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Wolves *Canis lupus* in southeastern Norway

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From November 1980 to May 1984, the Directorate for Wildlife and Freshwater Fish, Game Research Division has collected 285 reports of wolves *Canis lupus* in southeastern Norway. 64 reports have been verified as wolf, 69 have been rejected as non-wolf and 152 are unsolved. The main range for wolves in southeastern Norway was situated east of the river Glomma in Hedmark county. Wolves regularly crossed the border between Sweden and Norway, and the population is considered common to the two countries. Although it is difficult to draw any conclusions as to the total number of wolves within the study area, a minimum of three solitary adults was estimated in the first years of the study. Five wolves were the maximum number verified simultaneously in southeastern Norway.

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INTRODUCTION

The present wolf population in southeastern Norway has an obscure history. A single wolf was shot here in 1964 (Myrberget 1978), and another specimen was shot in Sweden, close to the southeastern Norwegian border, in 1965 (Haglund 1968). Shortly after the wolf was protected by law in both countries, in Sweden in 1965 and in Norway in 1971. No wolves are known to have been killed in southeastern Norway or neighbouring areas in the period 1965—1980. During this period the wolf was reported in some papers as virtually extinct in Scandinavia (Pimlott 1975, Zimen and Boitani 1979). At the same time, however, local observers claimed that the species still existed in southeastern Norway after 1965, and Norwegian reports suggested a population of 6—12 wolves in 1976 (Myrberget 1978, Granberg 1981).

A monitoring study of wolves in southeastern Norway was started by the Norwegian Directorate for Wildlife and Freshwater Fish in 1980. The primary objectives of this project were investigations of wolf abundance, population structure and distribution (Wabakken et al. 1982). The project is coordinated with a similar study, conducted in the adjoining parts of Sweden by A. Bjärvall. The present paper is a report on some preliminary results of the wolf project.

STUDY AREA

The study area includes four counties in southeastern Norway: Hedmark, Oppland, Akershus and Østfold. The total land area, 59000 km^2, consists of 35% mountainous terrain above the timber line, 5% farmland and 0.4% inhabited area. The predominant vegetation in the remaining area is coniferous forest, *Pinus silvestris* and *Picea abies*, as well as to a lesser extent birch forest *Betula pubescens* (Statistisk Sentralbyrå 1978). Moose *Alces alces*, reindeer *Rangifer tarandus* and roe deer *Capreolus capreolus* are abundant, while red deer *Cervus elaphus* is found only locally in the study area. Beaver *Castor fiber* is also locally abundant. Domestic reindeer are kept by Lapps in the northeastern parts of the region, while approximately 250 000 domestic sheep *Ovis aries* graze in outlying fields throughout the study area.

MATERIAL AND METHODS

As the study area is vast and the available research funds limited, the study was dependent upon occasional reports of possible wolf sightings, howling, tracks or prey remains. A total of 285 wolf reports have been collected from 1 November 1980 to 1 May 1984. Due to the informants' general lack of taxonomical and ethological training, these reports could, however, not be accepted at face value, and most of them were therefore checked in the field by the project personnel. During the winter season when the ground was covered by snow, wolf tracks were checked and retraced by project personnel following the tracks on skis as far as possible

(use of off-road motorized vehicles is prohibited in Norway). A total distance of approximately 210 km of wolf tracks has been traced. The minimum population size estimate is based upon field controlled wolf observations from different localities at the same time. Footprint size was used on one occasion in order to differentiate between two individuals. Sex determination of tracked individuals was based on occurrence of vaginal bleeding and observations of urination behaviour.

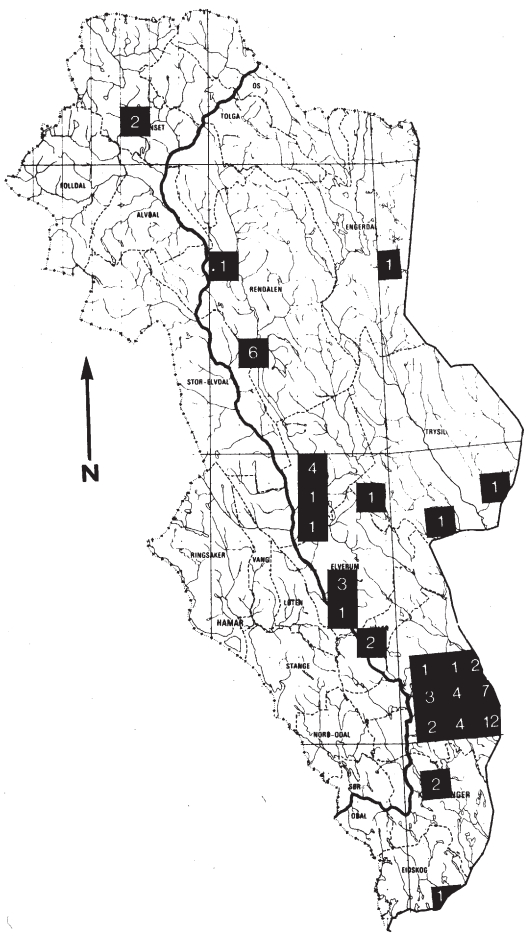
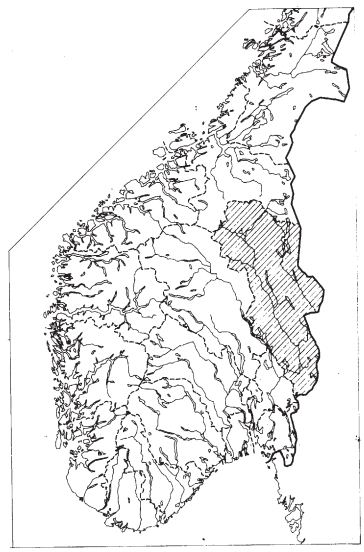


Fig. 1. Confirmed wolf reports from Hedmark county, Southeastern Norway from 1. Nov. 1980 to 1. May 1984. The reports are plotted in dark shaded 10 x 10 km squares in accordance with the UTM-system. White figures refer to numbers of confirmed wolf reports.



RESULTS AND DISCUSSION

Of the 285 wolf reports, 64 have been identified as wolf and 152 are unsolved; 69 have been rejected as non-wolf and attributed to other species. Footprints of European lynx *Lynx lynx,* domestic dog *Canis familiaris* and red fox *Vulpes vulpes* were the ones most frequently confused with footprints of wolves. Observations have been reported from 19 different municipalities in Hedmark county, three in Akershus, two in Østfold and four in Oppland, but all the accepted wolf reports, and 95,5 % of the total number of reports, stem from Hedmark county. Verified wolf reports are shown in Figure 1. Hedmark is divided into two parts by the river Glomma. All earlier verified wolf reports have been east of the river, but on 16th of April 1984 the first wolf observation west of the Glomma was documented. Wolves in the east of the study area crossed the Norwegian-Swedish border regularly, and the population should be considered to be common to the two countries.

The verified wolf reports indicate that wolves prefer lowland, coniferous forest, sparsely inhabited by humans. Animals stalked by wolves have accordingly been typical species for such habitat. Two moose calves and five roe deer have been found killed by wolves. Unsuccessful hunting of moose, chasing of red fox and active stalking of beaver have also been recorded and verified. Reindeer (occurring primarily above

the timberline) have not been reported in connection with wolf tracks.

A minimum population size of three wolves has been determined from observations in the winter of 1980/81 (Wabakken et al. 1982). In the winter of 1981/82 two different individuals were identified within the Norwegian study area. A third wolf was tracked simultaneously in the Swedish area a few kilometers away (Bjärvall and Isakson 1983). This third one was a male (Bjärvall and Isakson op. cit.) and one of the other two wolves was a female. All verified reports referred to solitary individuals.

Only two wolves were verified in the winter of 1982/83. They now travelled together continuously throughout the winter on both sides of the Norwegian-Swedish border. This was a pair, and a litter of pups was born in spring 1983, probably on the Swedish side of the border (Bjärvall and Isakson pers. comm., Wabakken unpubl.). In the same Swedish area a pack of eight wolves was determined in the winter of 1983/84 (Wabakken 1984). Several times during this winter some of these wolves crossed the border and on one occasion a minimum of five wolves was identified in southeastern Norway. Those five were the maximum number of wolves verified simultaneously in southeastern Norway in the study period.

The given figures should not be considered as absolute wolf numbers within the study area. Although the number of wolves obviously is fairly small, the exact number may be higher than the verified one for a variety of reasons. Our minimum estimates are based upon simultaneous wolf observations from different localities. But it seems very unlikely that all members of the population should expose themselves to observation at the same time. When feeding at moose or roe deer kills, solitary wolves may stay for weeks inside a small patch of a few square kilometers. Such wolves can be difficult to detect when these patches are located in vast areas without human settlement or human activity at the moment. Footprints of wolves are often mistaken for footprints of other species, and they were often overlooked especially when mingled with moose tracks. To what degree all observations of wolves really were reported to the project is another important uncertainty factor. The experiences from the winter of 1981/82 illustrate the difficulties in the determination of wolf numbers in the area. As previously mentioned a minimum of three solitary individuals were estimated this winter, but none of these wolves were reported to either the Swedish (Bjärvall and Isakson pers. comm.) or the Norwegian wolf project before mid February. A more comprehensive discussion of factors limiting wolf reports to the project is available in Wabakken et al. (1982).

To serve future management needs of accurate data on population size and range of the southeastern Norway or central Scandinavian wolf population, continued research is required. This particular wolf population is living in the areas of Scandinavia where the species may have a fair chance of survival. Sheep and especially reindeer husbandry may make survival difficult in most other districts. This fact makes wolf management in southeastern Norway and the neighbouring Swedish regions rather important with regard to future preservation policy (Haglund 1975, Myrberget 1978).

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