

Presence of the Eurasian otter *Lutra lutra* (Linnaeus, 1758) (Mammalia Mustelidae) in the Foce Sele-Tanagro Nature Reserve (Campania, Southern Italy)

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ABSTRACT

In Italy, the Eurasian otter, *Lutra lutra* (Linnaeus, 1758) (Carnivora Mustelidae), occurs with two separated populations in the southern regions and recently it has also re-colonized the north-eastern fluvial networks. Here, we present the first photographic evidence of the Eurasian otter presence along a stretch of the Calore river (Campania region, Southern Italy), where this species was generically reported in previous study. Our findings enlighten that the Calore river network might play an important role for the conservation and expansion of this species in Campania.

KEY WORDS

Lutra lutra; survey; Calore river; Campania; Southern Italy.

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INTRODUCTION

The Eurasian otter *Lutra lutra* (Linnaeus 1758) is a semi-aquatic mesocarnivore belonging to the family Mustelidae. This species has one of the widest distributions of all Palearctic mammals, from Ireland to China and down to Southeast Asia (Roos et al., 2015), although its distribution is very fragmented, especially in Europe, where anthropogenic factors are responsible for a low-quality habitat. In Italy, the range of the Eurasian otter appears divided into two parts: an area that falls mainly within the Molise and partly within Abruzzo regions; while the other, wider area, located south of the previous one, includes most of the regions of Campania, Basilicata, Calabria and part of Puglia (Picariello et al., 1999; Fusillo & Marcelli, 2014). Furthermore, recent findings of signs as well as road-killed indivi-

duals in north-eastern Italy suggest a possible return of the Eurasian otter in the river network of this area (Pavanello et al., 2015; <http://www.units.it/lontra>). However, the conservation status of this species is such to justify its inclusion in the Annexes II and IV of the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and wild fauna and flora).

The Foce Sele-Tanagro Nature Reserve (about 7284 ha) is a protected natural area in Southern Italy, established by decree of the President of the Regional Council of Campania No. 379, dated 11.06.2003. This area extends along the coastline flanking the mouth of the Sele river and in the territory surrounding the Sele, Tanagro and Calore rivers (Fig. 1), covering numerous municipalities in the provinces of Avellino and Salerno, and it is characterized by a widespread good environmental quality.

During our recent field survey of malacofauna, ichthyofauna and herpetofauna along the Calore basin river that affects the Foce Sele-Tanagro Nature Reserve (Guarino et al., in prep.), we found signs of the Eurasian otter and provided photographic evidence of its presence in this area, where it had been generically reported before (Fusillo et al., 2007; Fusillo & Marcelli, 2014). Here we report the results of the early surveys and some new records which might be useful to national and local authorities in order to ensure a local sustainable management of this endangered species.

MATERIAL AND METHODS

The study area includes about 2 km² (approximately 6.4 km river length and 0.3 km river surface) of the Calore river (latitude: 40°33.724'N /40°31.467' N, longitude: 15°09.276/15°10.755 E) (Fig. 1) and its associated riparian vegetation, which mainly consists of willow (*Salix* sp.), poplar (*Populus* sp.), alder (*Alnus* spp.), oaks (*Quercus cerris* L.) and reedbeds (*Phragmites* sp.) (Fig. 2). Other common species are: *Juglans regia* L., *Robinia pseudoacacia* L., *Hippocrepis emerus* (L.) Lassen.

To survey the presence of the Eurasian otter we used “observational methods” (Hoffmann et al., 2010), including direct observations and identification of signs, mainly spraints (otter faeces) and footprints.

The direct observation was carried out during the period 2016–2018, between April and July when the species is usually more active due to a combination of favorable climate and trophic availability, from early morning to dusk.

To determine the contents of the spraints, first we put them in hot water with a common detergent, then we washed through a 0.5 mm mesh sieve, air dried and lastly gently disrupted by hand. Examination of the contents was performed using a magnifying glass and Leica EZ4 Stereo Microscope (16–70 x magnification). Following Gorgadze (2013), we divided the spraints contents into eight groups: mammals, birds, reptiles, amphibians, fishes, crayfish, insects and molluscs. For their identification we referred to some collections stored at the Department of Biology, University of Naples. In particular, mammals, birds, reptiles and amphibians were identified from their bones and/or teeth (in the case of reptiles, also from remains of exuviae); fishes were identified from their bones and scales; insects and other arthropods from their exoskeleton and/or remains of wings, legs and cuticles.

RESULTS AND DISCUSSION

On April 6th 2016, between 9.00 a.m. and 9:30 a.m., we sighted and recorded photos of an otter individual while eating, then while marking its terri-

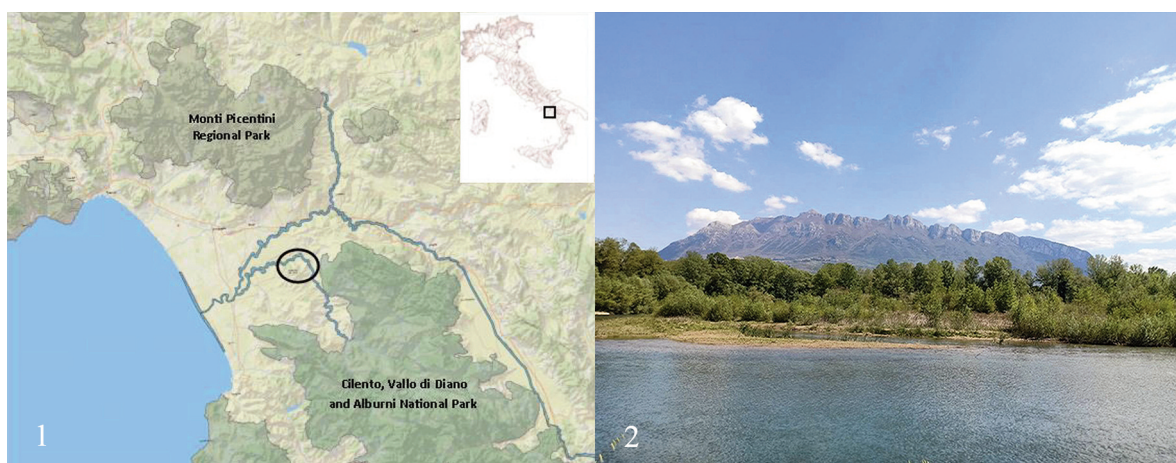


Figure 1. Top right: map showing location of the Foce Sele-Tanagro Nature Reserve, Italy (empty black square); on the left: higher magnification of the black square showed in the map: black empty ellipse shows the area study. Figure 2. Calore river, study area.

tory out of the water and lastly while going into its supposed den (Figs. 3–5). Further sightings of single individuals were documented on May 20th, 2017 in the same spot, and on June 5th, 2018 south of the confluence of Sele and Calore rivers, in the morning. These sightings are interesting considering that otters are predominantly nocturnal.

Throughout the research period, many footprints of single individual, prey remains and 10 spraints were also found. The prey remains have been identified as freshwater crab *Potamon fluviatile* (Herbst, 1785), white-clawed crayfish *Austropotamobius pallipes* (Lereboullet, 1858), regarded as species complex, pond shrimp *Palaemonetes antennarius*



Figures 3-5. Otter photographed with Nikon D7000 + Tamron SP 70-300 mm F4-5.6 Di VC USD along the Calore river on April 6th, 2016 (photos by F. Bolinesi).

Class, Ordo	Species	HD Annex
Cephalaspidomorphi, Petromyzontiformes	<i>Petromyzon marinus</i>	II
Actinopterygii, Cypriniformes	<i>Alburnus albidus</i>	II
	<i>Barbus plebejus</i>	II, V
	<i>Sarmarutilus rubilio</i>	II
Amphibia, Anura	<i>Hyla intermedia</i>	IV
Reptilia, Squamata	<i>Lacerta bilineata</i>	IV
	<i>Podarcis siculus</i>	IV
	<i>Elaphe quatuorlineata</i>	II-IV
	<i>Hierophis carbonarius</i>	IV
	<i>Natrix tessellata</i>	IV

Table 1. Ichthyofauna and herpetofauna species listed in the Annexes to the Habitat Directive (Council Directive 92/43/EEC) observed in the study area.



Figure 6. Remains of *Natrix* sp. exuviae identified in the sp 2/2018 within the study area (photo by F.M. Guarino).

(H. Milne Edwards, 1837), and indeterminable fish species. We analyzed two spraints collected on April 9th, 2018 (sp 1/2018) and June 13th, 2018 (sp 2/2018), respectively. In the Sp 1/2018 we identified remains of: arachnids (a taxonomically unidentified individual); insects belonging to different families of the order Coleoptera: Familia Dytiscidae and Gyrinidae, water beetles, and Familia Carabidae; fishes: *Sarmarutilus rubilio* (Bonaparte, 1837) (Familia Cyprinidae); amphibians: only frogs belonging to Familia Ranidae, genus *Pelophylax* Fitzinger, 1843. In the Sp 2/2018 we identified remains of: insects (wings of unidentified taxa); fishes

(unidentified taxa); reptiles, specifically water snake *Natrix* sp., likely *N. tessellata* (Laurenti, 1768), mainly based on remains of exuviae with dorsal scales keeled (Fig. 6); vegetable fragments. In none of the two spraints we identify remains of mammals, birds, crayfish and molluscs. On the whole, our analysis on spraints and prey remains are in agreement with previous studies (Gorgadze, 2013) by showing that otters consume a wide range of prey, even if most of their diet consists of fish. It is also well known that otter's diet varies according to habitats and seasons (MacDonald & Mason, 1982; Brzezinski et al., 1993; Gorgadze, 2013).

The Eurasian otter is categorized as “Near Threatened” by the IUCN Red List of Threatened Species but “Endangered” both by Red List of Italian Vertebrates (Rondinini et al., 2013) and Red list of terrestrial and freshwater vertebrates of Campania (Fraissinet et al., 2013). The critical status of the otter population in Campania has been mainly attributed to the alteration and fragmentation of the flowing-water habitats due to recent recrudescence in the exploitation of the territory (Fraissinet et al., 2013). However, our repeated sightings of otters along the Calore river network enlighten that this river might play an important role for the conservation and expansion of this species at regional level.

It is noteworthy that the study area is characterized not only by a river network suitable for the otter but also by widespread good environmental

quality where rich zoocenoses live, including numerous ichthyofauna and herpetofauna species listed in the Annexes to the Habitat Directive (Council Directive 92/43/EEC) (Tab.1) (Guarino & Maio, 2013). Other aquatic taxa of considerable interest for conservation biology found by the authors in the study area are the crayfish, *Austropotamobius pallipes* (Lereboullet, 1858), and the freshwater bivalve *Anodonta* sp. The former species has been observed along the river since September 2002, besides the otter spraints, but so far it has never been reported in the Calore river (De Vico et al., 2011). *Anodonta cygnea* is a native species whose local population is potentially threatened due to *Sinanodonta woodiana* (I. Lea, 1834), an invasive alien species recently found at the mouth of the Sele river, probably introduced from Asia and Eastern Europe by placing various species of Cyprinidae for fishing purposes (Carella et al., 2013).

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