

The return of the Eurasian otter in north-eastern Italy. New challenges for biological conservation from Friuli Venezia Giulia Region.

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ABSTRACT

The Authors outline the present situation of the Eurasian otter *Lutra lutra* in Friuli Venezia Giulia Region (north-eastern Italy). After about 50 years from its local extinction, the species is surely coming back. The return probably dated back to 2006, but the first proof was a road kill on the Friulian Morainic Hills in 2011. Biomolecular data indicated an Austrian origin of this first specimen. Field researches did not confirm this evidence until 2014, when otter spraints were found near Fusine in Valromana (Tarvisio, Udine), close to the Italian-Austrian border. Further field work confirmed that the whole Italian Danube Catchment from Tarvisio Municipality is inhabited by a breeding nucleus of 4 to 7 otters. Further bridge otter survey indicated that the distribution of the otters in the whole Friuli Venezia Giulia Region was still increasing, both on the Carnic, Julian and Karavanke Alps, up to the border with Veneto Region. The cohabitation with *Neovison vison* (Western Carnic Alps) and the road mortality (8 road kills from 2011 to 2019) represent possible threats to the establishment of a viable population in north-eastern Italy.

Keywords: *Lutra lutra*, distribution, north-eastern Italy, Friuli Venezia Giulia Region.

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PREFACE

Lutra lutra is strictly protected both in Italy (National Law 157/92) and in Europe (Bern Convention and Habitat Directive EU 92/43 CEE). Being included in II and IV Annexes of the Habitat Directive, the species requires constant monitoring and six-yearly interval reporting to the EU. In Friuli Venezia Giulia monitoring is coordinated by the public administration of the Autonomous Region Friuli Venezia Giulia (Lapini et al., 2014).

The otter was historically quite common and widespread in northern Italy until the middle of the 20th century, when it started to decline in many regions (Cassola, 1986). The species was relatively well distributed in large part of the Region Friuli Venezia Giulia till the beginning of the 20th century, particularly in the wet lowlands and hills of the Tagliamento River and Isonzo flood plain (Figure 1) (Lapini, 1985, 1986).

The extinction of the species in the Region probably dated back to 1967, when the last specimen from the autochthonous reproductive population had been caught on the Stella River, near Precenicco (Udine) (Lapini, 2012). The skull of this specimen is still preserved in the Mammal Collection of Friulian Natural History Museum (Lapini, 1988; De Marinis and Lapini, 1994).

In the subsequent years only sporadic records had been ascertained in the Region (spraints in 1984 and 2008) (Lapini, 1985, 1986; Lapini and Bonesi, 2011), probably due to Austrian or Slovenian vagrant males.

In 2011 and 2012 two vagrant males were road killed in the same area of Central Friuli Venezia Giulia Region (Municipality of Treppo Grande and Trasaghis, Udine). The biomolecular investigations performed on the single vagrant male road killed in 2011 in the Municipality of Treppo Grande (Udine: Lapini and Bonesi, 2011) indicated strong affinities with Austrian otters, thus confirming previous predictions of a possible expansion from Austria or Slovenia (Lapini and Bonesi, 2011; Cianfrani et al., 2011; Loy et al., 2015)

The first uncertain signs of its presence along the borders with Austria (Tarvisio Municipality, Udine) dated back to 2006, when a single specimen entered in the cooling pool of the snow chain Factory Weissenfels (today named Kito-Weissenfels Chain Factory, Fusine in Valromana, Tarvisio, Udine). The animal was seen in the pool and later running away from the pool by many factory-workers. This sighting occurred along the mountain brook 'Rio del Lago Inferiore di Fusine in Valromana'. However, field survey performed in July and in August of 2006 did not allow to confirm this interesting anecdotal datum (L. Lapini and L. Dorigo obs.).

Between 2013 and 2014, F. Jordan ran a survey of American mink (*Neovison vison*) granted by University of Trieste (in the frame of the so-called Sharm Project). During this survey otter spraints were found along the mountain brook 'Rio del Lago Inferiore di Fusine in Valromana' (M. Pavanello obs., 18 March 2014: Jordan, 2014). These were the first confirmations of otter presence in Danubian waters from Italian Carnic and Karawanken Alps of Tarvisio Municipality (Lapini et al., 2014; Pavanello et al., 2015) (Figure 2).



Figure 1 Otter-hunters from the Tagliamento River Catchment, Morainic Hills of Friuli Venezia Giulia Region. Photo of the 1930–1940s of the 20th Century from Urbignacco Swamps, Buja, Udine (Photo from archives Papinutto, Buja).

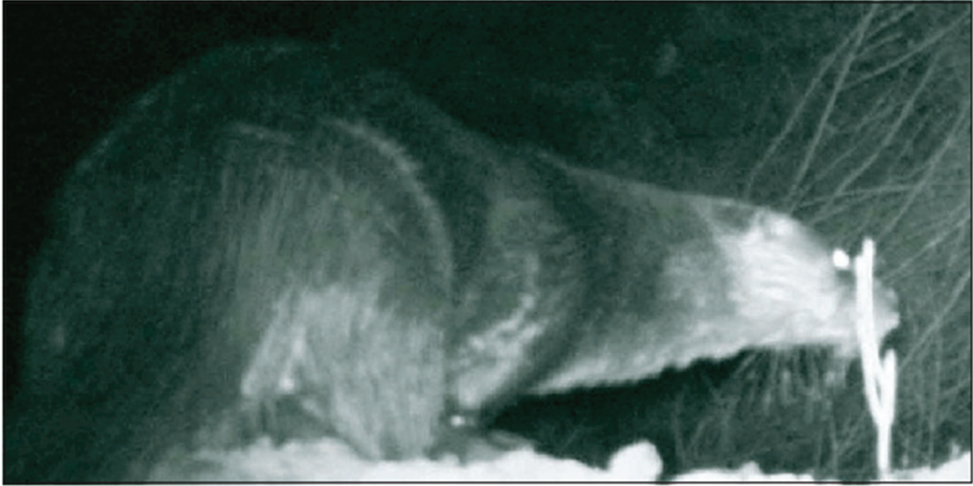


Figure 2 The first Eurasian otter *Lutra lutra* camera trapped in Friuli Venezia Giulia, near the sprainting sites published by Jordan, 2014 (Piana di Fusine-Ratece, Tarvisio, Udine, 30 April 2014, Photo S. Pecorella).

In these zones the otter dwells in a 60-km drainage system of mountain brooks tributaries of Danube trough the Rivers Slizza (in Austria via Gail and Drau) and Sava Dolinka (in Slovenia), with a small reproductive population of at least 4–7 specimens (Lapini et al., 2014). This evidence stimulated additional extended surveys, particularly aimed to check the status of the otter in the whole Friuli Venezia Giulia Region.

Preliminary results are reported by Jordan (2014), Lapini et al. (2014), Pavanello et al. (2015). First results were encouraging (Lapini, 2019), and field work was further implemented with the collaboration with ‘Progetto Lince Italia’ (Tarvisio, Udine), the Carabinieri-Forestry Corps (Tarvisio Station); the Forestry Service of the Region Friuli Venezia Giulia, and various volunteers.

This paper represents a provisional update of field work results dated 23 June 2019.

METHODS

We have chosen an extended bridge otter survey, ideally extended to all the 106 ETRS/LAEA Europe 10 × 10-km cells covering the whole Friuli Venezia Giulia Region, including the Municipality of Sappada, only recently annexed to Friuli Venezia Giulia (Province of Udine) (National Law 182 of 15 December 2017).

Survey was performed at all available suitable bridges, which were systematically checked for otter spraints. A bridge was defined suitable if characterized by a structure able to stimulate the sprainting behaviour by otters (Pavanello et al., 2015) and to preserve the otter spraints from rainfall (Figure 3).



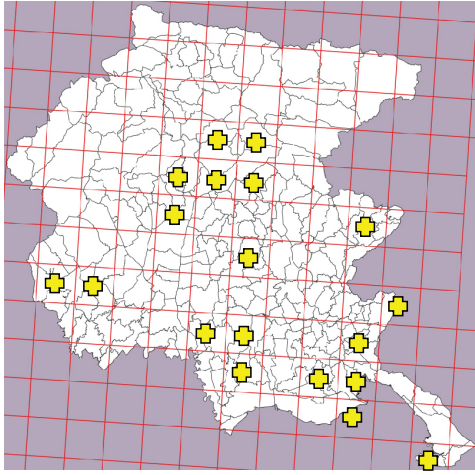
Figure 3 Physical characteristics of a bridge considered suitable for the present otter survey. Bridge on the Geu-Acqualena brook (Forni Avoltri Municipality, Udine), 1025 m a.s.l., positive for otter spraints on 15 June 2019. Foto L. Lapini/G. Cantarutti.

Positive and negative sites were georeferenced and were reported on the ETRS 89 LAEA 10 × 10-km cartographic grid system. The overall data bank of this survey will constitute the base of further monitoring in the whole Region, in the frame of the monitoring requested by the EU 92/43 Directive, partially granted by the public Administration of the Autonomous Region Friuli Venezia Giulia (e.g. Lapini et al., 2014).

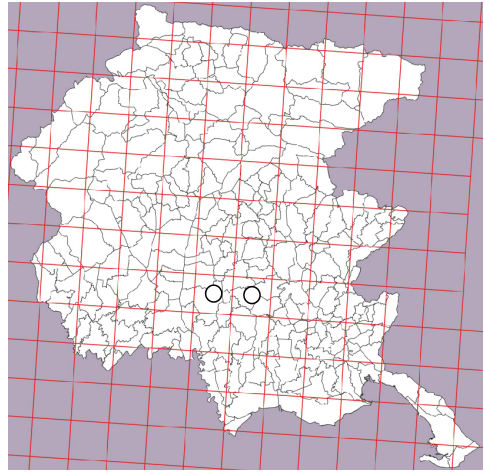
PROVISIONAL RESULTS AND REMARKS

At present, we have surveyed only 38.68% (41 out of 106 10 × 10-km ETRS Cells) of the whole Friuli Venezia Giulia Region, collecting various new records of otter presence, both from sprainting sites and road kills or from other sure sources (footprints, camera-trapping, alive recovered specimens, et so on) (Figure 4).

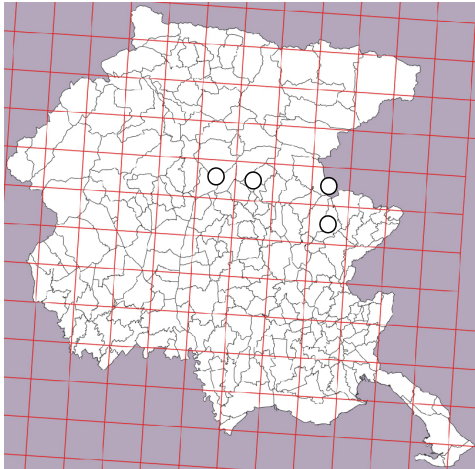
The presence of the otter is increasing on Julian and Carnic Alps, both to the East (Tarvisio, Malborghetto Valbruna and Pontebba Municipalities) and to the West (Forni Avoltri Municipality). An otter spraint collected on June, 15th, 2019



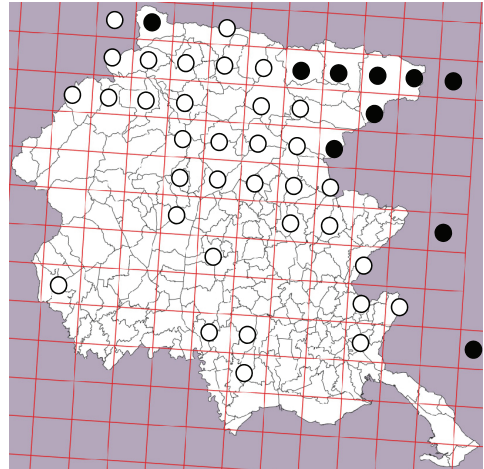
Historic data before 1967



Uncertain data 1968–1983



Sure data (spraints and road kills) 1884–2013



Black circle: spraints, road kills, camera traps data 2014–2019; White circle: surveyed negative cells in the same period

Figure 4 Overall picture of the data about the Eurasian otter *Lutra lutra* in north-eastern Italy (Friuli Venezia Giulia Region). Cartographic synthesis ETRS 89 LAEA 10 × 10 km. From Lapini, 1985, 1986, 1988; Lapini and Bonesi, 2011; Lapini, 2012; Iordan, 2014; Lapini et al., 2014; Pavanello et al., 2015; Lapini, 2019; present survey (2014–2019). Neighbouring Slovenian territory has been only sporadically surveyed thanks to the cooperation with N. Krbis, G. Luznik and B. Pellarini.

at the border between the Municipalities of Forni Avoltri (River Tagliamento Catchment) and Sappada (R. Piave drainage system) suggests that the otter could have also reached the Veneto Region, deserving further survey in this areas.

We confirmed the presence of the otter in the Municipality of Forni Avoltri. The first record of its occurrence in this area was dated 12 February 2017, when a video made by S. Del Fabbro recorded a fishing otter under the bridge of Forni Avoltri village. The specimen, probably a 3–4 month-old cub, caught a big trout under a boulder in the River watercourse.

In contrast, the lowlands of Friuli Venezia Giulia Region seem to be still avoided by otters.

The co-occurrence of the otter and the American mink was ascertained in the Municipality of Forni Avoltri (Udine) (Iordan, 2014; Lapini, 2019), but at present it doesn't seem of particular concern. However, being an allochthonous invasive predator (Bonesi and Palazon, 2007), the former should be eradicated from all member states following recommendation by EU (Genovesi, 2000).

Road mortality surely represents the main threat for otters in north-eastern Italy. During the period 2011–2019 at least eight otters were road killed in Friuli Venezia Giulia Region (Table 1). Six were killed in the Municipality of Tarvisio, one in the Municipality of Treppo Grande, and one in the Municipality of Trasaghis (all in the Province of Udine).

Breeding seems to be quite frequent in the small otter population of Tarvisio, with various newborns ascertained both by footprints, cub road kills, and puppies rescued in the town of Tarvisio. Specifically, newborns have been ascertained in 2014 (footprints), 2015 (footprints), 2016 (footprints, camera trapping), 2017 (footprints, road kill of a three-month-old female cub, see Figure. 5), 2018 (footprints, camera trapping) and 2019 (footprints, camera trapping, recovery of a three-month-old live puppy in the centre of Tarvisio, this last recovered and released on 24 May 2019).

To prevent road accidents in the Municipality of Tarvisio a specific EU Life project has been planned aimed to mitigate otter road mortality.

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Table 1 Road kills of *Lutra lutra* from north-eastern Italy in the period 2011–2019 (Friuli Venezia Giulia Region, Province of Udine).

Sex	Locality	Date	Municipality	Province	Collector
Male	Between the swamp of Urbignacco and Bueriis	11Sept2011	Treppo Grande	Udine	M. Lostuzzo obs.; L. Lapini leg.
Male ?	Highway bridge	10Aug2012	Trasaghis	Udine	L. Lapini and E. Vida leg.
Male	Left bank of the R. Slizza near Tarvisio Cemetery	7Aug2016	Tarvisio	Udine	A. Chiavotti obs.; M. De Bortoli, P. Molinari and R. Pontarini leg.
Male	Highway in loc. Rutte di Camporosso	21Aug2017	Tarvisio	Udine	P. Molinari leg.
Male	Highway in loc. Rutte di Camporosso	9Sept2017	Tarvisio	Udine	P. Molinari leg.
Two-three months old Female	Left bank of the R. Slizza near the sports field of Tarvisio	28Nov2017	Tarvisio	Udine	F. Princi obs.; P. Molinari leg.
Male?	Highway near Coccau	13Apr2018	Tarvisio	Udine	P. Molinari leg.
Male	Loc. Boscoverde, cross road between SS54 and Via Bamberga	15Mar2019	Tarvisio	Udine	R. Colloredo obs.; R. Pontarini and P. Molinari leg.

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Figure 5 Above: right lateral vision of a two-three months old female cub road killed on 28 November 2017, in Tarvisio village (Udine). Photo D. De Martin.

Below: dentition of the same specimen, at the end of milk dentition. Photo L. Lapini.

REFERENCES

- Bonesi, L. and Palazon, S. (2007) The American Mink in Europe: status, impacts, and control. *Biological Conservation* 134: 470–483.
- Cassola, F. (ed.) (1986) La Lontra in Italia. Censimento, distribuzione e problemi di conservazione di una specie minacciata. WWF ed., *Serie Atti e Studi*, 5, Roma. .
- Cianfrani, C., Le lay, G., Maiorano, L., Satizàbal, H., Loy, A. and Guisan, A. (2011) Adapting global conservation strategies to climate change at the European scale: The otter as a flagship species. *Biol. Conserv.* 144: 2068–2080.
- de Marinis, A. and Lapini, L. (1994) Collections of Italian Mustelidae (*Mammalia*, *Carnivora*) housed in Italian Museums. *Boll. Mus Reg. Sci. Nat. Torino*, 12: 255–325.
- Genovesi, P. (2000) Guidelines for Eradication of Terrestrial Vertebrates: a European Contribution to the Invasive Alien Species Issue. Compiled by: Piero Genovesi, PhD Co-ordinator European Section IUCN/SSC Invasive Species Specialist Group National Wildlife Institute – Italy infspak@iperbole.bologna.it: 1–28.
- Jordan, F. (2014) The American mink and the Eurasian otter in Friuli Venezia Giulia: a study to reveal their distribution and the most sensitive areas for their expansion. *University of Trieste, Progetto Sharm 2013–2014*, Supervisor prof. A. Altobelli: 1–42.
- Jordan, F., Lapini, L., Pavanello, M., Poledni, L. and Rieppi, C. (2016) Short note: Evidence for naturalization of the American mink (*Neovison vison*) in Friuli Venezia Giulia, NE Italy. *Mammalia*, De Gruyter ed. DOI 10.1515/mammalia-2015–0044
- Lapini, L. (1985) La Lontra. C. Lorenzini ed., Udine.
- Lapini, L. (1986) La Lontra in Friuli-Venezia Giulia. In: CASSOLA F. (curatore), 1986. La Lontra in Italia. Censimento, distribuzione e problemi di conservazione di una specie minacciata. WWF ed., *Serie Atti e Studi*, 5, Roma: 48–51.
- Lapini, L. (1988) Catalogo della collezione teriologica del museo friulano di storia naturale. *Pubbl. Mus. Fr. St. Nat.*, 35, Udine.
- Lapini, L. (2012) Occhi aperti. La lontra sta tornando. *Pesca e Ambiente. Notiziario d'informazione ittica e gestione delle acque regionali*, ETP-Ente Tutela Pesca del Friuli Venezia Giulia – Regione Autonoma Friuli Venezia Giulia publ., Udine: 17–19.
- Lapini, L. (2019) Il ritorno della lontra (*Lutra lutra*) nell'Italia nord-orientale. *Habitatonline*, Marzo 2019. <https://www.habitatonline.eu/2019/03/il-ritorno-della-lontra-lutra-lutra-nellitalia-nord-orientale/>
- Lapini, L. and Bonesi, L. (2011) Evidence of a natural recovery of the Eurasian otter in northeast Italy. *Proc. of the 29th European Mustelid Colloquium Hosted by Mammal Society* (3–4 December 2011), Southampton, UK.
- Lapini, L., Dorigo, L., Glerean, P. and Giovannelli, M.M. (2014). Status di alcune specie protette dalla Direttiva Habitat 92/43 CEE nel Friuli Venezia Giulia (Invertebrati, Anfibi, Rettili, Mammiferi). *Gortania. Botanica, Zoologia*, 35: 61–140.
- Loy, A., Balestrieri, A., Bartolomei, R., Bonesi, L., Caldarella, M., de Castro, G., Della Salda, L., Fulco, E., Fusillo, R., Gariano, P., Imperi, F., Jordan, F., Lapini, L., Lerone, L., Marcelli, M., Marrese, M., Pavanello, M., Prigioni, C. and Righetti, D. (2015) The Eurasian otter (*Lutra lutra*) in Italy: distribution, trend and threats. European Otter Workshop 2015, Swedish Museum of Natural History in Stockholm, Sweden 8–11 June 2015 (poster)
- Pavanello, M., Lapini, L., Kranz, A. and Jordan, F. (2015) Rediscovering the Eurasian otter (*Lutra lutra*) in Friuli Venezia Giulia (NE Italy) and notes on its possible expansion in northern Italy. *IUCN Otter Spec. Group Bull.*, 32(1): 12–20.