

Otter (*Lutra lutra*) population in northernmost Finland

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Abstract. The otter population in northernmost Finland (total study area 95 000 km²) was studied by snow-tracking in 2004–2008. Data on otter tracks were mainly collected in winter using snow-mobiles. A more intensive one-visit census method was used in one area. A total of 792 tracks of otters were found all over Finnish Lapland. Otters were more common in the southern than in the northernmost, alpine, part of the study area. In the strict one-visit census area 15 otters were found, which corresponds to approximately 30 otters living in the area. Extrapolation of these results suggests that there are about 450–500 otters in Finnish Lapland.

Key words: *Lutra lutra*, census, snow-tracking, Finnish Lapland.

INTRODUCTION

The distributional range size of otter (*Lutra lutra* L.) populations has increased in many areas during the last years (e.g. Kranz et al., 2007; Sulkava & Liukko, 2007a). The current distribution of otter in Europe is quite well known. However, the population biology and distributional range of the northernmost otters in Europe are poorly investigated. We have little knowledge about the abundance of otters in these areas, and especially the density of the populations is hardly known at all (Sulkava et al., 2007).

In this study the population of otters in the northernmost part of Finland was investigated by snow-tracking. The aim was to clarify the possible northern limits of the distributional range of otters in Finland, and to study the abundance and densities of otter populations in these northernmost areas.

STUDY AREA AND METHODS

The study area, mostly between the Arctic Circle and latitude 70 N, is situated in the northernmost part of Finland, called Finnish Lapland (Fig. 1). The total study area is about 95 000 km². The southern part of the area is in the boreal zone,

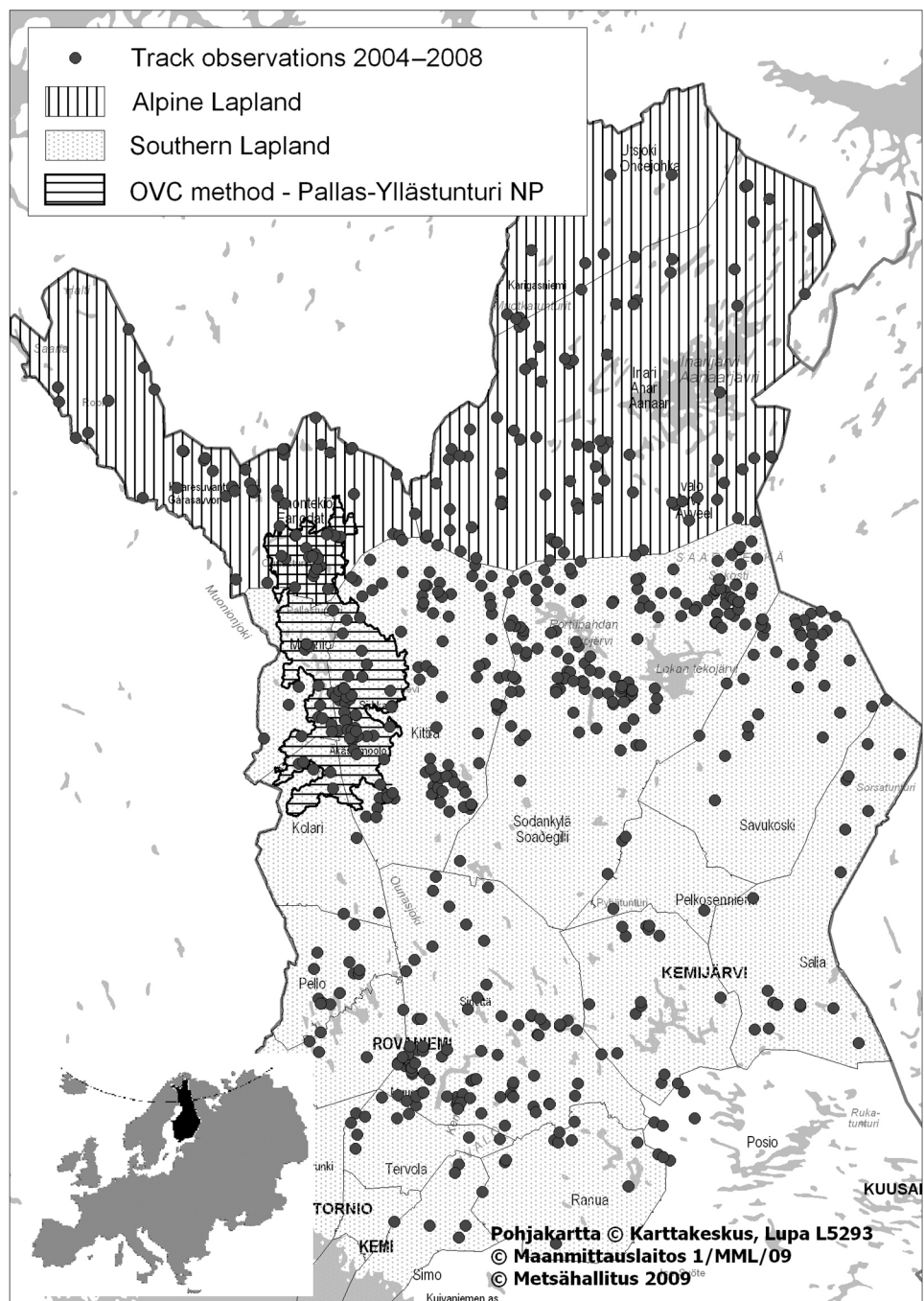


Fig. 1. The study area and all observations of otter tracks in Finnish Lapland 2004–2008.

dominated by coniferous forests. The northernmost part is in the alpine zone, where the thermal growing season is less than 115 days. In this area near the real tundra zone only a few trees can exist.

The otter population in Finnish Lapland was studied during four winters (2004/05–2007/08) by snow-tracking. In one smaller area around Pallas-Yllästunturi National park, the so-called one-visit census method (OVC) was used. The method was tested and used earlier in central Finland (Sulkava, 2007; Sulkava & Liukko, 2007b). In this investigation the aim was to find the known proportion of all otters living in that particular area. When the abundance of otters in areas around the OVC-study area is known, it is also possible to estimate the number of otters over larger areas (Sulkava, 2006, 2007; Sulkava & Liukko, 2007b). Different kinds of snow-tracking methods were compared and described earlier (Sulkava, 2007).

The main data (outside the OVC-area) were collected by the field workers of Natural Heritage Services simultaneously with snow-tracking studies of big carnivores (*Canis lupus*, *Gulo gulo*, and *Lynx lynx*), searching nests of golden eagles (*Aquila chrysaetos*), and controlling hunting and other activities in the wilderness. All fieldwork was done by snowmobile during the time when snow and ice totally covered the landscape. In winter, all animal tracks in the snow are easy to find and quite easy to identify.

In the four study winters, a total of 137 486 km was searched for animal tracks. All the tracks were placed on maps by the GPS-positioning system.

In Pallas-Yllästunturi National Park, 141 sites were carefully studied by means of the OVC method. A total of 606 km was travelled in the area by either snowmobile or car. All the sites were situated on riverbanks and other possible sites for otters (see more about the OVC method in Sulkava, 2007; Sulkava & Liukko, 2007b). The total OVC-study area was 4146 km², and there are about 1700 km of rivers and streamlets in the area.

Differences between observation indexes of otters were studied by the Kruskal–Wallis test. Three areas were excluded because of only a few kilometres had been snow-tracked.

RESULTS

In the four study years a total of 792 tracks of otters were found in the entire study area (Fig. 1). The otter tracks were more common in the southern part than in the northernmost, alpine, part of the study area (Chi-square = 4.34, $df = 1$, sig. = 0.037). In the alpine area, the otter tracks were found 2.6 times per 1000 km (total 202 times and 76 783 km). In the southern, boreal zone of Lapland, tracks were found 6.4 times per 1000 km (388 times and 60 703 km) (Fig. 2).

In the strict OVC in the Pallas-Yllästunturi NP area 46 otter tracks were found for the total of 141 study sites (33% of the sites were positive). Of the tracks 29 were fresh and 17 old (tracks were identified as old when an animal had visited the site earlier than within the last 3 days). These tracks were estimated to represent

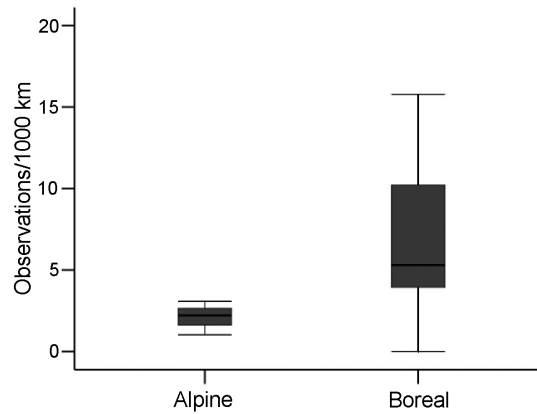


Fig. 2. Differences for the numbers of otter tracks between the boreal and the alpine area in Finnish Lapland (Chi-square = 4.34, $dF = 1$, sig. = 0.037).

15 individuals. On the basis of studies from central Finland (Sulkava, 2006; Sulkava & Liukko, 2007b) this corresponds to approximately 30 otters living in the Pallas area during the time of the study (0.7 individuals/100 km², or 0.2 individuals/10 km of river) (Fig. 3).

The number of otter track observations was at about the same level inside the OVC area and about half of the total study area around it. In another half of the total study area (alpine zone and the northernmost part of the boreal zone) the number was smaller. Extrapolation in the density of otter population outside the OVC area was performed based on the density of track observations. In boreal Finnish Lapland about 48 000 km² was populated at the same level as the OVC area with about 300–400 otters ($0.0072 \text{ ind./km}^2 \times 48\,000 \text{ km}^2 = 345$) living there. In the other half of the study area, the number of otters is about 100–150 ($(345/6.4) \times (x/2.6)$). The total number of otters in the whole of Finnish Lapland is about 450–500.

DISCUSSION

Our results show that the distribution range of otter covers the whole area of Finnish Lapland. However, the population was sparse in the northernmost areas, where the winter conditions are the harshest. In these alpine areas all the waters are totally covered with ice in winter. Possible unfrozen feeding areas in winter-time are the limiting factor for the population of otters (Sulkava, 2006; Sulkava et al., 2007). In the conditions of alpine Lapland, it is nearly impossible for otters to find any food in winter.

The density of otters in the Pallas area (0.7 individuals/100 km² or 0.2 individuals/10 km of river) was less than a fourth of the densities of otters in

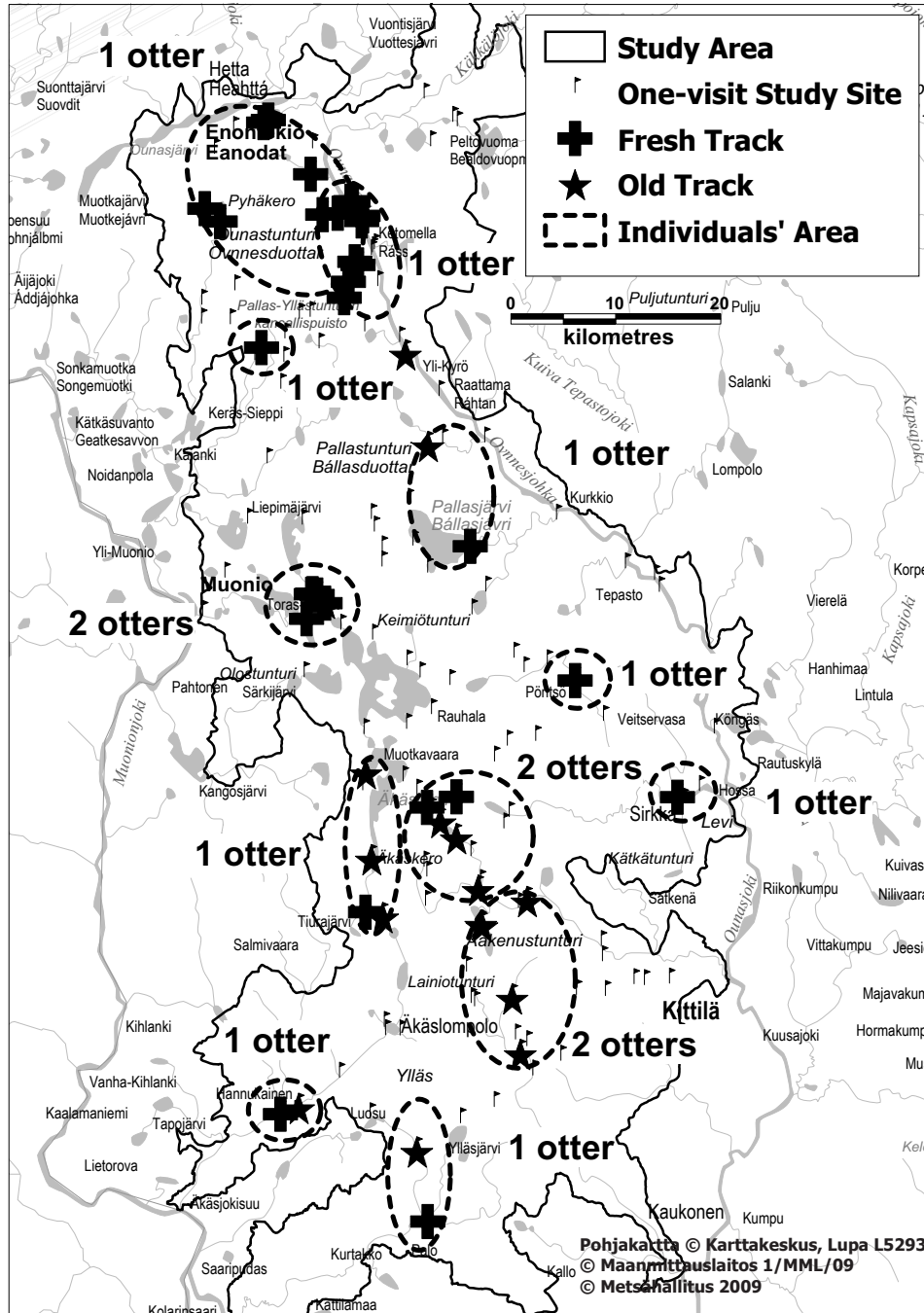


Fig. 3. Tracks and individuals of otters found in the OVC study in the Pallas-Yllästunturi NP area.

other boreal areas studied like in central Finland (3.2 individuals/100 km² or 0.7/10 km) (Sulkava, 2006), Scotland (0.7/10 km) (Kruuk et al., 1993), or in Russian Karelia (0.6–1.3/10 km) (Tumanov, 2002). However, all these other areas are situated in more southern regions. No studies north of the Arctic Circle had been done earlier. Results from the Finnish wildlife triangle monitoring scheme (Linden et al., 1996) support our results (RKTL, 2008).

In the more southern region, in central Finland, the otter population was saturated at the local carrying capacity in the density of 3.2 individuals/100 km² (Sulkava, 2006; Sulkava et al., 2007). Although the density of otters in the Pallas area was much lower than the density in central Finland, it could be possible that the level of the otter population in most of Finnish Lapland is as high as it could be in these climatic conditions.

Our estimation of the number of otters in Finnish Lapland, about 450–500 individuals, is most probably at a correct level. In 1995–1998 the number of otters in Finland was estimated to be about 2000–2550 individuals (Sulkava & Liukko, 2007b). Otters were most abundant in the central part of Finland, but the populations were low in coastal areas and in Lapland (Sulkava & Liukko, 2007a). After that, the otter populations have increased in the coastal areas in south Finland, but stay at the same level in central Finland (Sulkava, 2006, and unpublished data; RKTL, 2008). The studied area of Finnish Lapland is nearly one third of the total area of Finland, and the estimated number of otters is at an expected level.

In the future, areas north of the Arctic Circle could become more suitable for otters as a result of climate change. However, in arctic areas many toxic chemicals could be a problem for the animals that live at a top of the food chain. For these reasons, the monitoring of the otter population in northern areas is important.

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Saarma (*Lutra lutra*) populatsioon Soome Lapimaal

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Uuriti saarma populatsiooni arvukust lumele jäetud jälgede põhjal Soome Lapiimaal (kogu uurimisala pindala oli 95 000 km²) aastail 2004–2008. Suurem osa saarma jälgi leiti talvel lumekulguritega liikudes. Lisaks kasutati ühes piirkonnas intensiivsemat “ühe visiidi loendust”. Kokku leiti 792 jäljerida üle kogu Soome Lapimaa. Neid oli rohkem uurimisala lõunaosas kui selle põhjapoolsemas, alpiinises osas. “Ühe visiidi loenduse” piirkonnas leiti 15 saarmast, mis vastab umbes 30 saarma esinemisele sellel alal. Tulemuste põhjal võib järeldada, et Soome Lapiimaal elab umbes 450–500 saarmast.