

REPORT

MONITORING PERIPHERAL POPULATIONS OF THE EURASIAN OTTER (*Lutra lutra*) IN SOUTHERN ITALY: NEW OCCURRENCES IN THE SILA NATIONAL PARK

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Abstract: After a period of strong decline, the Eurasian otter (*Lutra lutra*) has re-expanded its area of distribution in Italy from 1984 to 2004, mainly toward the southern periphery of its range. The Sila National Park is located in a strategic position along a drainage divide separating southern peripheral otter populations from unoccupied but potentially recolonizable habitats. A research project aimed to evaluate the aquatic habitats of the Sila National Park for otter recolonization is now in progress. At present, we have surveyed 14 sampling sites to detect otter presence in the study area. Two positive sites were found on the Arvo river. These records represent the first evidence of otter presence in the Sila area after extinction apparently occurred in the late 1970s. One of the two positive sites was negative in the 2003. These data seem to indicate that otter recolonization in the southern periphery of Italian distribution range is still in progress. Management actions in the Sila National Park may favour recolonization processes.

Keywords: Eurasian otter; false absences; Southern Italy; recolonization; Standard survey

INTRODUCTION

In Italy, the distribution of otter (*Lutra lutra*) has been restricted mainly to the southern regions of the peninsula since 1984 (Cassola, 1986). The species has been listed nationally as 'critically endangered' (Calvario and Sarrocco, 1997). From 1984 to 2004 Italian otters have re-expanded their distribution, recolonizing previously unfavourable habitat, mainly toward the southern periphery of their former range (Marcelli and Fusillo, in press). During the 2002–2004 Southern Italy survey we detected new otter occurrences in the Savuto, Neto and Crocchio river basins within the Calabria region. These locations designed the recent southern edge of the otter range in Italy (Marcelli and Fusillo, in press). Otter occurrences at the southern edge were strongly discontinuous in the space. Moreover, annual and monthly repeated surveys in some locations of this peripheral area have revealed variable results (Marcelli, 2006; authors' unpublished data), probably due to local extinction/colonization dynamics or false absences. Local extinctions and colonizations occurring on a short time scale are expected because of low habitat quality at the range edges of a species and source-sink dynamics (Pulliam, 1988; Brown et al., 1996). The incidence of false absences during standard otter surveys (Reuther et al., 2000) at the range edges may be due to low density of otters. Low otter density may translate into low spraint (otter faeces) density and, as a consequence, in low detectability during standard surveys.

Monitoring otter occupancy and distribution dynamics at range edges is essential, especially in protected areas, as a basis for conservation actions aimed to favour recolonization processes. However, low otter detectability in peripheral areas may reduce the effectiveness of standard surveys. A possible way to deal with imperfect detection of species is to increase sampling effort by multiple visits at sampling units within a defined sampling season (MacKenzie, 2005).

The Sila National Park (SNP) is a protected area located in the southern edge of the Italian otter range (Fig. 1). Its territory is included in an extensive mountainous plateau (Sila Massif). Small streams with oligotrophic conditions flow from the Sila upland to lowlands surrounding the Park. A drainage divide along the major dimension of the Park separates the western Crati and Savuto rivers where otter occurrence was respectively 46.7% and 80.0% (Fusillo et al., 2003), from the eastern Neto river and other small rivers with sporadic or without otter presence (Fig. 1). Dam construction in the 1920s formed three large lakes along the drainage divide. The Sila lakes have apparently available fish resources and could be an important habitat for otters. However, no information exists about otter presence in the last 3 decades in the territory of the Park. Apparently, otter extinction occurred in this area in the late 1970s (Cassola, 1986).

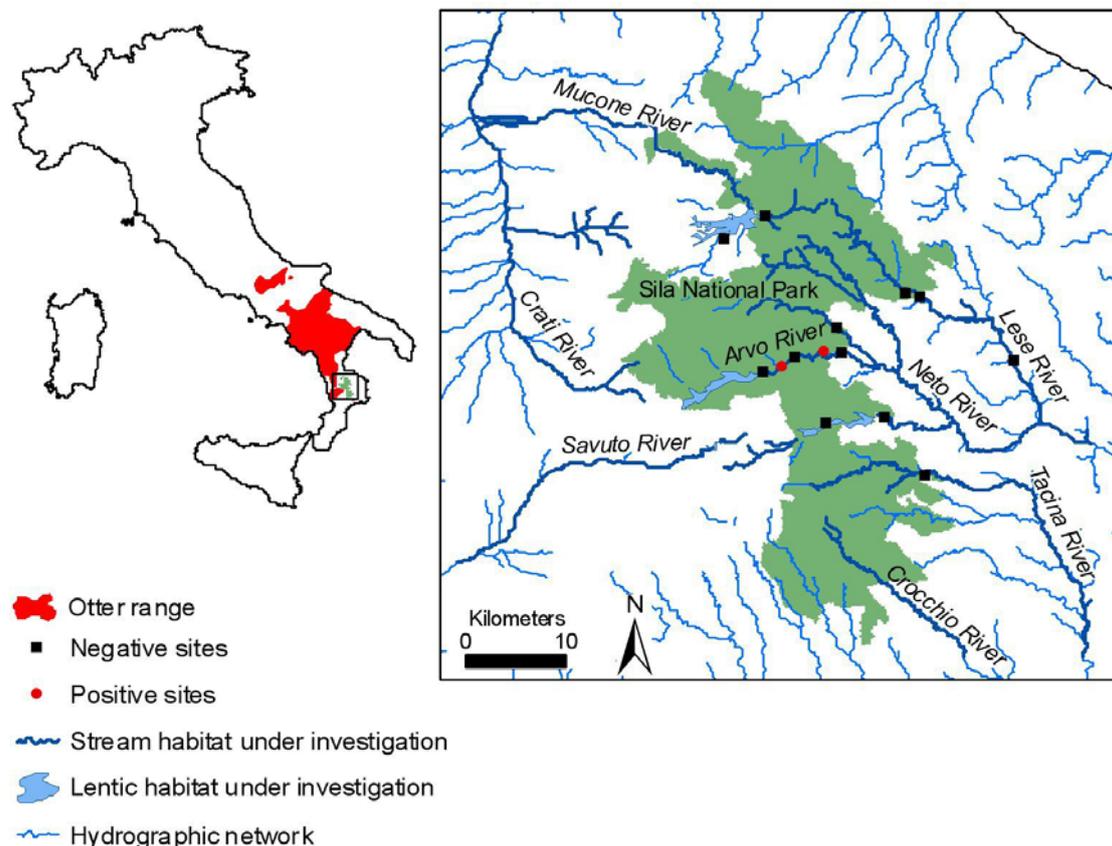


Figure 1 Distribution range of the otter (*Lutra lutra*) in Italy (Marcelli, 2006) and map of the study area.

In this paper, we present some preliminary results of a research project in progress aimed to assess the status of the otter in the SNP and the potential suitability of the aquatic habitats of the SNP for otter recolonization at the southern edge. We planned activities of this research project to 1) document the presence of otters in the SNP by field survey, 2) estimate the proportion of habitat used by otters in the streams and

lakes within SNP and in the neighbouring areas after accounting for imperfect detection, 3) identify potential corridors crossing the drainage divide and connecting established populations of Crati and Savuto rivers with Neto and others small rivers on the east side of the Park.

STUDY AREA AND METHODS

In order to define the study area and the aquatic habitat to be investigated, we selected a portion of semi-continuous hydrographic network (1/250000) along the western and eastern river basins crossing the SNP by using a GIS. The Sila lakes were also considered (Fig. 1). The study area includes very different vegetation types and climatic conditions, changing from the mediterranean types of the lowlands areas to the continental types of the Sila upland. Elevation of the SNP ranges from 445 to 1928 m, with a mean of 1339 m. Vegetation is dominated by coniferous forests. Human density is low (48 inhabitants/km²). Lowlands around the SNP have much higher human densities.

We selected a random sample of 70 squares from the UTM 1-km squares intersecting the aquatic habitat. The minimum distance between sampling squares was set to 1 km. Otter presence-absence data are being collected in the selected squares by searching otter spraints. In order to account for low otter detectability we have planned a minimum number of three repeated visits (sampling occasions). At each visit a stream section up to 600-m in length inside a 1-km square will be explored searching for spraints (Reuther et al., 2000). Repeated visits will be carried out monthly.

Random selection of sampling units adopted in this study differs from uniform sampling of the standard method for determination of otter distribution (Strachan and Jefferies, 1996; Reuther et al., 2000). Nevertheless, random selection allows reliable inference on habitat use by species (MacKenzie and Royle, 2005). Moreover, a minimum distance of 1 km is suitable to study habitat use on a fine scale in our small study area.

Occupancy models by Mackenzie et al. (2002) will be used to estimate the true proportion of used habitat after accounting for imperfect detection. Corridors will be identified by using logistic regression modelling and GIS.

A survey of otter distribution has begun in March 2009 and will continue until to September 2009.

RESULTS AND DISCUSSION

At present we have surveyed 14 sites of the first sampling occasion. We have found 3 spraints at 2 sites along the Arvo river in the SNP (Fig. 1). The age of the spraints was probably 1-2 weeks old (dry but still smelling). Altitude of sites were 1116 and 1213 m. These records represent the first evidence of otter presence in the SNP and the highest altitude of the recent otter occurrence documented in Italy. Survey sites on the Sila lakes were negative. The naïve estimate of used habitat (sum of positive squares/total squares) in the sampled area was 14.0%. However, we had some evidence that we collected some false absences. In fact, along the Arvo river we did not find spraints in 2 sites very close to the positive sites, within a distance of 2 km (Fig. 1). Most likely otters used these river sections, but spraints were not found. False absences in our data could be due to the combined effects of low otter density and intense raining and flooding of the winter season (Fusillo et al., 2007). Rains and floods could have washed spraints and destroyed traditional marking sites, respectively.

The latter effect was evident in a section of a tributary of the Neto river. In the ongoing survey, we were not able to find spraints at this section. Recent flooding has profoundly changed the stream morphology at this section destroying some traditional marking sites confirmed by us in the 2003, 2004 and 2008. Repeated surveys in the next months are necessary to attribute the negative outcome at the Neto river site to a local extinction or to a false absence.

One of the 2 positive sites detected during the ongoing fieldwork was surveyed by us also in the summer of 2003. It was negative at that time (Marcelli and Fusillo, in press). These data seem to indicate that otter recolonization in the southern periphery of Italian range is still in progress. Long term monitoring could evidence unstable presence of the otters in the Sila upland. However, our preliminary findings seem to indicate that the habitats within the SNP may be at least suitable corridors for otters. As a consequence, management actions in the SNP seem very important to favour otter recolonization in the context of conservation planning at national scale. Fish availability could be a key factor for otter conservation in this area characterized by oligotrophic streams. Some pilot fish restoration actions have been realized in the SNP through the re-introduction of *Salmo trutta macrostigma*, an endemic Italian subspecies. The presence of otters is a strong motivation for improving management and conservation of fish populations in the SNP.

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RESUME

Suivi Des Populations Périphériques De Loutre D'europe (*Lutra lutra*) Dans Le Sud De L'italie: Nouvelle Données De Présence Dans Le Parc National De La Sila

Après une période de fort déclin, la Loutre d'Europe (*Lutra lutra*) a recolonisé une partie de l'Italie entre 1984 et 2004, surtout en périphérie sud de son aire de répartition. Le Parc National de la Sila possède une position stratégique le long d'un réseau hydrographique séparant les populations du sud de l'aire de répartition de zones inoccupées mais potentiellement recolonisables. Une étude est actuellement en cours afin d'évaluer la qualité des habitats aquatiques du Parc National de la Sila dans le cadre d'une recolonisation par la Loutre. À ce jour et au sein de l'aire d'étude, 14 sites ont été analysés afin de détecter la présence de l'espèce. Deux sites se sont révélés positifs sur le fleuve Arvo. Ces données sont les premiers signes de présence de la Loutre dans le Parc National de la Sila après que l'extinction se soit apparemment produite vers la fin des années 1970. Notons que l'un des deux sites positifs était négatif en 2003. Ceci semble indiquer que la recolonisation en périphérie sud de l'aire de distribution italienne soit toujours en progression. Les actions de gestion du Parc National de la Sila doit à l'avenir favoriser le processus de recolonisation.

RESUMEN

MONITOREO DE POBLACIONES PERIFERICAS DE NUTRIA EURASIATICA (*Lutra lutra*) EN EL SUR DE ITALIA: NUEVAS APARICIONES EN EL PARQUE NACIONAL DE LA SILA.

Luego de un período de fuerte disminución poblacional, la nutria eurasiatica (*Lutra lutra*) ha re-expandido su área de distribución en Italia entre 1984 y 2004, principalmente hacia el extremo sur de su territorio original. El Parque Nacional de la Sila está localizado en una posición estratégica a lo largo de una divisoria separando las poblaciones periféricas al sur, de hábitats no ocupados pero potencialmente recolonizables al norte. Un proyecto de investigación encaminado a evaluar los hábitats acuáticos del Parque Nacional de la Sila para recolonización de nutria se encuentra en progreso. Hasta la fecha, se han monitoreado 14 sitios de muestreo para detectar la presencia de nutria en el área de estudio. Dos sitios a lo largo del río Arvo demostraron presencia de nutrias. Estos sitios representan la primera evidencia de nutrias en el Parque Nacional de la Sila luego de su extinción supuestamente hacia finales de los años 70s. Uno de los dos sitios positivos fue negativo durante el monitoreo del año 2003 probablemente debido a falsas ausencias. Estos datos parecen indicar que la recolonización de nutria sobre el extremo sur la región de distribución en Italia continúa en progreso. La recolonización del Parque Nacional de la Sila podrían favorecerse con acciones de manejo adecuadas.