

# CONSERVATION STATUS OF EURASIAN OTTER *Lutra lutra* IN ITALY

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## CURRENT RANGE AND TREND

The southern Italian otter population is considered an Evolutionarily Significant Unit<sup>a</sup>, as it is completely isolated from other European populations. The two former disjointed nuclei of this core population are now a unique metapopulation<sup>b</sup>. Expansion at the edge of this range is proceeding hesitantly with presence/absence varying year by year, especially in Abruzzo and Apulian rivers (Foro, Pescara, Alto Sangro, Candelaro) (Fig. 1). However, despite not all grid cells having been resampled over time and sampling designs were not homogeneous and consistent along time and space<sup>b,c,d,e,f</sup>, all trends of occupied cells are positive (Fig. 2).

As for northern Italy, the otter expansion in Austria and Slovenia promoted the return of the species on the eastern Alpine chain since 2011, where its rapid expansion is giving hope for the establishment of a viable population in the short-medium term<sup>g,h</sup>. Also, a new nucleus on the western part of the Alps was detected in 2020 on the Roya catchment<sup>i</sup> across the French border. The Italian Alpine range is also hosting a isolated B-line population in the Ticino river, a population derived from reintroduction of individuals crossbred with *L. l. barang*. However, a recent study revealed this population is likely unviable and no otter signs have been recorded in the area since 2018<sup>e</sup> (Fig. 1).

## CURRENT AND MINIMUM VIABLE POPULATION SIZE

According to different estimates based on either density/km or density/grid cell derived from non invasive genetic samplings<sup>k,l</sup>, or derived from a Population Viability Analysis (PVA) current central southern population size is estimated between 800 and 1000 individuals<sup>c,m</sup>. This is still far from the Minimum Viable Population size of 5406 otters required for a 99% persistence probability over 40 generations<sup>m</sup>.

## CONSERVATION GOALS

### ACHIEVED

- ✓ filled the range gap between former populations in southern Italy

### STILL TO ACHIEVE

- expansion in Central Italy
- viability of northern populations

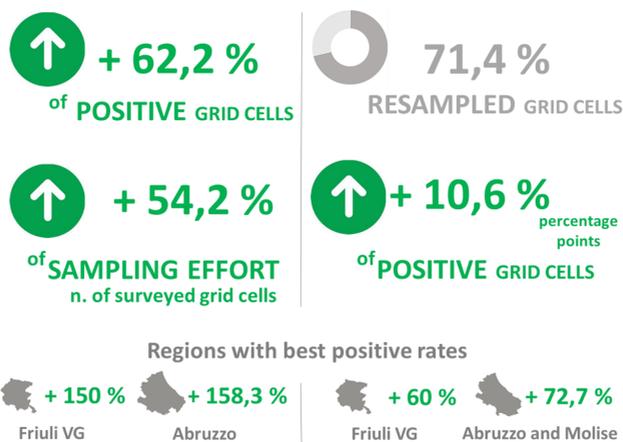


Fig. 2. Summary parameters of grid cell changes among the two last Italian otter reportings (2014 and 2020). Surveyed grid cells in grey. Change in occupancy values among different grid cell sample sizes collected during the time (left) and among the same resampled grid cells (n=187, right).

## CONSERVATION PRIORITIES

### SPECIES PROTECTION

- **monitor catchments at the periphery of the range** for fast alert on expansions pulses in new vast river basins (rivers Tanaro, Piave, Pescara and Liri)
- **conflict analysis** in recently colonized areas
- **mitigation measures** at hotspots of otter-vehicle collision risk
- **transborder strategy** in the Alpine context for management of populations in order to ensure colonization dynamics
- **establishment of a communal necropsy procedure** for health and contaminant monitoring
- **establish an efficient framework** for recovery, transport, storage, rescue and analysis of carcasses and live (orphaned and injured) otters

### HABITAT PROTECTION

- **Assess the cumulative effect** of mini hydroelectric power plants at the river basin scale
- **Interact** with professionals on water habitat protection and river restoration (water, riparian strips, sediments, deadwood) in order to make integrated efforts for Habitat, Water Framework and Floods Directive obligations and to ensure community lobbying adhesion
- **protect and restore priority coastal areas** to ensure connectivity among river basins.

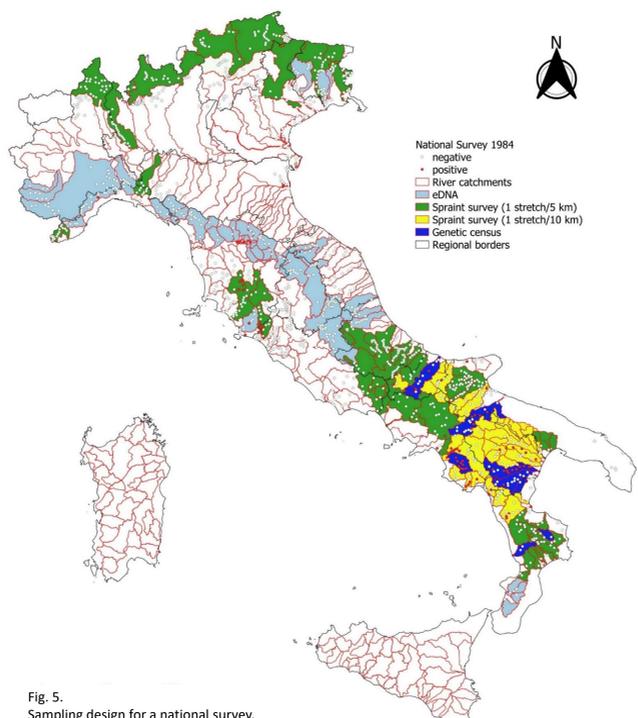


Fig. 5. Sampling design for a national survey.

## THREATS

**Road mortality.** Collision events are recorded mainly by citizen science and recorded on [therio.unimol.it/lontra](http://therio.unimol.it/lontra). Although they appear to intensify with time (Fig. 3), this may be also due to an increase awareness, a stronger reporting effort and faster communication technologies and social media. In the last ten years (2010-2020) 89 road killed otters were recorded (average rate: 8.9 per year), with an unbalanced ratio toward males (2:1).

A road risk model for southern Italy proposes that securing 10% of road stretches at risk would hamper 50% of road-kills<sup>n</sup>. Northern Regions like Friuli VG show as well high rates of road-killed otters, thus a specific UE Life project is undergoing to face the risk of collision on local populations.

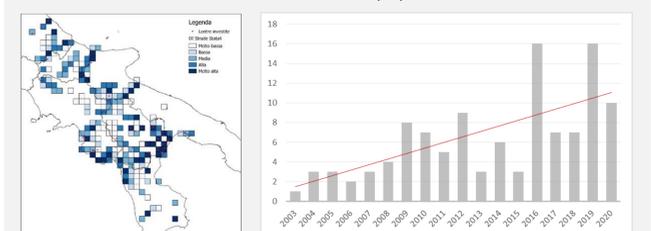


Fig. 3. Hotspot of road-kills in southern Italy (left). Annual numbers of otter road-killed in Italy according to the Italian otters' reports and findings website [therio.unimol.it/lontra](http://therio.unimol.it/lontra) and the [Italian Otter Network facebook page](https://www.facebook.com/ItalianOtterNetwork) (right).

**Population Viability Analysis.** Simulations on the Italian core population estimated the frequency and impact of catastrophic events related to climate change that might affect cub mortality (floods) or limit prey availability (droughts) combined with road-kills rate<sup>m</sup> (Fig. 4).

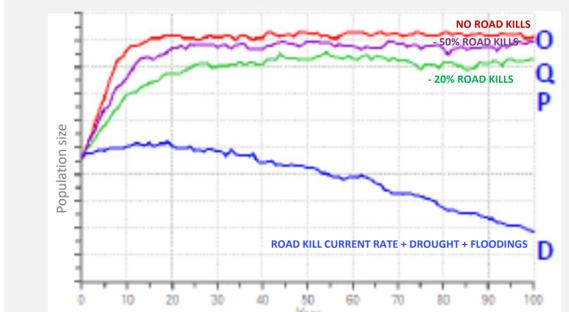


Fig. 4. PVA scenarios. D: synergetic and cumulative effects of flood and drought catastrophic events under current road-kill average rate. O (red): no road kills. Q (purple): 50% decrease of road kill. P (green): 20% decrease of road kill.

**Conflicts.** Retaliation and illegal killing related to poaching do persist. Potential conflicts with anglers, fish pond owners and fish farmers are especially concerning in Alto Adige and Abruzzo.

**Natural diseases.** Carnivore parvoviruses and morbillivirus were recently detected in carcasses<sup>o,p</sup>.

**Hydroelectric power stations.** Despite no data being available yet, the increase in number of small power stations in many river catchments might affect resource availability for otters. Cumulative impact at river catchment scale is needed to assess these effects.

## A NATIONAL-SCALE SURVEY

To monitor metapopulation trends, periodic national-scale surveys should be carried out, so as to achieve both temporal consistency of data and spatial coverage. A state-of-the-art survey should include different sampling methods and goals, based on current knowledge on otter distribution (Fig. 5). In the core area, a sub-sample of river catchments may be investigated through non-invasive genetic sampling to assess density and genetic variability, while a "soft" approach (approx. 1 station/10 km of watercourse) may be applied to confirm otter occurrence. Sampling effort should be doubled in potential areas of expansion, while eDNA could be used for the early detection of otters in areas unoccupied since the 1980s (Fig. 5).

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