

REPORT

EURASIAN OTTER (*Lutra lutra*): EXPLORING EVIDENCE IN NEPAL

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Abstract: The Eurasian otter (*Lutra lutra*) has been reported to be widely distributed in mountain wetlands of Nepal, though recent records have been scarce. The species is categorized as Near Threatened in the National Red List Assessment estimating its population as 1,000-4,000 individuals which is not based on a comprehensive status survey. Here, we review the past reports of the status and distribution of Eurasian otters in Nepal, and provide an update on the basis of literature review and a limited test surveys of some wetlands. We conclude that there has not been a single verifiable and conclusive record of the Eurasian otter in Nepal in recent years. Recent verifiable reports of otters have been entirely of smooth-coated otters. We suggest that there may have been a dramatic countrywide decline of Eurasian otter from their former ranges. Anthropogenic threats, illegal trade and habitat degradation threaten otter species throughout Asia, and reliable scientific and genetic studies are needed to get clear understanding of Eurasian otter status in Nepal.

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INTRODUCTION

The Eurasian otter (Linnaeus, 1758) has one of the widest distributions of all Palearctic mammals (Corbet, 1966). Its range extends from Ireland in Western Europe to the Kamchatka Peninsula in eastern Asia, from the Arctic region to north Africa and as far south as Sumatra and Indonesia in Southeast Asia (Hung and Law, 2016). Due to human pressures, Eurasian otters disappeared from or became endangered in most parts of Europe in the 20th century, but are now recovering in many areas (Crawford, 2003; Prigioni et al., 2007; López-Martín and Jiménez, 2008; Loy et al., 2010). In East Asia, the species was declared extinct in Japan in 2012 (Ando, 2008; Hance, 2012) but in 2017, the first record of the species in 38 years was made with a single camera trap photograph (Japan Times, 2018). The species is declining drastically in China (Li and Chan, 2017) and there have been no recorded sightings since the early 1990s in many countries, including Bangladesh, Indonesia, Cambodia and Vietnam (Yoxon and Yoxon, 2019). Less detailed information from Russia and most parts of Asia suggests that in many countries both abundance and range appear

to be in decline (de Silva, 1995; Duplaix and Savage, 2018). The species is listed as Near Threatened by the IUCN Red List and on Appendix I of the Convention on International Trade in Endangered Species (CITES) (Roos et al, 2015).

In Nepal, lack of verifiable data and scant documentation may have resulted in an unclear picture of population status and distribution of Eurasian otters. The presence of the species has been reported in a number of studies in recent decades (Yonzon 1998; Acharya and Gurung 1991, 1994; Acharya, 1997, 2000, 2006; Acharya and Rimal, 2007; Kafle, 2009, 2011). It was predicted to be widely distributed in Mountain Rivers and wetlands (Yonzon, 1998; Acharya 2006; Kafle, 2009; Acharya et al., 2010; Acharya and Rajbhandari, 2011; Jnawali et al., 2011; Acharya and Rajbhandari, 2012a,b). It is categorized as Near Threatened on the National Red List Assessment of Nepal, which estimates its population as 1,000-4,000 individuals, but this estimate is not based on a comprehensive status survey (Agenda Survival, 1991; Jnawali et al., 2011). The species is not included on the protected list of the National Parks and Wildlife Conservation Act (1973), which restricts killing, hunting and capturing animals and imposes regulations to curb illegal trade. However, the 2002 Amendment of the Aquatic Life Protection Act (1961) gives legal protection to two species of otters, the Eurasian otter and smooth-coated otter, both within and outside protected areas (Acharya and Rajbhandari, 2011, 2012c). Nepal is also a signator of CITES, which forbids trade in the Eurasian otter.

Here we review information from recent research on otters in various physiographic zones of Nepal to assess whether there is current incontrovertible evidence of Eurasian otter presence in the country.

LITERATURE REVIEW

Published articles, thesis reports, management plans and Environmental Impact Assessment reports from plausible otter locations were assessed. Eurasian otters have been reported from the following protected areas in Nepal: Annapurna Conservation Area, Makalu Barun National Park(NP), Koshi Tappu Wetland, Rara NP, Bardia NP, Ghodaghodi Lake Area as well as 21 districts: Saptari, Sunsari, Chitwan, Bardia, Kapilvastu, Bara, Kailali, Kanchanpur, Kaski, Bajhang, Bajura, Ilam, Panchther, Taplejung, Gorkha, Lamjung, Myagdi, Mugu, Solukhumbu, Manang and Sankhuwasabha (Kafle, 2009; Thapa Chhetry and Pal, 2010; Acharya and Rajbhandari, 2011a; Jnawali *et al.* 2011), and the Arun River, Seti River and its tributaries, Bote Kosi River and Tama Kosi River (K. Saha, 2011 pers. comm. with P. Acharya). Some of these studies used direct sightings or indirect signs (tracks, scats, dens, resting sites, slides and grooming sites) to document their presence (Acharya and Gurung, 1991, 1994; Yonzon, 1998; Acharya et al., 2010, Acharya and Lamsal, 2010; Thapa Chhetry and Pal, 2010; Acharya and Rajbhandari 2011, 2012a, b, d; Paneru, 2014), but many were based on community perception surveys (Agenda Survival, 1991; Acharya 1997; Bhandari and G.C.,2008; Kafle, 2009, 2011; Acharya & Rajbhandari, 2011; Jnawali et al., 2011; Acharya, 2016, 2017).

Photographic evidence of the smooth-coated otter has been taken from the Khauraha, Geruwa and Karnali Rivers of the Karnali River System in Bardia National Park (Acharya, 2016, 2017; Jha 2018), the Babai River of Babai Valley (Acharya and Rajbhandari, 2012d; Bhandari, 2019), and Suklaphanta National Park (Thapa, 2019), all appearing to be suitable otter habitats. Yet there is no recent photographic evidence of Eurasian otters from these areas. The only photographic evidence of Eurasian otters dates from the early 1990s, from Rupa and Begnas Lakes of Kaski District. Eurasian otters appeared to be common then, but anthropogenic pressures from fisherman were rising at that time (Acharya and Gurung, 1991; 1994). After more than a decade,

preliminary survey along with sign survey conducted by Bhandari and G.C. (2008) did not confirm Eurasian otter presence at the site.

Eurasian otters were reported in the West Seti River Valley by Yonzon (1998). Bolton (1976) recorded the presence of Eurasian otters in Lake Rara of Rara National Park in far Western Nepal. The Eurasian otter was a species of concern for local conservation efforts, as significant number of otters were killed by traditional hunters from Humla and Jumla Districts to sell their pelts in India (Yonzon, 1998). Since that time no otter monitoring has been carried out on the Seti River and Rara Lake area, and so no positive reports of Eurasian otters have been recorded recently.

Kafle (2009) and Jnawali et al. (2011) reported the presence of Eurasian otter in Makalu Barun National Park, based on infrequent sightings and key informant's reporting. A study of small carnivores, carried out by Ghimire (2010) with extensive sign surveying, camera trapping and a social survey for over a year and a half in Makalu Barun National Park did not record the presence of Eurasian otters. Nor did a camera trap survey carried out in 2017 to study small carnivores of Tinjure-Milke Forest (Rai et al., 2018). The recent management plan for Sagarmatha National Park and its buffer zone, which covers Solukhumbu District, does not include otters (SNPO, 2016).

A survey of wetlands carried out in Koshi Tappu Wildlife Reserve, which covers part of Sunsari, Saptari and Udayapur Districts of the eastern Nepal, did not record any indirect sign or sightings of Eurasian otters (Acharya, 2002). Another survey of Koshi Tappu, carried out from July 2002 to June 2004 by Thapa Chhetry and Pal (2010) claimed that both smooth-coated otters and Eurasian otters were present based on indirect evidence, but a study in 2013 confirmed the presence only of smooth-coated otters (Chettri et al., 2016). A 2016 camera trap survey carried out to study fishing cat in fish ponds in the Sunsari District and along the Sunsari River recorded several small carnivores, but no otter species (Dahal et al., 2017). A survey carried out in Ghodaghodi Lake Complex area of far western Nepal found no sign of otters (Acharya, 2002). A study in 2007 (Lamsal et al., 2014) claimed the presence of Eurasian otter through direct sightings and indirect signs, but more recent research by Kunwar (2019) in the same study area found no evidence of otters. A preliminary survey of Kanchanjunga Conservation Area, in Taplejung District recorded no species of otters (WWF, 2019). In Chitwan District, indirect signs based on size and shape of tracks claimed the presence of smooth-coated otters in the Narayani River in 2008 (Acharya et al., 2010), but evidence of Eurasian otter has never been recorded (Acharya et al., 2010; Acharya and Lamsal, 2010; Acharya and Rajbhandari, 2012a).

A test case field survey

We conducted a limited survey to search for Eurasian otter presence in some areas where they had been previously reported. From December 2018 to January 2019, we conducted an otter survey along the Budigandaki River and adjoining streams that lie in Bhimsen Rural Municipality and Sahid Laxman Rural Municipality of Gorkha District (Figure 1). Different from our study site, Kafle (2011) used social surveys and observation of scat in streams of the Pyaudikhola Watershed and Kapring Khola Watershed of Marsyangdi River in the same district. He reported otter presence based on local people's perception and characteristics of the scat he collected: dark grey, with fragments of fish, frog and crab remnants, fragile, and smelling of fish. We sought otter sign (e.g., latrine sites, tracks, scats and dens) on 7 transects of 1 km each along river bank. The transects were chosen purposively based on our key informant and preliminary surveys. Surveys covered adjacent 5 meters of both sides of transect. The survey was conducted in December when river was low and sand banks were

remained exposed. Following the sign survey, seven field cameras were also placed in location of likely otter activity for a total of 140 camera working days and nights.

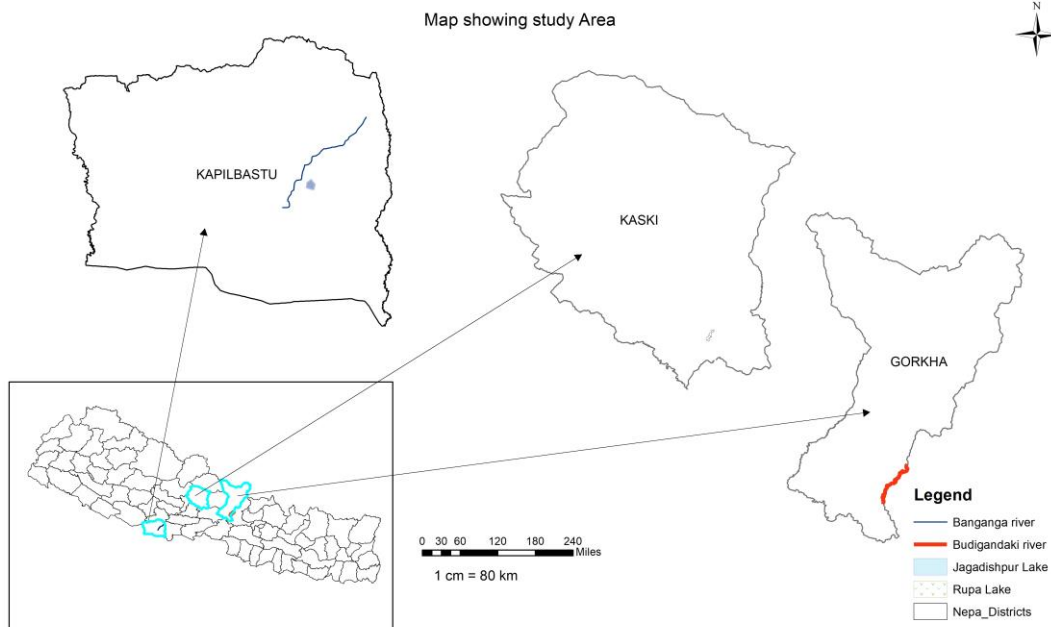


Figure 1: Map of Nepal showing field surveyed sites for *Lutra lutra*

Key informants were interviewed and local people were surveyed using a semi-structured questionnaire to a sample of 70 purposively selected households living in the vicinity of the River. The perception of respondents towards the otter was measured in strongly agree to strongly disagree (1-5) Likert scale format proposed by Babbie (1995). Chi-square test and likelihood ratio test were also used to understand perception of respondents and relationship between different variables. No sightings, signs and photographs of otters were recorded in our survey and also older aged respondents have supported the statement of declination of otter in the present (Since likelihood ratio = 30.325*, calculated P -value 0.002 is less than the tabulated value 0.05) which is probably as the distribution of otters along the watersheds has diminished compared to few decades back. Our questionnaire survey revealed that local people older than 60 years who had sighted otters long ago have not seen otters in the area in the last two decades. Almost entire respondent did not accepted killing otter and no any body parts of otter are owned or used as medicine in the study area. Since the crab-eating mongoose shares the otter's ecological niche, including foraging for crabs (Kruuk, 2006; Thapa, 2013; Rahut, 2013), otter scat may be confused with crab-eating mongoose scat. The questionnaires revealed that many local people confused otters with crab-eating mongooses (*Herpestes urva*). Without genetic analysis, we believe it is difficult to positively identify the scat to species based on visual traits alone.

Similar methods were used in Kapilvastu District of the Western lowlands of Nepal, at Jagadishpur Reservoir (a Ramsar site) and along the Banganga River, with 27 transects of 1 km each and camera trapping for 640 trap nights, from October 20 to January 10, 2018/19. Camera trapping effort of 640 trap nights and the transect survey around the Banganga River and adjoining rivers and Jagdishpur Reservoir (a RAMSAR site) was conducted based upon the focused group discussion with the old people and the local hunters of that area regarding the presence of otters in the site. The study revealed evidences of several small carnivores but no evidence of otters.

A preliminary survey along with sign survey was conducted in Begnas and Rupa Lakes of the Pokhara Valley following informal discussion with locals in

March, 2018. The signs of otter was sought along the bank of lakes by continuous survey. The study could not find any evidence of Eurasian otter from the study sites. Local people had mixed perspectives about the presence i.e. older respondents reporting presence of otter before two decades and younger generation don't know about otters and their presence in recent years in the area. The only photographic evidence of Eurasian otters from Nepal is of Rupa lake which dates back to early 1990s (Acharya and Gurung, 1991).

Threats to otters in Nepal

The decline of Eurasian otters in Nepal is likely due to anthropogenic disturbances. In recent decades, populations of all species of otters in Nepal have declined largely because of degradation of natural habitats and hunting (Acharya and Gurung, 1991; Acharya 1997; 2006; 2016, 2017; Acharya and Lamsal 2010; Acharya and Rajbhandari, 2011). Otter habitat is threatened by extraction of sand and stones from bank sides, overfishing, poisoning of prey species, the use of bombs thrown in the river for fishing, removal of shoreline vegetation, firewood and grass cutting, livestock grazing, construction of irrigation intakes, sedimentation, construction of dams, frequent activity of people on river banks, and industrial and agricultural pollution (Acharya and Lamsal, 2010; Acharya, 2017).

Illegal poaching also threatens otters in the country. From 1989 to 2017, 755 skins were seized from poachers in Nepal (Shrestha and Savage, 2018). Although it is unclear how many of these are Eurasian otters because of the difficulty of identifying pelts to species level. In recent decades, populations of all species of otters in Nepal have declined largely because of hunting and loss of natural habitats (Acharya and Gurung, 1991; Acharya 1997; 2006; 2016, 2017; Acharya and Lamsal 2010; Acharya and Rajbhandari, 2011). They are hunted for their pelt, meat and internal organs for indigenous medicine (IOSF, 2014). In Rupa and Begnas Lakes, otters were killed by trapping with nets, or by chasing the animal to exhaustion and then shooting it (Agenda Survival, 1991; Acharya and Gurung, 1994).

The 1961 Aquatic Life Protection Act provides for some legislative protection for aquatic habitats, prohibiting the use of poisonous or explosive materials into a water source, or destroying any dam, bridge, fish ladder or water system with the intent of catching or killing aquatic life. Thus far, however, there has been no reported case of a person being prosecuted under the Act (Belbase, 1999). A recent amendment to the act has added smooth-coated and Eurasian otter species to the protected species list (Nepal Gazette, 2002), which may be crucial in protecting the biodiversity of aquatic systems through interagency cooperation (Acharya, 2006b).

CONCLUSIONS

A thorough review of the literature on Eurasian otters in Nepal and limited field surveys suggest that there has not been a single verifiable and conclusive record of the Eurasian otter in Nepal in recent years. Recent reports of otters in the country have been entirely of smooth-coated otters, for example in Karnali River system in Bardia National Park and the wetlands of Suklaphanta National Park. We suggest that populations of Eurasian otters have undergone a dramatic countrywide decline. At present, the lack of data to assess the true status of Eurasian otters in Nepal can only be remedied by scientific and genetic surveys.

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RÉSUMÉ

LA LOUTRE EURASIENNE (*Lutra lutra*) : RECHERCHE D'INDICES DE PRESENCE AU NÉPAL

Bien que les informations récentes soient peu nombreuses à ce sujet, la loutre Eurasiennne (*Lutra lutra*) serait largement répandue au Népal dans les zones humides de montagne. L'espèce est considérée comme quasi menacée au niveau de la Liste rouge nationale. L'estimation de la population, non fondée sur un suivi exhaustif, serait de 1 000 et 4 000 individus. Dans la présente publication, nous passons en revue les rapports antérieurs sur le statut et la répartition des loutres eurasiennes au Népal et fournissons une mise à jour sur base d'une revue de la littérature et d'un nombre limité de suivis tests de certaines zones humides. Nous concluons qu'il n'y a pas eu une seule donnée fiable et convaincante sur la loutre eurasiennne au Népal ces dernières années. Les rapports fiables récents sur les loutres concernent uniquement la loutre à pelage lisse. Nous suggérons donc qu'il y ait peut-être eu un déclin dramatique à l'échelle nationale de la loutre eurasiennne par rapport à son ancienne aire de répartition. Les menaces anthropiques, le commerce illégal et la dégradation de l'habitat menacent les espèces de loutres dans toute l'Asie. Des études scientifiques et génétiques fiables sont nécessaires afin de bien comprendre le statut de la loutre eurasiennne au Népal.

RESUMEN

LA NUTRIA EURASIÁTICA (*Lutra lutra*): EXPLORANDO EVIDENCIAS EN NEPAL

Se ha informado que la nutria eurasiática (*Lutra lutra*) está ampliamente distribuida en los humedales de montaña de Nepal, aunque son escasos los registros recientes. La especie está categorizada como Casi Amenazada en la Evaluación Nacional de Lista Roja, estimándose su población en 1.000-4.000 individuos, lo que no se basa en un relevamiento sistemático de su status. Aquí, pasamos revista a los informes pasados de status y distribución de la nutria eurasiática en Nepal, y proporcionamos una actualización sobre la base de revisión bibliográfica y relevamientos limitados de algunos humedales. Concluimos que no ha habido ni un solo registro verificable y concluyente de la nutria eurasiática en Nepal en años recientes. Los informes verificables recientes de nutrias, son todos de nutria lisa. Sugerimos que puede haber habido una dramática declinación de la nutria eurasiática a escala de todo el país. Las especies de nutrias en toda Asia están amenazadas por factores antropogénicos, comercio ilegal y degradación del hábitat, y se necesitan estudios científicos y genéticos confiables para obtener un claro entendimiento del status de la nutria eurasiática en Nepal.

सारांशः

कालो ओतः नेपालमा प्रमाण खोज्दै

कालो ओत नेपालको पर्वतीय सिमसार क्षेत्रमा व्यापकरूपमा पाइने भनिएको भएपनि हालका रेकर्डहरू भने विरलै छन्। यस प्रजातिलाई नेपालको स्तनधारी बन्धुजन्तुको रातो सूचीमा संकट नजिक भनेर वर्गीकृत गरि यसको संख्या १,०००-४,००० अनुमान गरिएको छ जुन विस्तृत सर्वेक्षणमा आधारित छैन। यस रिपोर्टमा हामीले सोधपत्रको अध्ययन र सिमसार क्षेत्रमा सीमित परीक्षण सर्वेक्षणको आधारमा नेपालमा कालो ओतको स्थितिबारे ब्याख्या गरेका छौं। हामी यस्तो निष्कर्षमा पुगेका छौं कि हालका वर्षहरूमा नेपालमा कालो ओतको एउटा पनि प्रमाणिकरण गर्ने निर्णायक रेकर्ड छैन। ओतहरूको हालको सम्पूर्ण रिपोर्टहरूले नेपालमा खैरो ओत पाइने प्रमाणित गर्छ। तसर्थ कालो ओतको संख्या देशव्यापीरूपमा गिरावट आएको हुन सक्छ भन्ने हाम्रो आंकलन छ। मानविक गतिविधि, अवैध व्यापार र बासस्थानको विनासले एशियाभरि ओतका प्रजातिहरूलाई खतरा निम्त्याएको छ। नेपालमा कालो ओतको स्थिति बुझ्न वैज्ञानिक र आनुवंशिक अध्ययन आवश्यक छ।