

REPORT

PHOTOGRAPHIC EVIDENCE OF SMOOTH-COATED OTTER *Lutrogale perspicillata* IN KOSHI TAPPU WILDLIFE RESERVE, NEPAL

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Abstract: Smooth-coated otter *Lutrogale perspicillata* is one of the three otter species occur in Nepal. They were believed to be extirpated from central and eastern Nepal. Camera traps set to study fishing cats in the buffer zone area of Koshi Tappu Wildlife Reserve recorded smooth-coated otters, confirming their presence in the protected area. Single individuals of smooth-coated otter were recorded at two locations in three detections. The recorded locations lie at the elevated edge of *Typha elephantina* dominated swamps, created from the Koshi River seepage near the Koshi embankment. Regular monitoring and conservation efforts for the smooth-coated otter are needed to ensure their survival in Koshi.

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Keywords: Smooth-coated otter, Koshi Tappu Wildlife Reserve, community fish ponds, Buffer Zone, Nepal, Camera trapping

INTRODUCTION

The status of the three species of otters purported to inhabit Nepal is unclear. The presence of the smooth-coated otter (*Lutrogale perspicillata*) in the lowland Terai is well documented (e.g. Acharya and Lamsal, 2010; Acharya, 2016; Joshi et al., 2021). The Eurasian otter (*Lutra lutra*) was recently reported at higher elevations in the country after an absence of three decades (Basnet et al., 2020; Shrestha et al., 2021). The small-clawed otter (*Aonyx cinerea*) has been anecdotally reported in Nepal (Kafle, 2009; Jnawali et al., 2011) but has not been confirmed since the 19th century (Hodgson 1841).

The smooth-coated otter is the only extant representative of the genus *Lutrogale* (White 2004). It is a globally threatened otter species, listed as 'Vulnerable' in the IUCN Red List (Khoo et al., 2021) and Appendix I of CITES (2021), with patchy distribution across South and Southeast Asia (Khoo et al., 2021).

In Nepal, the smooth-coated otter is an endangered species but not included in the protected list of the National Parks and Wildlife Conservation Act, 1973 (Jnawali et al., 2011). Recent surveys suggest their distribution is restricted to the western Terai primarily in Bardia and Shuklaphanta National Parks. Habitat conditions within their distribution range appears to be declining continuously (Jha, 2018). A study carried out in Koshi Tappu Wildlife Reserve in 2002 found no sign of otters (Jha et al., 2020) and there has been no evidence of their presence in the KTWR since. Here, we present photographic evidence of smooth-coated otters in fish farming areas in the buffer zone of Koshi Tappu Wildlife Reserve.

MATERIALS AND METHODS

Study area

This study was carried out in eastern Buffer Zone of Koshi Tappu Wildlife Reserve (KTWR, location: 86°55' - 87°05' E and 26°34' - 26°45' N) in southeastern Nepal (Figure 1). KTWR, established in 1976, covers an area of 175 km² and became the first Ramsar site of Nepal in 1987. An additional 173 km² surrounding the reserve was declared a buffer zone in 2004. The reserve provides habitat for many globally threatened mammals, reptiles and birds including wild water buffalo *Bubalus arnee*, fishing cat *Prionailurus viverrinus*, gharial crocodile *Gavialis gangeticus*, Bengal florican *Houbaropsis bengalensis* (Chettri et al., 2013). KTWR is characterized by a freshwater ecosystem with sand beaches, grasslands and forest patches and lies in the floodplain of the snow-fed Koshi River, the largest river of Nepal and a major tributary of the Ganga River. However the land cover is changing rapidly and wetlands are decreasing due to anthropogenic and climatic factors (Chettri et al., 2013; Chaudhary et al., 2016) affecting the entire wetland ecosystem (Mishra et al., 2020; 2021).

In the eastern buffer zone of the KTWR an area of continuous wetlands is formed by the water seepage through the embankment of Koshi River. It provides habitats for several species of fishes, amphibians, crustaceans, molluscs, birds and small mammals (Mishra *et al.* 2021). Communities have converted most of this seepage area within their private land into the fish farms. These farms are also frequently used by aquatic fauna such as fishing cat, otters, crocodiles, and birds, leading to intense human-wildlife interaction.

Camera trap survey

We conducted a camera trap survey during the monsoon and post-monsoon season (July–November) in 2021. The survey was primarily targeted at fishing cats to monitor their movement around the fishponds in eastern BZ of KTWR. We set digital motion sensor cameras (Bushnell Trophy Cam HD) in 3 sites 5 kilometer apart (5 cameras in site A and two cameras each in Site B and C) (Figure 1). The distance between the camera locations within each site varied from 200–500 m. Since the cameras were location within a 500 m area, we considered the images collectively as representing a single locality. Camera traps were active day and night for 4 months and checked twice a week. The camera traps were programmed to take either 3 photos per trigger or a video of 20 seconds. GPS coordinates were recorded during the camera installation using a Garmin eTrex 10 GPS receiver. Data was downloaded in systematic folders and sorted by species. Standard detection rate (number of detections of a species per 100 trap nights) was calculated.

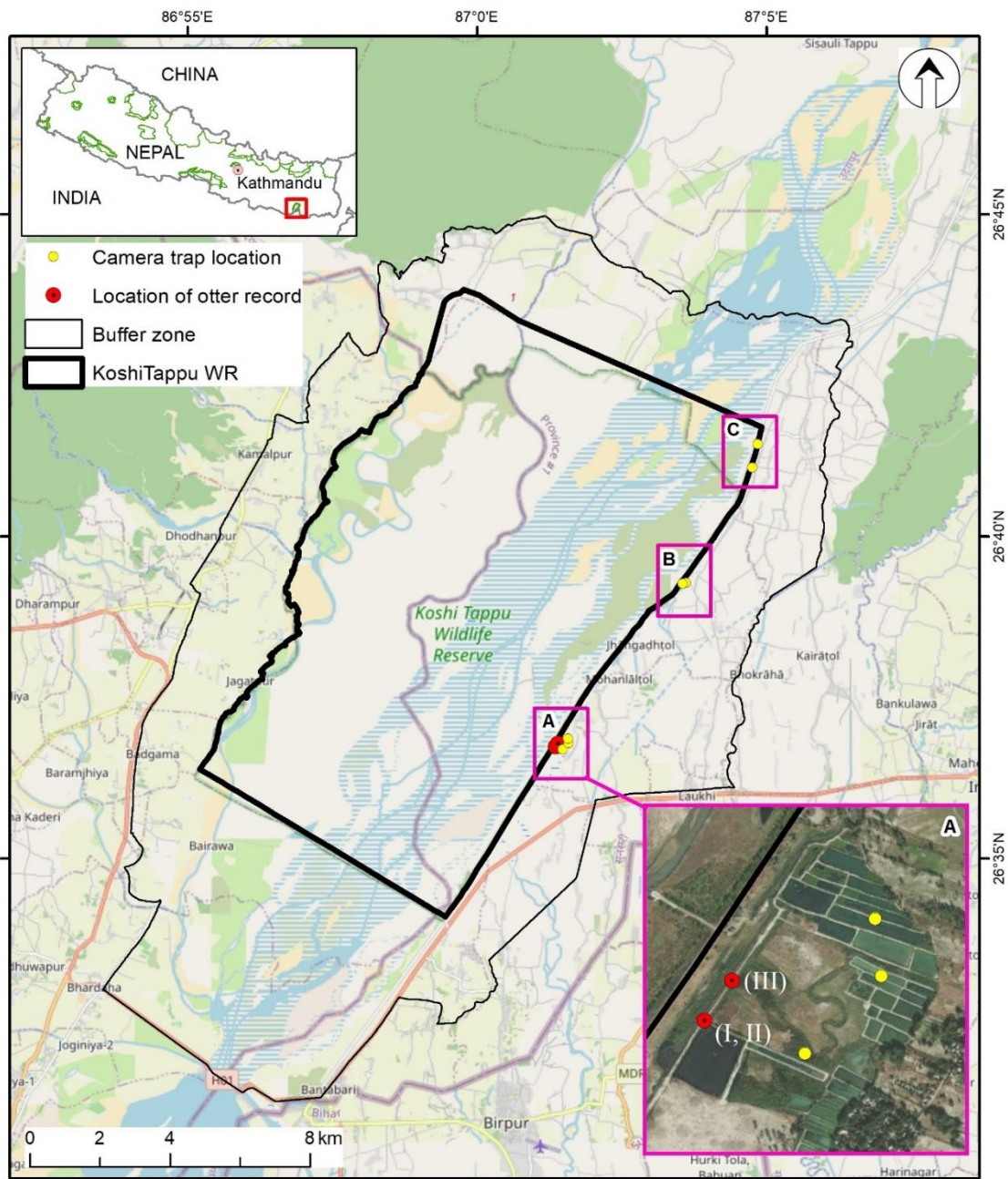


Figure 1. Study area showing camera trap stations and recorded location of otters. A, B, C in the map represent three different sites where camera traps were installed and I, II & III represents the otter capture event as per the details provided in Table 1.

RESULTS

Three independent detections of smooth-coated otters at 2 locations were obtained in camera traps with a total effort of 360 trap days. The camera traps recorded video clips, 20 second long in each detection of a single individual (Figure 2). We could not identify the individuals and sex, thus, could not confirm whether it is the same individual recorded repeatedly, or, different individuals. The other species captured in camera traps were Asian elephant *Elephas maximus*, wild water buffalo, fishing cat, jungle cat *Felis chaus*, small Indian civet *Viverricula Indica*, common palm civet *Paradoxurus hermaphroditus*, golden jackal *Canis aureus*, Indian crested porcupine *Hystrix indica*, rhesus monkey *Macaca mulatta*, marsh mugger crocodile *Crocodylus palustris*, a few rodents and several species of birds. Besides wildlife,

camera traps had also recorded humans, domestic cats and dogs, goats, buffaloes, and cattle.

Table 1. Capture events of Smooth-coated otter in camera traps

Otter capture event	Date	Time	Location	No. of Individuals	Habitat
I	8/27/2021	05:51	Site A (Kusaha1)	1	Fish farming area
II	9/23/2021	04:07	Site A (Kusaha1)	1	Fish farming area
III	11/6/2021	17:56	Site A (Kusaha2)	1	Fish farming area



Figure 2. Smooth-coated otter photographs from video recorded in camera trap a) otter photo in the morning, b) local farmer caught in camera within 6 minutes of otter movement, and c) otter record in same location next month.

DISCUSSION

We present conclusive evidence of smooth-coated otters from the buffer zone of KTWR in the eastern Terai of Nepal, in a camera trap survey for fishing cats. Both fishing cats and otters are wetland habitat specialists, sharing wetland habitats.

Camera trap surveys conducted in 2016 and 2017, with a trap effort of 140 and 385 active trap days respectively, were unsuccessful in confirming otter presence in the Koshi Tappu area (Mishra et al., 2021). No detection of otters at that time could be due to their low density or a short camera trapping period (7-10 days at a location and 2 months of total survey period). However, otters may have been locally extinct and recolonized in the Koshi Tappu area. The survey of Mishra et al. (2021) was conducted in the dry season (November-January) when the water level in the Koshi River was low in comparison to the monsoon and post-monsoon flooding season.

No otter scats were observed during the survey, suggesting that otters are rare in KTWR. Many of the swamps in the area are now converted into commercial fish farms, and otters may be using this habitat for foraging, as described by Hussain and Choudhury (1997). In addition to the images of otters from this survey, several fish farmers reported the sighting of an individual otter foraging in their fish pond area during the time period of our survey. In an informal interview with the first author, one of the farmers also reported seeing four otters together at the same locality in October, 2021.

The wetlands in the Terai of Nepal face many threats, including the construction of irrigation dams, uncontrolled groundwater pumping, dumping of untreated industrial waste in water source, domestic sewage, pesticides and herbicides, use of chemical fertilizers in agricultural field, sedimentation and eutrophication (Karki and Thomas, 2004). In Koshi Tappu, sand and gravel extraction, driftwood collection, overfishing using gillnets and/or electrocution, all have an adverse impact on species abundance and diversity in these wetlands (Karki and Thomas, 2004).

Our study confirms that the existence of smooth-coated otters in Koshi Tappu. We could not confirm whether otters remained in the Koshi undetected by researchers or it was extirpated for some years and recolonized in Koshi. The occurrence of otters in the fish farming sites and their predation on fish suggests persecution threats from fish farmers. Conservation efforts for the smooth-coated otter and awareness among stakeholders, including local fish farming communities, are urgently needed to ensure their survival. Regular monitoring of otters and other aquatic fauna should be conducted. A detailed study of smooth-coated otter ecology and interaction with fish farming communities is recommended to foster otter conservation in the highly human-dominated landscape like Koshi Tappu.

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RESUME

PREUVE PHOTOGRAPHIQUE DE LA LOUTRE A PELAGE LISSE *Lutrogale perspicillata* DANS LA RESERVE DE FAUNE SAUVAGE DE KOSHI TAPU AU NEPAL

La loutre à pelage lisse *Lutrogale perspicillata* est l'une des trois espèces de loutres présentes au Népal. On pensait qu'elles avaient disparu du centre et de l'est du Népal. Des pièges photographiques installés en vue de l'étude du Chat viverrin dans la zone tampon de la réserve faunique de Koshi Tappu ont enregistré des loutres à pelage lisse, confirmant leur présence dans la zone protégée. Des individus isolés de loutres à pelage lisse ont été enregistrés sur deux sites, lors de trois détections. Les sites d'enregistrement surplombent les marécages dominés par *Typha elephantina*, créés par les suintements de la rivière

Koshi près du remblai de Koshi. Des efforts réguliers de surveillance et de conservation de la loutre à pelage lisse sont nécessaires pour assurer sa survie à Koshi.

RESUMEN

EVIDENCIA FOTOGRÁFICA DE NUTRIA LISA *Lutrogale perspicillata* EN LA RESERVA DE VIDA SILVESTRE KOSHI TAPPU, NEPAL

La nutria lisa *Lutrogale perspicillata* es una de las tres especies de nutria que viven en Nepal. Se cree que fue extirpada de Nepal central y oriental. Cámaras-trampa dispuestas para un estudio de gatos pescadores en la zona buffer de la Reserva de Vida Silvestre Koshi Tappu, registraron nutrias lisas, confirmando su presencia en el área protegida. Se registraron individuos solitarios de nutria lisa en dos locaciones, en tres detecciones. Las locaciones se encuentran en el borde elevado de los pantanos dominados por *Typha elephantina*, creados a partir de la infiltración del Río Koshi cerca del terraplén Koshi. Se necesitan monitoreo regular y esfuerzos de conservación para la nutria lisa, para asegurar su supervivencia en Koshi.

सारा

खैरो ओत अर्थात 'स्मुथ कोटेट ओटर' नेपालमा पाइने तीन ओत प्रजाति मध्ये एक हो। यसको वैज्ञानिक नाम लुट्रोगेल पर्स्पिसिलटा हो। खैरो ओतलाई मध्य र पूर्वी नेपालबाट लोप भएको आशंका गरिएको थियो। कोशी टप्पु वन्यजन्तु आरक्षको मध्यवर्ती क्षेत्रमा मलाहा बिरालो अर्थात 'फिसिङ क्याट'को अध्ययन गर्न राखिएका स्वचालित क्यामेरा ट्रयापहरूले तिनीहरूको उपस्थिति पुष्टि गर्दै खैरो ओत रेकर्ड गरेका हुन्। दुई स्थानहरूमा जम्मा तीनपटक खैरो ओतको तस्वीर कैद भएका छन्। रेकर्ड गरिएका स्थानहरू कोशीको तटबन्धन नजिकै पटेर 'टाइफा एलिफेन्टिना'को प्रभुत्व भएको सीमसार क्षेत्रमा अवस्थित छन्। कोशीमा खैरो ओतको अस्तित्व सुनिश्चित गर्नको लागि तिनीहरूको नियमित अनुगमन र संरक्षण गतिविधिहरू आवश्यक छ।