R E P O R T

ARTISANAL FISHING BYCATCH CONFIRMS THE NORTHERNMOST DISTRIBUTION OF EURASIAN OTTERS (*Lutra lutra*) IN NEPAL

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Abstract: In Nepal, there is limited information on the distribution and population status of Eurasian otters, hindering effective conservation planning. We organized focus group workshops in eight major settlements in the Sarkegad Rural Municipality of Humla District during April 2023, to document the presence and distribution of mammalian species in the region. In one of the workshops conducted in Dulli village, a participant shared information about an otter trapped in a fishing net in the Dulli Kuna section of Karnali River. This marked the first confirmed record of the Eurasian otter in Humla district, representing the northernmost distribution range for this species in Nepal. The fishing bycatch of the otter highlights the need for community-level conservation education and awareness-raising, as well as the regulation of fishing practices, which remained a major threat to the species in the region.
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INTRODUCTION

Otters, part of the family Mustelidae, are mammals adapted to aquatic, semi-aquatic, or marine environments. They serve as primary predators, playing a crucial role in regulating the populations of their prey, which encompass various species such as fish, crustaceans, invertebrates (Kruuk and Moorhouse, 1990), amphibians (Pagacz and Witczuk, 2010), reptiles, insects, birds, and small mammals (Lanszki and Sallai, 2006; Remonti et al., 2008). Otters hold a significant role in the conservation of aquatic habitats and are sensitive to pollution, making them particularly vulnerable to environmental contamination (Kafle, 2009; Yoxon and Yoxon, 2019; Jha et al., 2020). The Eurasian otter boasts one of the widest distributions among Palearctic mammals, spanning from Western Europe to Eastern Asia and from the Arctic to Southeast Asia (Loy et al., 2022). Despite its historical range, anthropogenic pressures resulted in local extinctions across Europe during the 20th century, but there have been ongoing recovery efforts (Foster-Turley and Santiapillai, 1990; Prigioni et al., 2007; Loy et al., 2022). In contrast, in China and numerous Southeast Asian countries, dwindling populations and absences prevail (Zhang et al., 2016; Li and Chan, 2018; Yoxon and Yoxon, 2019).

In Nepal, the existence of Eurasian otters is threatened by several major issues such as overfishing, the use of poison and electric fishing to increase fish catches, habitat loss and contamination, declining prey populations, and human activities along riverbanks, such as mining sand and stones (Kafle, 2009; Basnet et al., 2020; Shrestha

et al., 2023). Furthermore, as demonstrated by the confiscation of 755 otter skins between 1989 and 2017, the illegal otter pelt trade is a significant challenge (Savage and Shrestha, 2018). Compared to other large mammalian species, there is not as much research conducted in Nepal on otters thus information on otter status, distribution and extent of threats are still lacking. In Nepal, three out of the 13 otter species are found, namely the Smooth-coated otter (*Lutrogale perspicillata)*, Asian small-clawed otter (*Aonyx cinereus)*, and Eurasian otter (*Lutra lutra)* (Kafle, 2009; Jnawali et al., 2011; Jha et al., 2020). These otters inhabit various freshwater ecosystems, including rivers, lakes, and wetlands. The Eurasian otter is categorized as "Near Threatened" in the IUCN Red List of Threatened Species and is protected under CITES Appendix I (Loy et al., 2022).

STUDY AREA

The present study was conducted in Sarkegad Rural Municipality of Humla district, Karnali province, Nepal (Fig. 1). Karnali Province is the largest province in Nepal, which is home to approximately 2.3% of mammals, 2.1% of birds, 43% of amphibians, 22% of butterflies, and more than one-third of fish species in Nepal (Acharya and Paudel, 2020). The Karnali River, the longest river in Nepal, originates in west Tibet and flows through the Humla district. Sarkegad Rural Municipality, located in the middle section of Karnali River in Humla district has an average elevation of 1993 meters and is one of the most densely populated rural municipalities in Humla district, with a total population of 10,688 residents (NPHC, 2021). Sarkegad RM is divided into eight wards (the Ward is the smallest administrative unit in Nepal) of 15 settlements. The primary occupations in the region are subsistence agriculture, animal husbandry, and traditional trades in medicinal and aromatic plants (MAPs).

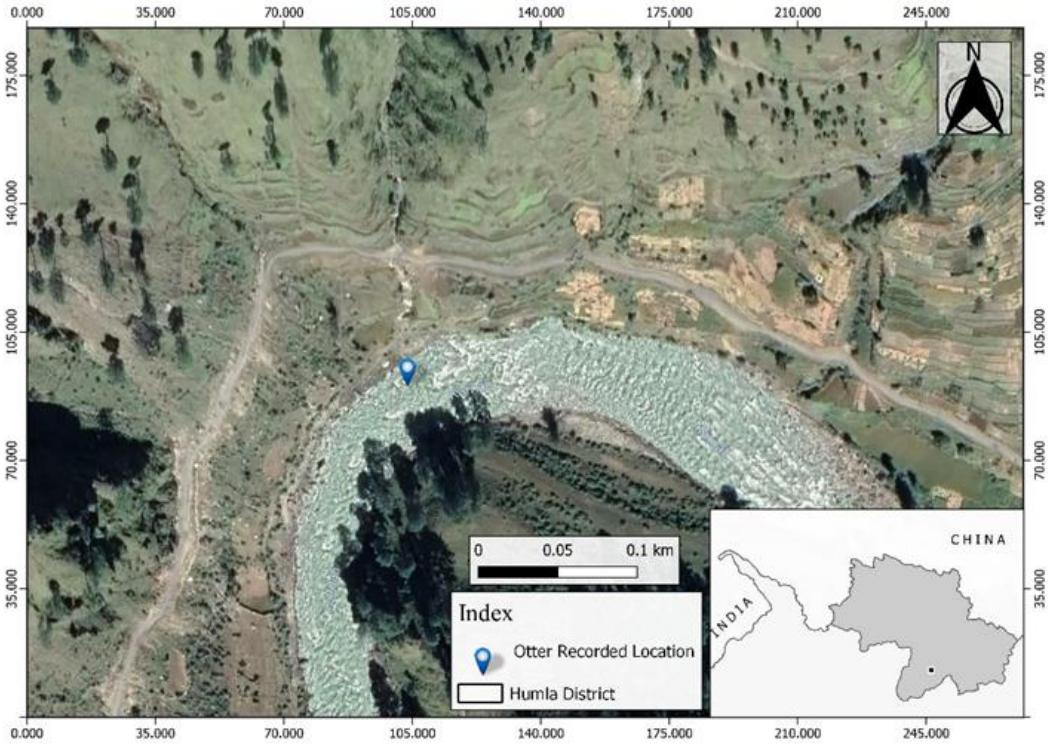

Figure 1. Eurasian otter capture location in Sarkegad Rural Municipality, Humla, Nepal

Sarkegad Rural Municipality is home to diverse wildlife, including the globally endangered Kashmir musk deer (*Moschus cupreus*), Himalayan black bear (*Ursus*

thibetanus), leopard (*Panthera pardus*), golden jackal (*Canis aureus*), blue sheep (*Pseudois nayaur*), Himalayan thar (*Hemitragus jemlahicus*), and birds such as Himalayan griffon vulture (*Gyps himalayensis*), Himalayan monal (*Lophophorus impejanus*), and Kalij pheasant (*Lophura leucomelanos*), among others (R. Lama and V. Thapa, *Observation*).

OBSERVATION

We organized eight ward-level workshops with representatives from all the settlements within Sarkegad Rural Municipality. We focused on wildlife species identification and distribution mapping using local knowledge, assessing the prevalence of human-wildlife conflicts, and identifying conservation threats. In remote areas with limited wildlife assessment studies, Local Ecological Knowledge (LEK) can prove to be a valuable resource for ecological information and has the potential to complement scientific data in the context of wildlife distribution mapping (Gandiwa, 2012).

A total of 87 participants from 12 villages participated in the workshops, including farmers (53%), herders (28%), and others (Community Forest Users Groups and ward members: 19%). In one of our workshops held on April 14, 2023, in Sarkegad, a participant from Dulli village mentioned an unusual animal caught as a bycatch in a fishing net (Fig. 1). Upon reviewing the pictures, we thought it resembled an otter, which was later confirmed by direct observation of the carcass, and locals' confirmation that it was an otter (Fig. 2). This was later verified by otter experts in Nepal as Eurasian otter (Shrestha, P., *pers. comm.).*

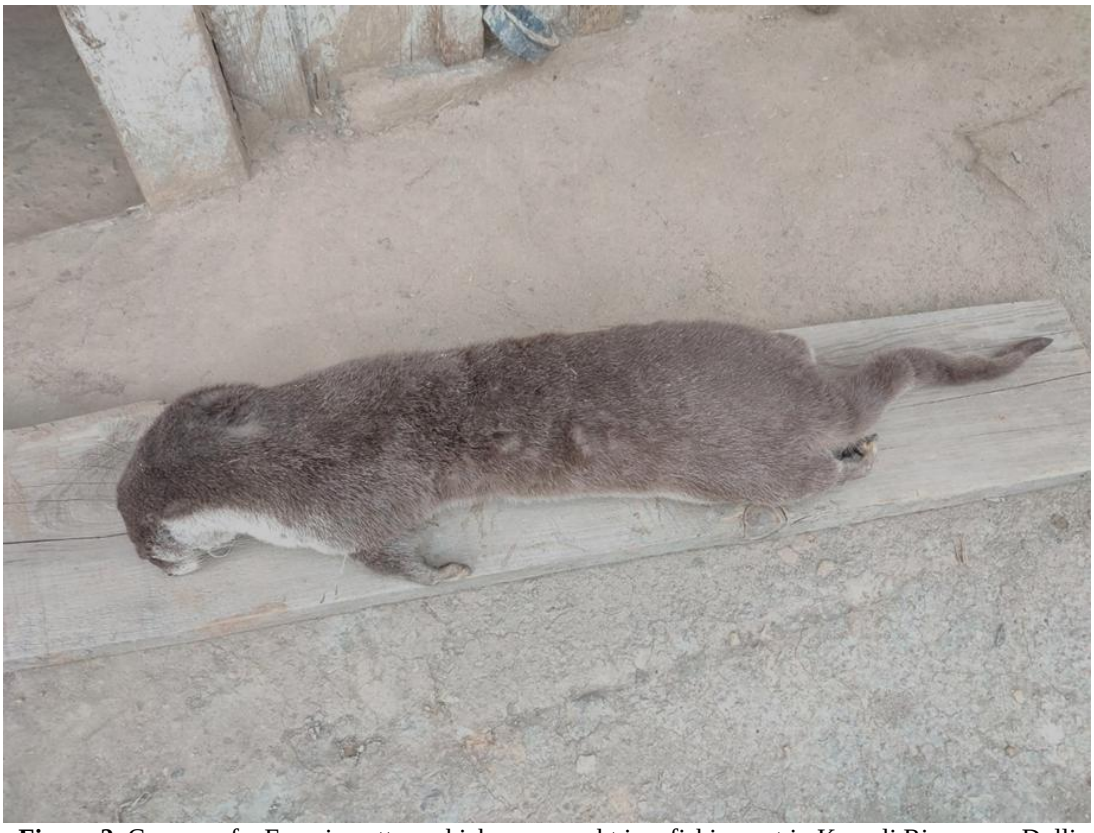

Figure 2. Carcass of a Eurasian otter, which was caught in a fishing net in Karnali River near Dulli Kuna, Humla. (Photo: Vidyaman Thapa)

The otter was captured in a fishing net on the banks of the Karnali River at Dulli Kuna (Fig. 1). Locals from Dulli village were unaware of such a mammal occurring in

the region; however, respondents from other villages in the Sarkegad Rural Municipality did hear about occurrence of otters in the Karnali river and its tributaries in Humla district: Gothi Khola, Ghatte Khola, and Ripgadh Khola. Occasional sightings of otters were also reported further north of the current confirmed location, along the bank of Karnali River at the Narla section (R. P. Lama, *pers comm.*, 2023).

Our workshop results indicate that more than 80% of respondents acknowledge the widespread occurrence of fishing in this region (Fig. 3). We observed local lodges and restaurants as the major participants in these fishing activities, primarily driven by economic incentives. Additionally, people living near the rivers and streams also engaged in subsistence fishing. We identified two distinct fishing practices that locals are adopting in the region. The first method is a traditional approach where villagers would visit streams, and manipulate the water flow by blocking it on one side and diverting it to the other, essentially creating a temporary dry path, and then catching fish in the exposed areas. The second method involves nylon netting, which is widely adopted in the Karnali river. The impact of net fishing practices is problematic as they leave overnight and, in many cases, for an extended period, increasing the chances of catching other species such as otters.

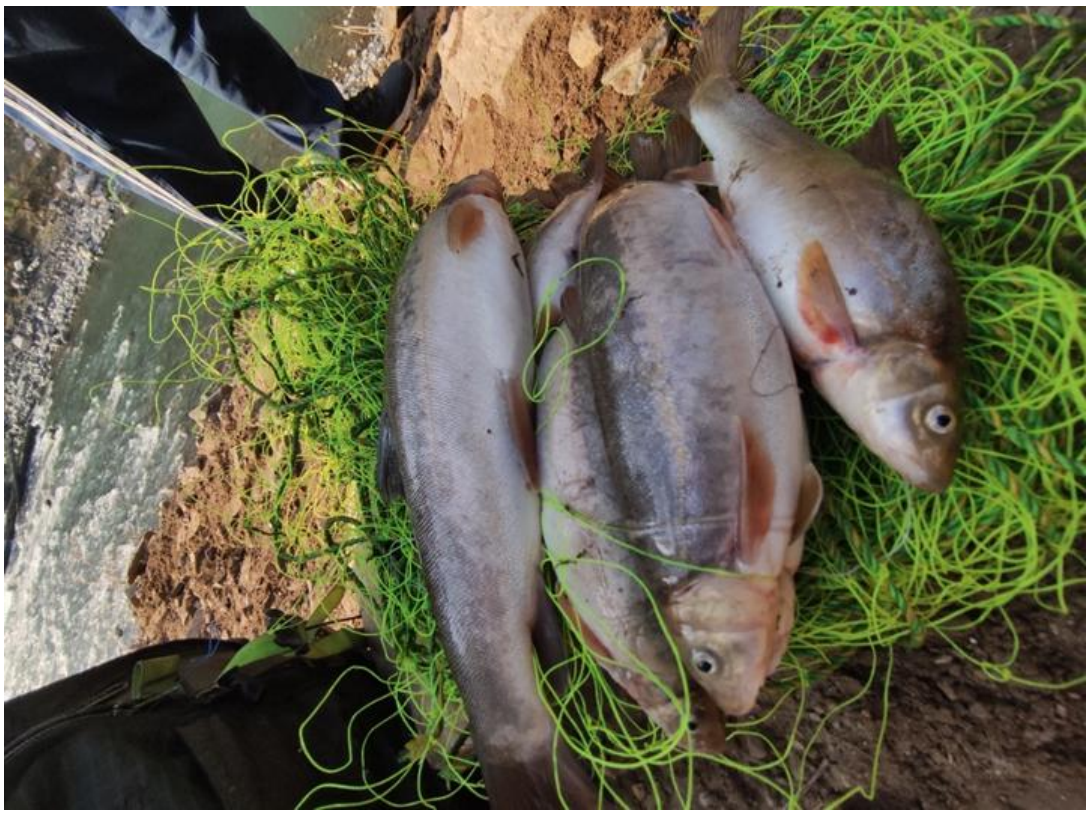

Figure 3. Fish caught in a traditional nylon fishing net by local fishermen in Sarkegad Rural Municipality, Humla. (Photo: Vidyaman Thapa)

In our conversations with 20 local fishermen from Sarkegad Rural Municipality, they reported that fishing success had decreased by 50% compared to the past five years. Traditionally, fishing in the Sarkegad region primarily occurs between February and May. However, in recent times, lodge and restaurant owners are involved in fishing activities throughout the year. This increased dependency on fish for both subsistence and income, could potentially disrupt the aquatic ecosystem and pose a significant threat to both fish and otter populations in this unique freshwater habitat.

CONCLUSIONS

The confirmed presence of Eurasian otters in the Karnali River in the Humla district is a significant addition to their current distribution range in Nepal. This rare confirmation presents an opportunity to formulate local conservation strategies in collaboration with Rural Municipalities for otters, fishes and their delicate habitats. To ensure the long-term persistence of otters in the Humla district, it is crucial to improve local knowledge about otter conservation and promote responsible fishing practices, including fishing gear regulations. To further enhance conservation efforts, it is important to identify and address research gaps related to local otter population status, distribution and human activities directly threatening otter conservation.

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RÉSUMÉ: LES CAPTURES ACCIDENTELLES DE LA PÊCHE ARTISANALE CONFIRMENT LA RÉPARTITION LA PLUS NORDIQUE DES LOUTRES EURASIENNES (*LUTRA LUTRA*) AU NÉPAL

Au Népal, les informations sur la répartition et l'état de la population des loutres Eurasiennes sont limitées, ce qui entrave la planification efficace de la conservation. Nous avons organisé des ateliers de groupes de discussion dans huit grandes agglomérations de la municipalité rurale de Sarkegad, dans le district de Humla, en avril 2023, afin de documenter la présence et la répartition des espèces de mammifères dans la région. Dans l'un des ateliers organisés au village de Dulli, un participant a partagé des informations concernant une loutre piégée par un filet de pêche dans la section de Dulli Kuna de la rivière Karnali. Il s'agissait de la première donnée confirmée d'une loutre Eurasienne dans le district de Humla qui couvre une aire de répartition la plus septentrionale de l'espèce au Népal. Les captures accidentelles de loutre lors de la pêche soulignent la nécessité d'une éducation, d'une sensibilisation à la conservation au niveau communautaire et d'une réglementation des pratiques de pêche, qui restent une menace majeure pour l'espèce dans la région.

RESUMEN: LA CAPTURA INCIDENTAL POR PARTE DE LA PESCA ARTESANAL CONFIRMA LA DISTRIBUCIÓN MÁS SEPTENTRIONAL DE LA NUTRIA EURASIÁTICA (*Lutra lutra*) EN NEPAL

En Nepal hay información limitada sobre la distribución y estatus poblacional de las nutrias Eurasiáticas, lo que dificulta la planificación efectiva de su conservación. Organizamos talleres con "focus groups" en ocho asentamientos importantes en la Municipalidad Rural de Sarkegad, Distrito de Humla, durante Abril de 2023, para documentar la presencia y distribución de especies de mamíferos en la región. En uno

de los talleres conducido en el poblado de Dulli, un participante compartió información sobre una nutria atrapada en una red de pesca en la sección Dulli Kuna del Río Karnali. Esto marcó el primer registro confirmado de nutria Eurasiática en el distrito de Humla, representando la distribución más septentrional de esta especie en Nepal. La captura incidental de nutria en redes de pesca destaca la necesidad de educación y concientización en conservación a nivel de la comunidad, así como de regulación de las prácticas de pesca, que sigue siendo una amenaza de importancia para la especie en la región.