and to do additional searches for new ones. During the whole period of the study we have had only two possibilities to make careful air inspection of potential nesting habitats of Peregrines and Gyrfalcons in the eastern interior of the Peninsula.

By local monitoring of a selected 1000 km² area within the Ponoy Depression we managed to reach conclusions about the status and breeding success of the falcon populations there.

PEREGRINE POPULATION

Distribution

In 1976, the first two nesting pairs were discovered by K. Mikhailov and A. Fil'chagov (pers. comm.) in the area later coined as the Ponoy Depression Survey Area. Previously there had been no data on locations of nesting Peregrines in the Murmansk Region; the only finding was described in the Kandalaksha Gulf (Bianki 1960).

Early in our survey, the eastern interior of the Peninsula was suspected to hold the last significant population of the Peregrine Falcon in European Russia. Further wider and long-term investigations could confirm this. Only isolated nesting sites existed elsewhere.

Initial estimation of Peregrine population status in the Kola Peninsula based on investigations conducted by expeditions of the Geographical Society in 1977–1980 is found in Ganusevich (1988).

For the population of the Peregrine Falcon locally distributed in the Ponoy Depression, we currently know 18 locations in the survey period occupied by breeding pairs. Other nest sites known occupied in the last few years are mapped in fig. 3.

An estimation of the total number of Peregrines nesting in the Murmansk Region is between 25 and 30 pairs. The estimation is given roughly since the Peregrine population has been the only one locally monitored and still in need of a much wider survey.

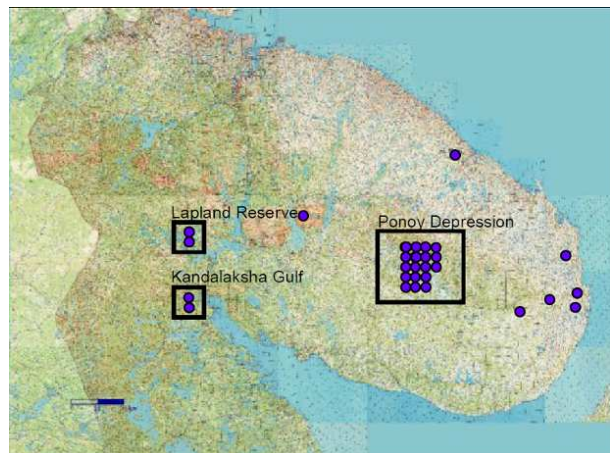


Figure 3. Distribution of Peregrine Falcon nest sites currently known in the Kola Peninsula.

Note: Locations were provided for the Lapland Reserve by A. Gilyazov (pers. comm.), for the Kandalaksha Gulf by I. Kharitonova (pers. comm.), for Lovozero and downstream of the River Ponoy by I. Vdovin (pers. comm.).

Peregrine productivity

The number of known Peregrine Falcon nesting territories in the Ponoy Depression increased during the early years of investigation (Ganusevich 1988) due to a better knowledge of the region and habitat requirements. A history of these discoveries is shown in fig. 4. Since 1996, all suitable nesting locations of

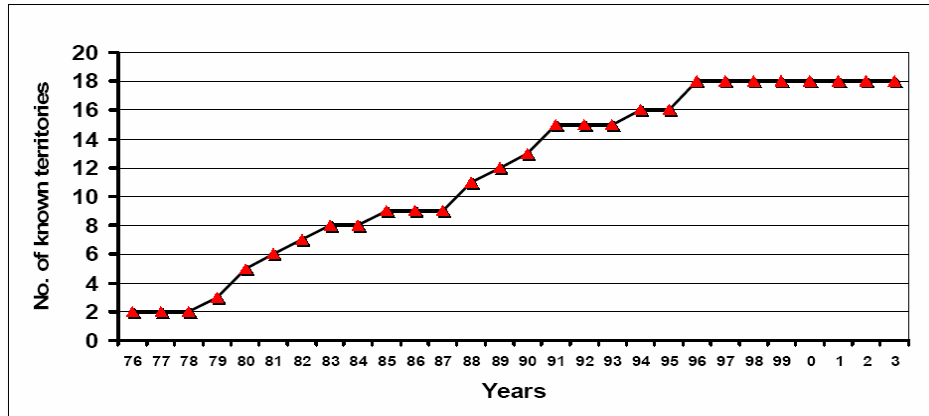


Figure 4. The number of the Peregrine nest territories discovered in the Ponoy Depression Survey Area, since 1976.

Peregrines in the Ponoy Depression Survey Area are supposed to be completely known. By this time the 1000 km² study area was believed to be surveyed adequately.

Since 1986 (except 1997), not less than half of all suitable nesting territories have been annually checked in order to monitor occupancy (fig. 5) and productivity (fig. 6). The maximum number of occupied territories was eleven in 1991 and 1994. The highest productivity of the population was achieved in 1996–1999. Both clutch and brood size almost doubled. In 2001, we could observe a nest with a successful brood of five nestlings (fig. 7),

while two years later in the same nest a five-egg clutch was found as failed (fig. 8). The eggs were opened, and in all of them dead embryos were found at different stages of development. It looked as an evidence of contamination but still has to be tested. Another threat to success of nesting Peregrines is easy access to many nests by predatory mammals.

Prey species

Food remains from the eyries and their vicinity were used to evaluate prey species eaten by Peregrine Falcons. The diet consists of more than 30 prey species (fig. 9). The most frequently found is Ruff *Philomachus pygna*, 52%, which is a migratory species and a very possible source of Peregrine's contamination.

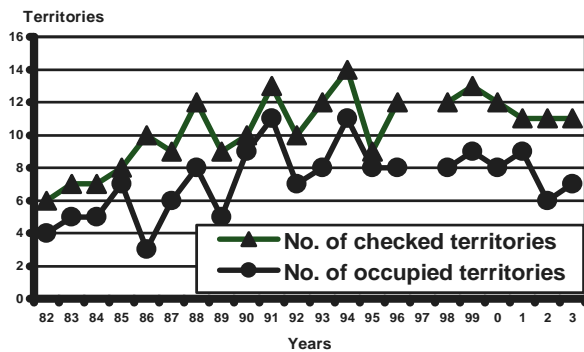


Figure 5. Monitoring of the Peregrine population status in the Ponoy Depression, 1976–2003.

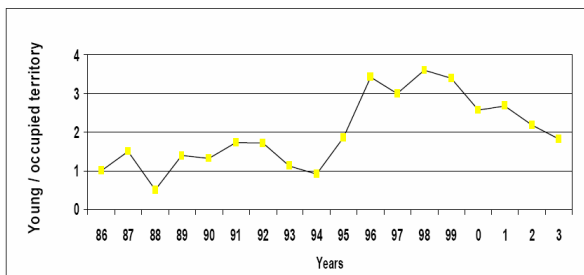


Figure 6. Monitoring of the Peregrine population productivity in the Ponoy Depression, 1986–2003.

GYRFALCON POPULATION

Distribution

Before the Kola Peninsula ornithological survey project by the Geographical Society was started in 1976, most of the region had not been inspected at all, and the only areas mentioned as Gyrfalcon nesting habitats were the coast of the Barents Sea, including the Seven Islands Archipelago, and the Lapland Reserve (Ganusevich 1988). As a result of investigations carried out in 1977–1986 new nesting locations of the Gyrfalcon were discovered near the mouth of the River Ponoy and in the Ponoy Depression. All available data on the species nest sites distribution are summarized in fig. 10. The timing of nesting attempts which have been observed in these locations (table 1) regrettably demonstrates that the status of the Gyrfalcon population in the region can be currently considered mostly from the historical perspective.

Nevertheless, the present status of the species population in the Murmansk Region can be approximately estimated to be 5–10 territorial pairs, the estimate based on some very fresh information obtained from observers as personal comments.



Figure 7. Five-nestling successful brood of the Peregrine Falcon.



Figure 8. Five-egg failed clutch of the Peregrine Falcon.

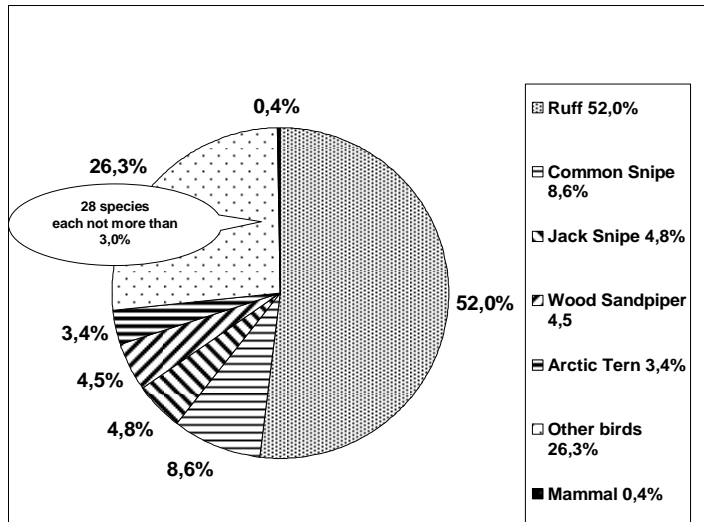


Figure 9. Diet of the Peregrines nesting in the Ponoy Depression. The number of prey items is 269.

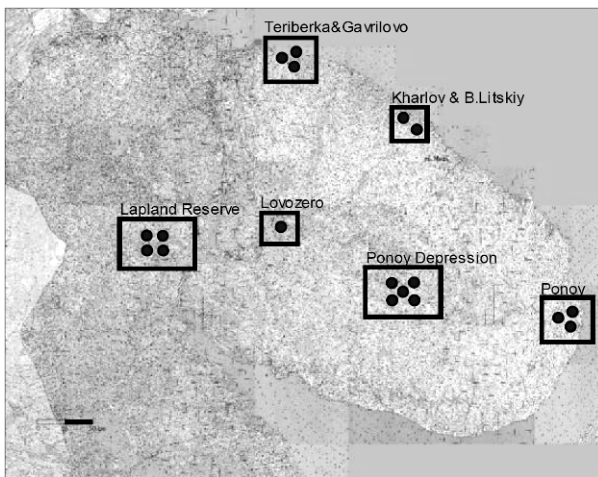


Figure 10. Distribution of the Gyrfalcon nest sites known in the Kola Peninsula (including the Lapland Reserve).

Table 1. Known observations of Gyrfalcon nesting attempts.

Areas	Number of nest sites	Years	Authors
Teriberka & Gavrilovo	3	1955–1956	Kishchinskiy
Kharlov & B. Litskiy	2	1941, 1976–1978	Shklyarevich, Krasnov
Lapland Reserve	4	1938, 1975, 1986	Semyonov-Tyan-Shansky, Gilyazov
Lovozero	1	1993	Hunting, Committee
Ponoy Depression	5	1977–1986	Ganushevich
Ponoy	3	1977–1979	Fil'chagov et al.

Gyrfalcon productivity

Table 1 shows that Gyrfalcons have nested in the region very irregularly. Very deep decline of the Gyrfalcon population and instability evidently links with the former decline and very low level of the Willow Ptarmigan *Lagopus lagopus* population (and other *Tetraonidae*) that has lasted for a period of about 20 years. The most recent observations concerning Willow Ptarmigan winter density obtained from local people of the eastern interior of the peninsula, together with findings of Gyrfalcon active nests, will hopefully make positive impact on restoration of the falcon population in the region.

Prey species

An estimation of the diet of the Gyrfalcon nesting in the Ponoy Depression shows (fig. 11) that, like for the Peregrine, the most common prey species is the Ruff *Philomachus pygnae*, 43.2%. This migratory species is the most abundant in the area from late spring through summer, but in early spring, which is the most crucial time for nesting Gyrfalcons, the Ruff is not available to serve as a substitute for the Ptarmigan.

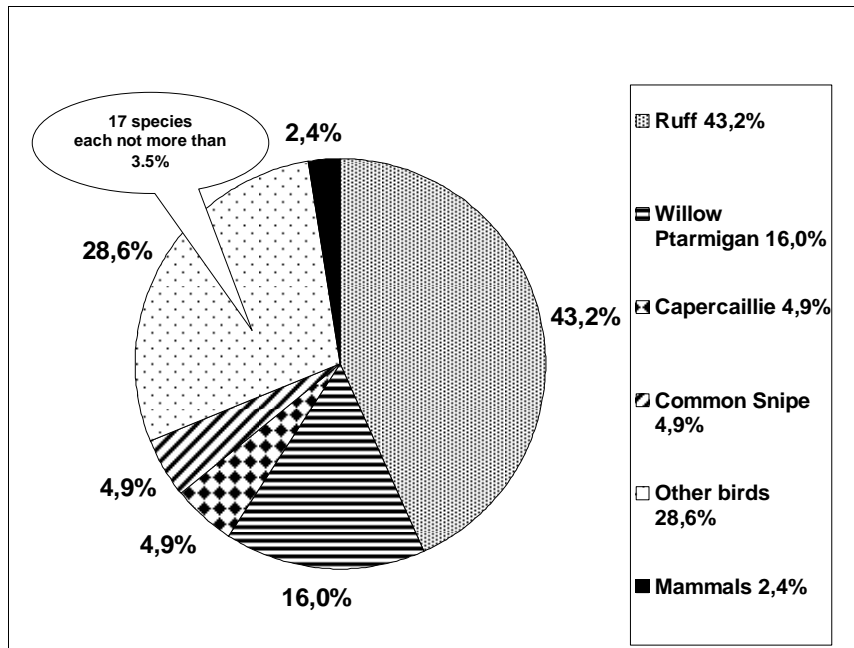


Figure 11. Diet of Gyrfalcons nesting in the Ponoy Depression. The number of prey items is 206.

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