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A SURVEY FOR SMOOTH COATED OTTER *LUTROGALE PERSPICILLATA* ON THE RIVER NARAYANI, CHITWAN NATIONAL PARK, NEPAL

PARAS MANI ACHARYA[1*], PARAS LAMSAL[2]

[1]Tribhuvan University, Patan M. Campus, Nepal
*Corresponding author, E-mail: otterofhimalayas@yahoo.com
[2]Tribhuvan University, Bhaktapur M. Campus, Nepal

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RIASSUNTO - ***Indagine sulla distribuzione della lontra liscia* Lutrogale perspicillata *lungo il fiume Narayani, Parco Nazionale di Chitwan, Nepal.*** In gennaio e giugno 2009, la distribuzione della lontra lungo il tratto del fiume Narayani incluso nel Parco Nazionale di Chitwan, è stata rilevata tramite il metodo standard, suddividendo il tratto investigato in sei sezioni, da monte verso valle. La presenza della specie è stata accertata nelle sezioni 2 e 3, lungo ramificazioni caratterizzate da bassa velocità della corrente e scarsa profondità, separate dal corso principale da dune sabbiose coperte da *Saccharum* sp. L'intensa attività di pesca e l'estrazione di sabbia in alveo potrebbero essere le cause dell'assenza della specie nei tratti a valle. La preferenza per i rami secondari probabilmente dipende dalla maggiore disponibilità di pesce e siti di rifugio durante la stagione dei monsoni.

Parole chiave: *Lutrogale perspicillata*, campioni fecali, impronte, distribuzione, conservazione, Nepal

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The smooth coated otter *Lutrogale perspicillata* has been reported as present in the major river basins of Nepal: Koshi, Narayani, Karnali and Mahakali (Shrestha, 2003). In recent decades, its populations have probably declined as a consequence of hunting and the overall loss of natural habitats (Acharya and Gurung, 1994; Acharya, 1997, 2006). Nonetheless research on otters is inadequate in Nepal and the distribution of this species is still poorly known. The smooth coated otter is known to live in large rivers, estuaries and coastal mangrove swamps and to require undisturbed riparian forests or scrub (IUCN, 1992). Generally, this species occurs in the lower, slow-flowing parts of the river, and in artificial lakes (Kruuk *et al.*, 1994; Kruuk, 2006). On the River Narayani, the status of smooth coated otters had been investigated by Evans *et al.* (1985) in relation to fish distribution and otter predation upon them. These authors estimated that 8-10 family groups were present. More recently, otter signs have been also recorded on the River Rapti, near its confluence with the River Narayani (Acharya, 1998).

Although, as a top predator, the otter is considered to be an indicator of the health of aquatic habitats (Foster-Turley *et al.*, 1990; Yoxon, 2007), till now its conservation has not been considered a priority in Nepal. Increasing hunting for fur and habitat fragmentation are now threatening its survival in many areas, especially in several Asian countries (Yonzon 2006; Yoxon, 2007). Knowledge about habitat preference and ecological requirements is of consider-

able importance in developing effective conservation and management strategies (Kruuk, 2006; Acharya and Rimal, 2007).

This study, whose main aim was to investigate the distribution and habitat ecology of the smooth coated otter, was carried out on the River Narayani, inside Chitwan National Park (CNP; 27° 34' to 27° 68' N and 83° 87' to 84° 74' E) and the surrounding buffer zone from the northern boundary of the park (Sikrauli) to Tribeni barrage, next to the border with India. Climate is subtropical with a summer monsoon and a relatively dry winter.

In January and June 2009, otter distribution was assessed by the standard method, i.e. by searching for otter signs (spraints, footprints, dens, resting and grooming sites) along both banks of 600 m long river stretches. Sampling stations were 1.5-2 km apart. Sampling started from Sigrauli Ghat, at the northwestern boundary of CNP and ended at Tribeni Ghat, covering about 75 km of river. It was carried out with the aid of three boats wherever the river was not accessible by foot. The studied stretch was divided into 6 zones. ArcGIS 9.0 was used to map all otter signs. The maximum length and width of footprints were measured by a ruler. Distance from the water edge and the type of substrate were recorded for each otter sign found, as well as depth and width of the nearest watercourse.

In January 2009, otter signs were recorded in zones 2 and 3 (Fig. 1). Most signs were found along braided channels characterized by low water current and depth, and separated from the main river course by high sandy banks. Both banks and sandy islands were densely covered by *Saccharum* sp. Otter signs were also recorded along the eastern branch of the River Narayani. In June, otter signs occurred only in zone 2 (Gidha-Dibyapuri), mainly near the confluence of shallow branches with the main river course and on sandy islands. The lower number of otter signs found in to January may have depended on the higher river discharge

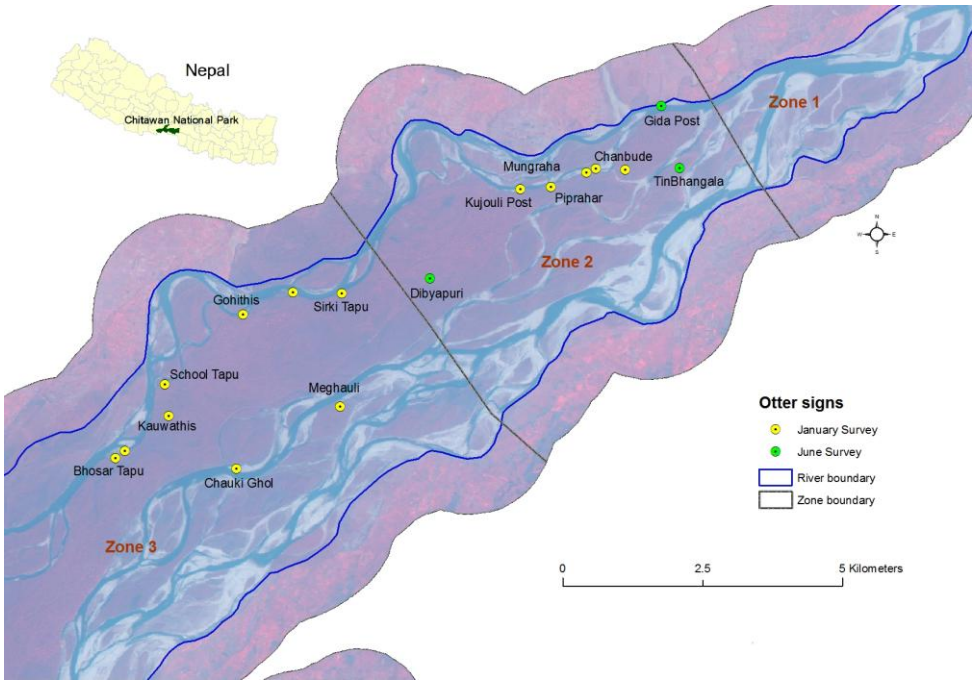

Figure 1 - Distribution of otter signs in the study area.

and consequent submersion of riparian areas. Otter distribution agreed with the reported otter preference for lowland marshes, swamps and bogs interconnected by meandering streams (Melquist and Hornocker, 1983).

Evidence of otter presence was not recorded in the downstream half of the study area (Amaltari-Tribeni). Although the smooth coated otter is rather tolerant of the presence of man (Shariff, 1984; Anoop and Hussain, 2004), fishing and gravel / sand extraction may play a major role in determining otter absence. Moreover, in this part of the river there is a large dam (Tribeni), which, by impeding fish migration (Holmquist *et al*, 1998; Collares-Pereira *et al*. 2000), may reduce their availability to otters (Macdonald and Mason, 1985; Foster-Turley et *al*., 1990).

The otter was also absent on the downstream regions of the River Narayani, such as the rivers Kathona, Vellogi and Kanha, although these watercourses seemed to be suitable for the mustelid.

Otter footprints occurred mostly on either muddy or sandy shorelines of channels which are 0.45-6.96 m (1.60 ± 1.31, N = 21) deep and 22.5-272 m (65.15 ± 67.77, N= 13) wide. All fresh tracks were located between 0.3 and 1.5 m (0.943 ± 0.362, N = 21) from the water, especially next to marshes or the confluence of small channels with the main watercourse along the western boundary of the park (Nawalparasi district).

It was not possible to assess otter abundance on the basis of footprints, because the dry climate preserved old tracks. Footprint length ranged between 7 and 11 cm (9.22 ± 1.05, N= 16), while width ranged between 7 and 8.5 cm (7.53 ± 5.14, N= 16). As the size of footprints can vary with the texture of the substrate, all recorded measures are likely to correspond to adult specimens.

Spraints were cylindrical and, when fresh, were black-coloured and have a pleasant, sweet-musky smell. Old faeces were grey to white. Spraints were found mainly on dry sandy banks of islands covered by *Saccharum* sp. and next to the confluence of river branches.

Marking sites were 1.8-7.2 m (3.75± 1.97, N= 8) from deep stretches of the river, 0.75-2.4 m (1.82 ± 0.48, N= 8) in depth. The smooth coated otter has been reported to mark well above the water-line (Kruuk 2006); accordingly, the height above water level of sprainting sites was 0.9-2.4 m (1.36 ± 0.54, N= 8).

Otters groom by vigorously rubbing their fur on the ground surface (Melquist *et al.*, 2003; Anoop and Hussain, 2004). Seven grooming sites were recorded on sandy islands and banks. Grooming sites were found between 0.9 and 9 m (4.97 ± 3.1, N= 7) from water.

If we assume that the distribution of otter signs is an indicator of habitat use (Clavero *et al*., 2006), the otters' preference for densely-covered, sandy islands between shallow, low-water channels probably reflects the higher availability of fish and resting sites during monsoons. Currently, increasing human disturbance - through fishing, cattle grazing, sand extraction and pollution – is likely to be the main threat to otter conservation. Management should be directed to the conservation of riparian areas suitable to smooth coated otters.

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