

NOTE FROM THE EDITOR

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Dear Friends, Colleagues and Otter Enthusiasts!

Issue 39/4 is hereby opened. This in fact does not mean that we wait for manuscripts to come for this issue as it is filled, and we are already having manuscripts finished for the first issue 40/1 of 2023.

I understood that many of us joined the 15th IUCN/SSC OSG International Otter Congress (<https://www.otterspecialistgroup.org/osg-newsite/15th-ioc/>) in person or online. There is no better thing than meeting in person as people told me that were there.

I will prepare in the next days a short guideline on how we want manuscripts for the new category “Sightings” should look like. Overall, we will accept any information on otters in areas where they have not been confirmed or not confirmed for a very long time. As indicated in my last editorial the length should not exceed 2 pages and contain mainly geographical information on the aquatic system and evidence for the presence of the otter species in question in the form of photos, DNA proof or similar. There is no need to explain in long the general biology of the respective otter species or aspects of threats etc. The manuscripts will be reviewed for consistency preferably by the species coordinator and one local senior authority.

We are happy that we received again enough manuscripts to fill four issues in one year. Looking back, I can also say that we observe an increasing quality. However, more high-quality manuscripts result in a significant and serious increase in the workload for Lesley. Therefore, my sincere thanks to Lesley for all your efforts on behalf of all of us! It is a real pleasure to work with you.

A handwritten signature in black ink, appearing to be the name 'Lesley'.

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.

Citation: Mishra, R., Lamichhane, B.R., Gautam, B., Ram, A.K., and Subedi, N. (2022). Photographic Evidence of Smooth-Coated Otter *Lutrogale perspicillata* in Koshi Tappu Wildlife Reserve, Nepal. *IUCN Otter Spec. Group Bull.* 39 (4): 189 - 195

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.

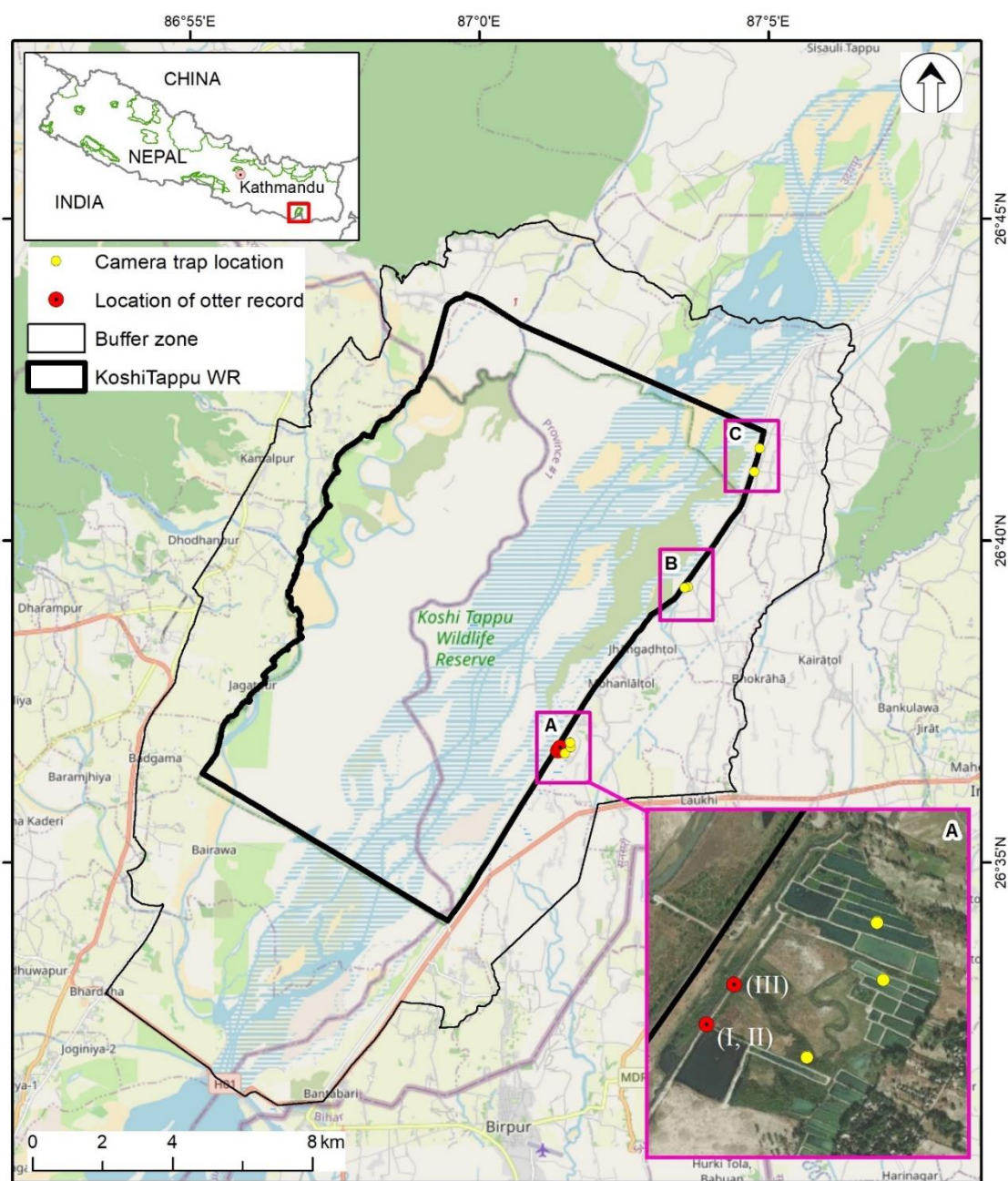


Figure 1. Study area showing camera trap stations and recorded location of otters. A, B, C in the map represent three different sites where camera traps were installed and I, II & III represents the otter capture event as per the details provided in Table 1.

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 तस्विर 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।

SHORT COMMUNICATION

SMOOTH-COATED OTTER DISTRIBUTION AND REPORT ON ILLEGAL OTTER TRAFFICKING IN VALSAD, INDIA

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Abstract: In India, three species of otter are found, but only the Smooth-coated otter *Lutrogale perspicillata* has been reported in Gujarat. Current distribution of this species is limited to Surat, Bharuch, Narmada, and Vadodara District. Hereby, we present distribution of smooth-coated otter in Valsad District. Direct sighting, and indirect sign surveys were the methods used for this study. This might be the southernmost distribution of this species in Gujarat. We also report seizure of sub-adult female otter from illegal trafficking in Valsad. There is a need for further extensive research on the status, distribution, and habitat-use pattern of otters in South Gujarat.

Keywords: Smooth-coated otter, distribution, conflict, Otter trafficking, Otter trade, Gujarat.

INTRODUCTION

Otters are a suitable indicator species for a healthy riverine ecology since they are aquatic predators at the top of the food chain (Kruuk, 1995). They're known to live in a semi-aquatic environment. India is home of three species of otters, Smooth-coated otter (*Lutrogale perspicillata*), Small clawed otter (*Aonyx cinereus*), and Eurasian otters (*Lutra lutra*) (Reuther, 1999). Smooth-coated otter is widely distributed across Southeast Asia. Recent studies stated current distribution of Smooth-coated otter in Bharuch, Vadodara, Narmada, and Surat District of Gujarat (Suthar et al., 2017; Trivedi and Joshi, 2018; Nagrecha and Suthar, 2019). Rivers such as Narmada, Tapi, Purna, and Mahi, among others, have been proven to be lifelines for otters in Gujarat. Otter population is facing threats because of degradation, riparian habitat loss, poaching, and disturbance by human activities, and their feeding behaviour brings those direct conflicts with fisherman who saw otter competitor for fishing (Raj, 1941).

TRAFFIC, in collaboration with the IUCN-SSC-OSG, analysed otter seizures throughout Asia between 1980 and 2015 to better understand the scope of the illegal trade and the species affected. That study, hereinafter referred to as the “otter seizure analysis”, found that tropical Asian otters were involved in illegal trafficking, with 161

otter seizures reported across 15 nations, involving an estimated 5881 people (Gomez et al., 2016). The Smooth-coated Otter is particularly popular among poachers for its pelt and meat (Gomez et al., 2016). Poaching for pelt and meat worsens the adverse effects that these threats have on wild populations. As a result, they are surviving in fragmented population in some isolated areas. In India, Smooth-coated otters are protected under schedule II of the Wild Life (Protection) Act, 1972. It has been assessed as “Vulnerable” by IUCN Red List of Threatened species and listed in Appendix I of CITES (de Silva et al., 2015). Current study provides information on distribution of otter in Valsad District on the basis of sign survey and direct sightings. We also report seizure of otter from illegal trade. The entire study was conducted between June 2020 and March 2022. During this study we also identified potential threats to otter populations.

STUDY AREA

Valsad district is located on the shore of the Arabian Sea (Fig. 1). It has a tropical savanna climate with little to no rainfall from October to May and very heavy to extremely heavy rainfall from June to September when it is under the direct influence of the Arabian Sea branch of the South-west monsoon. The average elevation of the town is 13 meters (43 feet) above the sea level.

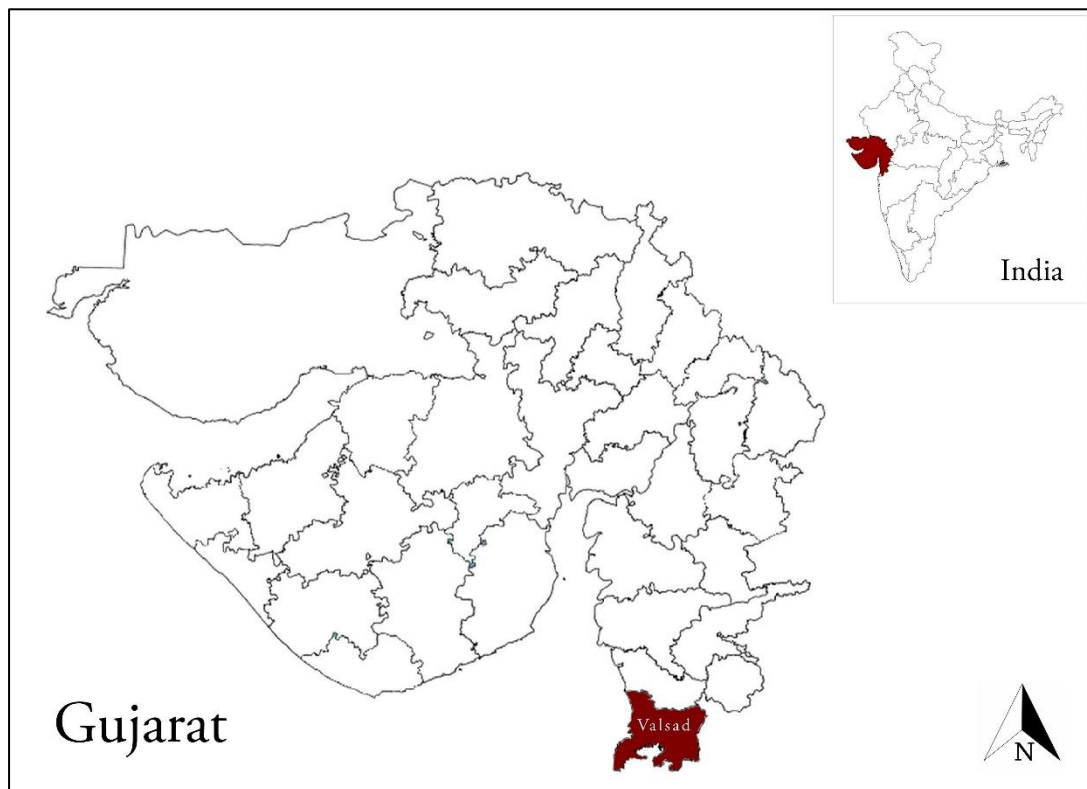


Figure 1. Valsad district in the map of Gujarat.

OBSERVATIONS

On 2nd June 2020, Valsad Forest Department confiscated a sub adult female smooth-coated otter (Fig. 2) from animal trafficking racket from Nanapondha village of Valsad District and arrested five accused during the raid. An official case was filed against the accused by Valsad Forest Department under various sections of Wildlife Protection Act 1972. As per the information, the otter was caught from Doldha river, near Amadha Village and kept at house of one of the accused. It was believed that

accused tried to sell the otter on domestic level within Gujarat for pelt and meat trade or for superstitious activity. No actual reason for the trafficking was confirmed during the investigation. Later on, the otter was released under supervision of forest officials in its suitable habitat. On further investigation, we found tracks and signs of more otters in Amadha village. On 18th April 2022, all the accused got convicted with three years imprisonment and ten thousand rupee penalty.



Figure 2. Smooth-coated otter confiscated from Nanapondha village, Valsad

In addition to this, we report otters from four other sites in Valsad District (Table 1). The presence of otters was confirmed by direct sighting (Fig. 3) and indirect evidence such as tracks and spraints at the sites (Fig. 4). This is the first photographic record of smooth-coated otter from Valsad District. This may be the southernmost current distribution of this species in Gujarat.

Table 1. Distribution of Smooth-coated otter in Valsad District

| Sr. No. | Site Name | GPS Coordinates | Remarks |
|---------|---------------|--------------------------------|---|
| 1 | Nanaondha | 20°24'21.46"N 73° 7'39.54"E | Sub-adult female otter confiscated in a raid by Valsad Forest Department. |
| 2 | Shankar Talav | 20.672797°N 72.961362°E | Observed by locals and indirect signs found. |
| 3 | Shankar Talav | 20.673732°N 72.929650°E | Observed by locals and indirect signs found. |
| 4 | Gundlav | 20.621571°N 72.963579°E | Photographed and indirect signs found. |
| 5 | Kundi | 20.671046°N 72.969512°E | Photographed and indirect signs found. |
| 6 | Amadha | 20°25'21.14"N 73° 9'50.26"E | Sighted by locals in Doldha river and indirect signs found. |



Figure 3. Otter sighted in Kundi Village, Valsad



Figure 4. Smooth-coated otter spraint from Shankar Talav, Valsad

In Gundlav village, we observed a pair of otters in a lake. We found an active den in the nearby area where the otter grooming signs and spraints were found. The sighting was occasional but continued for more than three months at the same village. We also found a pair of otter in Kundi village (Fig. 3). During the observation, we found them hunting in the water body and grooming on the sand bank in the nearby area. No den was reported from this village, but the area has dense vegetation and there is a possibility that the otter uses this dense vegetation as a shelter.

During the study, various threats to otters were observed, including poaching, fish poisoning, intensive fishing, habitat damage, etc. These threats can be a serious concern for otter population in this fragmented area. There is a serious need of further extensive

research on the status, distribution, potential threats, and habitat-use pattern of otters in South Gujarat.

To ensure the species' long-term survival in South Gujarat, habitat protection, reducing threats, raising public awareness, and incorporating the local population in otter conservation is essential.

Acknowledgments - We would like to express our gratitude to Abhijeetsinh Rathod Range Forest officer of Nanapondha, Kaprada Range, Mr Raj Bhavsar of GSPCA and Wildlife SOS, and Valsad Forest Department for providing necessary information about the confiscated otter from Nana Pondha. We would like to thank Mr. Snehal Patel, Mr. Ashish Vakil from Nature Club Surat, Mr. Puneet Nayyar (IFS) from Gujarat Forest Department, and Nature Club Surat for their continuous support.

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RESUME

DISTRIBUTION DE LA LOUTRE À PELAGE LISSE ET RAPPORT SUR LE TRAFIC ILLÉGAL DE LOUTRE À VALSAD, EN INDE

En Inde, on trouve trois espèces de loutres, mais seule la loutre à pelage lisse *Lutrogale perspicillata* a été signalée au Gujarat. La distribution actuelle de cette espèce est limitée à Surat, Bharuch, Narmada et au district de Vadodara. Dans cet article, nous présentons la répartition de la loutre à pelage lisse dans le district de Valsad. L'observation directe et les relevés d'indices de présence constituent les méthodes utilisées dans le cadre de cette étude. Ce pourrait être la distribution la plus méridionale de cette espèce au Gujarat. Nous signalons également la saisie de loutres femelles subadultes issues du trafic illégal à Valsad. Il est indispensable de poursuivre des recherches approfondies sur le statut, la distribution et le modèle d'utilisation de l'habitat des loutres dans le sud du Gujarat.

RESUMEN

DISTRIBUCIÓN DE LA NUTRIA LISA, E INFORME SOBRE EL TRÁFICO ILEGAL DE NUTRIAS EN VALSA, INDIA

En India se encuentran tres especies de nutria, pero en Gujarat se ha reportado solamente la nutria lisa *Lutrogale perspicillata*. La distribución actual de la especie se limita a los distritos de Surat, Bharuch, Narmada, y Vadodara. Aquí, presentamos la distribución de la nutria lisa en el Distrito de Valsad. Los métodos utilizados para éste

estudio fueron el avistaje directo, y relevamientos indirectos de signos. Ésta podría ser la distribución más austral de ésta especie en Gujarat. También informamos el decomiso de una nutria hembra sub-adulta, del tráfico ilegal en Valsad. Es necesaria una extensiva investigación sobre el status, distribución y patrón de uso de hábitat de las nutrias en Gujarat del Sur.

ARTICLE

ASSESSING HUMAN DIMENSION IN CONSERVATION OF SMOOTH-COATED OTTERS (*Lutrogale perspicillata*) IN NUANAI RIVER, PURI, ODISHA, INDIA

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Abstract: Mammals that use inland and coastal waters interact with people regularly, as they share similar habitats and resources. The Smooth-Coated Otter is an apex predator in the aquatic ecosystem that frequently interacts with local communities. When Cyclone FANI hit Balukhand Wildlife Sanctuary, which is close to the Eco-sensitive Nuanai area, in May 2019, this was one of the victim species witnessing a catastrophic population loss in Puri, Odisha. This is Odisha's first community-based conservation project. We conducted a semi-structured interview to examine people's perceptions and attitudes regarding the species, as well as to document the population's dangers. There was a huge threat to the species, but people are more aware now as a result of our research, and there are fewer threats.

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Keywords: Smooth-Coated Otters, perception analysis of local community, community awareness, threats to species.

INTRODUCTION

Otters form a distinct group in the Mustelidae family of mammals and are placed in the Lutrinae subfamily (Sivasothi, 1995). Smooth-coated otters are the largest of Asia's otters (*Lutrogale perspicillata*), and are semi-aquatic (Nowak, 1991). Smooth-coated otter is known to be one of the least studied species (Hussain and Chaudhry, 1997). Its flattened tail and hairless nose sets it apart from the Eurasian Otter. Identification of this species can be done by a crooked diamond-shaped nose, long body, short muzzle, small eyes, low ears, flattened tail, social (usually found in groups), domed head. The otter's forelimbs are shorter than the hind limbs; webbed limbs are present allowing it to swim. Small carnivores (Mammalia: Carnivora, bodyweight < 15 kg) make up about 70% of the 286 species of carnivores perceived right now in the Balukhand Wildlife Sanctuary (Wozencraft, 2005). Occupying the apex position in the trophic level, with a prominent population in this area, Smooth-Coated Otters are one of the first species to disappear when the environment is modified or polluted (Foster-Turley et al., 1990; Parera, 1996).

Puri, Odisha has a long history of natural disasters, mainly due to the large number of cyclonic depressions that form each year in the Bay of Bengal. This sub-basin is very active and produced one of the deadliest tornadoes of all time. Tropical cyclones form during the months of March to June and October to December with a peak in May and November. This has become a common scenario where the natural habitat of many animals, the wilderness, is destroyed. This devastation results in the decline of species populations due to habitat loss.

The Smooth-Coated Otter was a victim species facing a severe population decline in Puri in May 2019, when Cyclone FANI struck Balukhand Wildlife Sanctuary, which is near to the Eco-sensitive Nuanai area. Cyclone FANI forced Smooth-Coated Otters to shift their ranges and move towards soft shade or buffer areas closer to human habitats, which subsequently led to otter-human conflict. This study helps in understanding the situation and accounting the main stressors on Smooth-Coated Otters post FANI; this can be further monitored closely to minimize problems of conflict, and design an appropriate restoration plan for the area, taking into account the species' needs and the concerns of local people. Wildlife management is not limited to the conservation of certain species of flora and fauna: it is about managing an entire ecosystem (de Wulf et al., 1988). When planning conservation actions, the complex ways in which humans affect wildlife and habitat adaptation through direct and indirect actions must be taken into account (Ditchkoff et al., 2006).

Human dimensions in Species Conservation

Human perceptions towards carnivores differ with a number of variables including: gender (Campbell and Alvarado, 2011), age (Morzillo et al., 2010; Campbell and Alvarado, 2011), species (Lescureux and Linnell, 2010; Campbell and Alvarado, 2011), knowledge/education (Morzillo et al., 2010; Lescureux et al., 2011), location (Dar et al., 2009; Liu et al., 2011), occupation (Hazzah et al., 2009; Lescureux and Linnell, 2010), frequency of contact (Hazzah et al., 2009; Lescureux and Linnell, 2010; Lescureux et al., 2011; Liu et al., 2011), and religious/belief systems (Hazzah et al., 2009; Liu et al., 2011). This lability in perceptions means that through actions such as environmental education, it is possible to modify human perceptions, which can directly influence human behaviors with positive outcomes such as reducing human wildlife conflicts and promoting the conservation of biodiversity (Dickman, 2010), but see Liu et al., 2011. The increase and expansion of human populations means that biodiversity and species conservation activities are intrinsically associated with the

socio-economic context (Marshall et al., 2007; Dickman, 2010). The resolution of human-wildlife conflicts (Dickman, 2010), the success of re-introduction (Morzillo et al., 2010), and the effectiveness of protected areas (Andam et al., 2008) are all dependent on the local context, which includes the perceptions of stakeholders.

Community based conservation is often given meaning at odds with the cultural perspectives of the ‘communities’ that are expected to practice it. The term covers a broad spectrum of management and benefit-sharing arrangements for the involvement in natural resource management of people who are not agents of the state but, by virtue of their location and activities, are critically placed to enhance or degrade the present and future status of natural resources. In its study of community approaches to wildlife management IIED (1994) points out that the concept can be approached in spatial, sociocultural, and economic terms. Economically they can be considered as ‘groupings of people who share interests and control over particular resources’. For rural peoples, for whom the presence of wildlife has important economic implications, wildlife valuations tend to be more instrumental, even where their cultures assign an intrinsic value to wildlife.

Perceptions may range from positive when otters can act as tourist attractions capable of generating revenue, neutral in agricultural landscapes where they have no impact on local economies (Norris and Michalski, 2009), to negative where Otters are perceived as competitors by fisherman (Gómez & Jorgenson, 1999; Recharte et al., 2008), there is often a considerable disparity between the real and perceived impacts of otters (such as net damage and stock consumption) (Gómez and Jorgenson, 1999; Freitas et al., 2007; Recharte et al., 2008; Rosas-Ribeiro et al., 2011; Vaclavikova et al., 2011).

The deficiency of baseline data on its distribution and ecology is another major constraint that hampers the protection of the species in India (Nawab and Gautam, 2008). Once commonly found throughout its distribution range, the smooth-coated otter started disappearing from a number of its known distribution locations.

STUDY AREA

This study was carried out between May 2020 and February 2021 along the entire ecosensitive zone of Balukhand Wildlife Sanctuary and one of its major tributary the river Nuanai catchment, along the villages which form the part of the study area (Fig 1). This area lies between 20 m and 100 m above sea level.

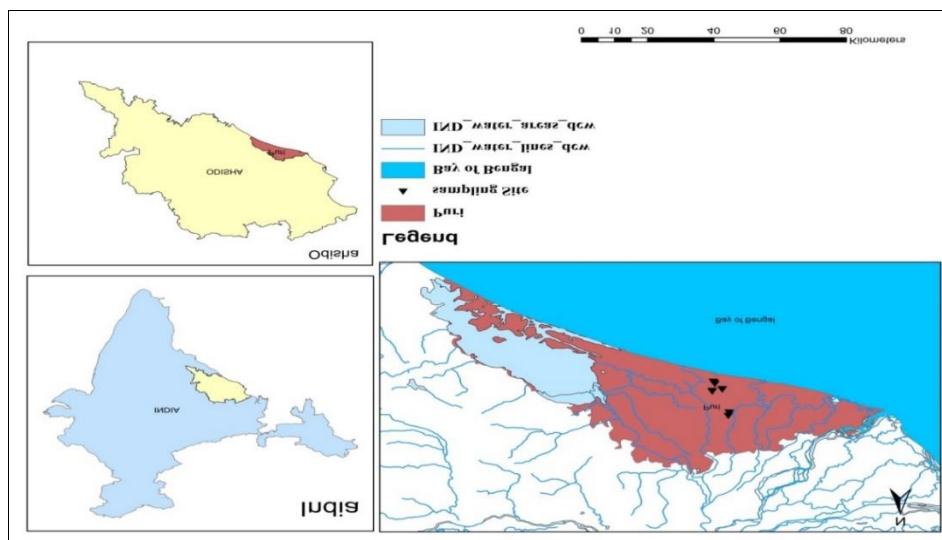


Figure 1. Location of the study area in India

River Nuanai is one of the major rivers of Odisha, located near the Balukhand - Konark wildlife sanctuary. It flows through the district of Puri. This manmade sanctuary is home to numbers of wild flora and fauna. Just like any other river here, the Nuanai is both revered, and highly modified for human use. The river flows through plantations, forest and paddy fields, and also through highly cultivated areas, since agricultural fields flank both sides of the river. Keeping otter-human conflicts and density of riparian cover in mind, we chose four places as our project sites: Chainntana, Beladala, Ura and Antarakul villages in Gop.

These areas are highly modified human landscapes and are infamous for poaching and human-animal conflicts. As most of the population depend upon this river, otter-human conflict is very likely here. Competition for fish is the major issue as the Smooth-Coated Otter looks for easy sources of prey, and in turn damage nets and gets into conflict with fishermen. Intensive fishing, sand mining and numerous dams for irrigation causes habitat fragmentation and increase anthropogenic pressure. As both side of the river flank agricultural fields, this water body is prone to both accidental and intentional pesticide contamination.

Village 1. Chhaintana: (GPS coordinates: Lat – 19.880112, Lon – 85.924844)

There is a good amount of riparian cover on the banks, and holts can be seen easily here. There are mainly two types of community here: fishermen and farmers. The landform change here was unusual enough choose as a project sites (Fig 2).



Figure 2: Fishing nets and agricultural fields at Chhaintana

Village 2. Beladala: (GPS coordinates: Lat – 19.852205, Lon – 85.90068)

This is a place where the river Nuanai is quite shallow. Here, one part of the river flanks agricultural fields, plantations, and paddy patches whereas the other side is a residential

village. Most of the people are farmers here and the fishermen community is very small though the farmers occasionally fish here as well. There is no sign of overfishing or contamination at a first glance, but otter-human conflict prevails here too. The whole village consists of several branches of one family, who are really supportive of each other. The salinity of the waterbody at this place varies and that is why we chose to include this place in our list of project sites (Figure 3).



Village 3. Ura: (GPS coordinates: Lat – 19.983282, Lon – 85.93503)

This is the place where this river is at its deepest (Fig 4). The fishing community is very active here as the fish catch is easy. Abandoned holts can be seen here with no signs of recent activity. We wanted certainty regarding the otter population here and that is why we decided to list this place as one of our project sites. Smaller carnivores like jackals and scavengers like hyaena can be seen roaming on the banks of the river.



Figure 4: Deeper part of the river at Ura.

Village 4. Antarakul: (GPS coordinates: Lat – 19.965642, Lon – 85.943455)

A branch river of Nuanai, the Dhanua, flows through this region. There are no agricultural fields here on either side of the riverbank. The community here is mainly fishermen and livestock farmers. The habitat contains both rocky river banks to rest and marshy areas to forage and otters may roam freely because of dense riparian cover. The waterbody here remains fresh throughout the year and that is why we selected this as one of our study sites. The local community is not so welcoming to foreigners. Pesticide contamination is taking place here, along with snaring and poaching of several species.



Figure 5: The Dhanua River

Nuanai eco-sensitive zone

This is a buffer area outside the Balukhand wildlife sanctuary and is highly eco-sensitive; it suffered from huge damage during the cyclonic storm. This area falls between the village and the epicenter where the cyclone hit the landmass.



Figure 6: Nuanai Eco-Sensitive Zone

METHODS

A sampling framework comprising of different villages was initially developed. The first stage, a rapid assessment of the study area, was done in order to obtain overall information from the villages. Families were visited and their dependency on forests, and interests and attitudes towards otter conservation were studied.

The secondary data was obtained from the questionnaire survey, which was divided into two groups. First was the local (farming) community and second the fishermen community.

This survey was done in the form of a semi-structured interview with a set of questions asked to 300 male respondents both of the local community (n=150) and fishermen community (n=150), on average above the age of 30 (as the females did not come out of their homes, and their interactions were restricted), and some questions were only asked of the fishermen community (See Annex).

We tested our hypothesis that the “*People are not aware of otters and its ecological significance*” through Analysis of Variance (ANOVA) (Excel 2016). It is used to test the equality of two or more population (or treatment) means by examining the variances of samples that are taken. ANOVA is based on comparing the variance (or variation) between the data samples to variation within each particular sample. If the between variation is much larger than the within variation, the means of different samples will not be equal. If the between and within variations are approximately the same size, then there is no significant difference between sample means. Since ANOVA is a parametric test, we first analysed the normality of the data.

We performed the Chi-Square test to assess which among the four major factors are responsible for the decline in otter population in the study area. The purpose of the test is to evaluate how likely the observed frequencies would be, assuming the null hypothesis is true. After the study and completion of the project, we conducted a post-perception study and compared the retaliatory killing before and after the study through paired t-test. A paired t-test is used when we are interested in the difference between two variables for the same subject, often the two variables are separated by time as in this case.

The threats were assessed based on direct and indirect evidence collected through sign surveys conducted in the study area between Mar 2020 and Jan 2021. Certain rapport building practices were implemented in communities residing across study area.

The questionnaire was prepared which contained closed-ended questions including queries regarding otters, their behaviors, habitat, morphology, sightings, human-otter conflicts, possible threats, myths, and recommendations of conservation measures to be asked; each question lead to several other multilevel aspects and other questions.

Based on observation and findings during the questionnaire survey, and evaluation of trading records, different educational awareness programs were conducted in public places and gathering places.

Perception study

People perception study is the process of documenting, analyzing, and summarizing local people’s perspectives of a species or of conservation in general. During this study, questions were formed keeping the social and cognitive behavior of a local community in mind. This study is of immense importance during conservation projects, especially projects based at revenue areas where human-animal interaction is a must. Knowing the perception of the local community and fishermen is vital. Since

monitoring otter behavior is very complex and lengthy, any help obtained from the people perception study is very useful and valid.

People were aware of otter presence in some areas. They were able to identify otters from their morphology. We found out how fishermen retaliate after otters have destroyed the fishing nets. Some of the fishing gear commonly used in this area are clutch wires, trap nets, line nets, box nets etc. We also gathered some sighting information, as people saw otters during dawn or dusk. We noted everything, and it helped us to create awareness among local communities more specifically and it also was helpful during otter-human conflict mitigation.

Rapport building

A relationship involving mutual respect and understanding among all parties who possess each other's best interests in mind is known as rapport. Building a trusting relationship between two or more people and creating rapport between them is known as rapport building. During this process, conservationists impart their knowledge to the local communities, encouraging them to carry forward the executed mitigation measures even after the completion of the project. The process includes

- Identifying common grounds that both parties can agree on, making clear intentions, and explaining to people the importance of otter conservation in their locality.
- Understanding and trustworthy body language help garner support from the locals.

Because of rapport building with the local communities, they participated in several conservation measures during this project. Apart from several surveys conducted by our team, we depended upon the information being provided by the locals to trace otters and identify threats towards them. We were also able to locate conflict-prone areas where we were able to assess threats with support received from the locals. Rapport building with the fishermen community helped us during our human-otter conflict mitigation segment under which we compensated suffering fishermen with new fishing nets.

RESULTS

Perception analysis of both Local and fishermen community:

Data was found to be normally distributed. Based on ANOVA ($df = 3$), we accepted the null hypothesis ($P=0.74$) that people from the four villages are aware of the otter and its ecological importance and the sample mean of the four villages population was same and there was no significant difference observed.

A. Awareness and Species Identification

In the perception study of 300 persons from 4 villages, we found that 84% of the people from Beladala had seen otters, compared to 77% of the people from Antrakul, 57% of the people from Ura and only 43% of the people from Chhaintana. (Fig. 7).

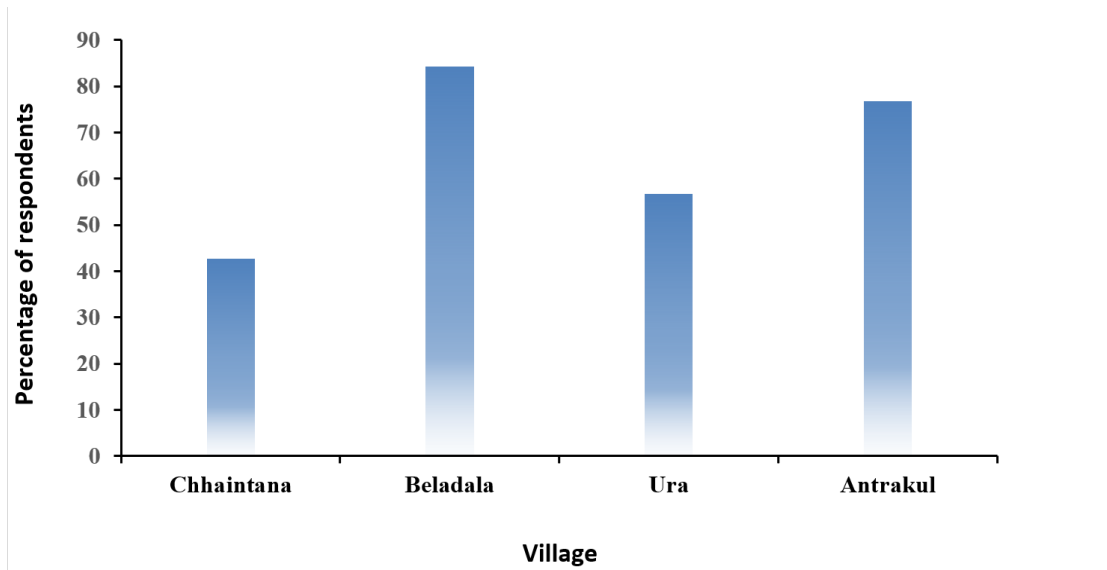


Figure 7. Level of awareness in the four villages

We found that among the 300 men, 71.67% could correctly identified otters, while 13% of them identified otters as civet, 5.34% people identified them as mongoose, and 10% were unaware of otters (Fig. 8.). People were not able to distinguish between the otter species.

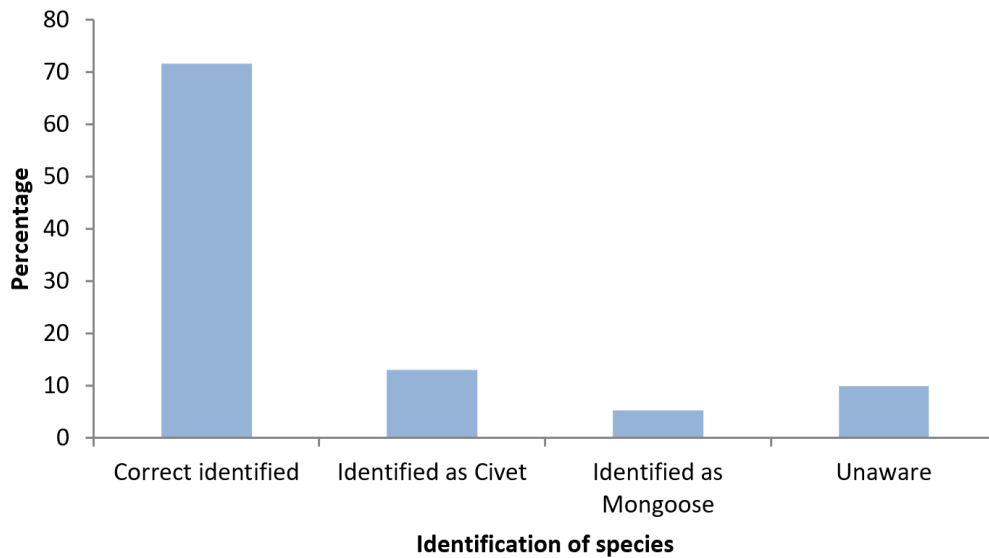


Figure 8. Species Identification and Awareness

B. Population Trend

According to this study, people from Antrakul (47.82%) believed that the otter population is increasing. People from Ura (36%) believed that the otter population is decreasing. Most people from Beladala (45%) and Chhaintana (48.13%) are unaware of the otter population (Fig. 9). It can be seen declining or uncertain depending on the answers given by the people.

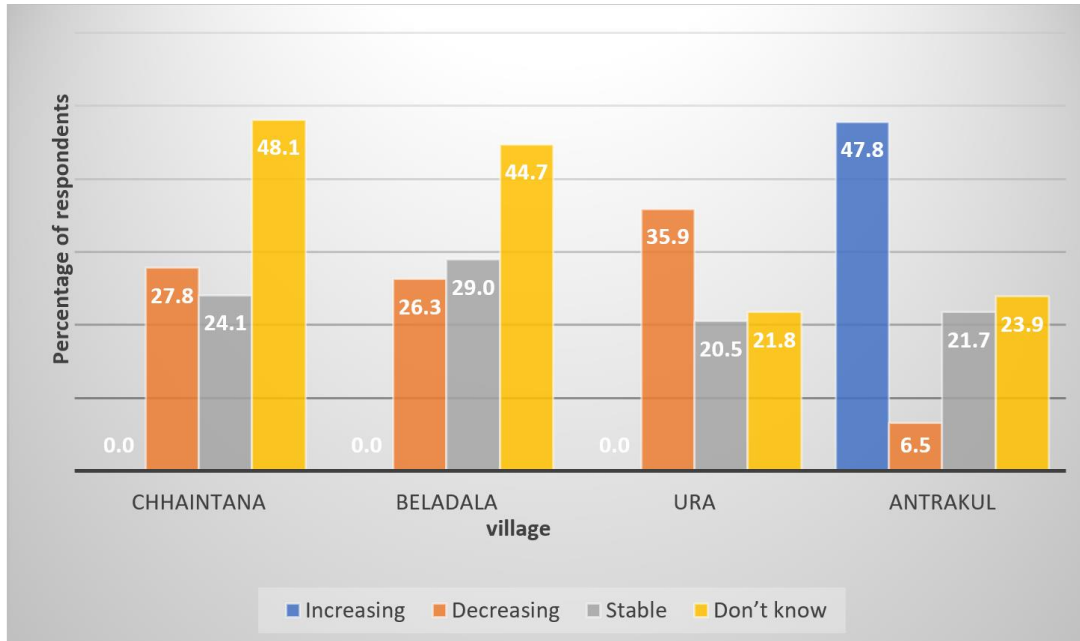


Figure 9. Otter population trends in different areas according to the local people

C. Activity Pattern

According to respondents, in Chhaintana (47.91%) otters were found to be active during evening, while in Beladala (39.8%) the otters were found to be active during morning. The people from Ura (31.75%) and Antrakul (50%) found otters to be active at night (Fig. 10.).

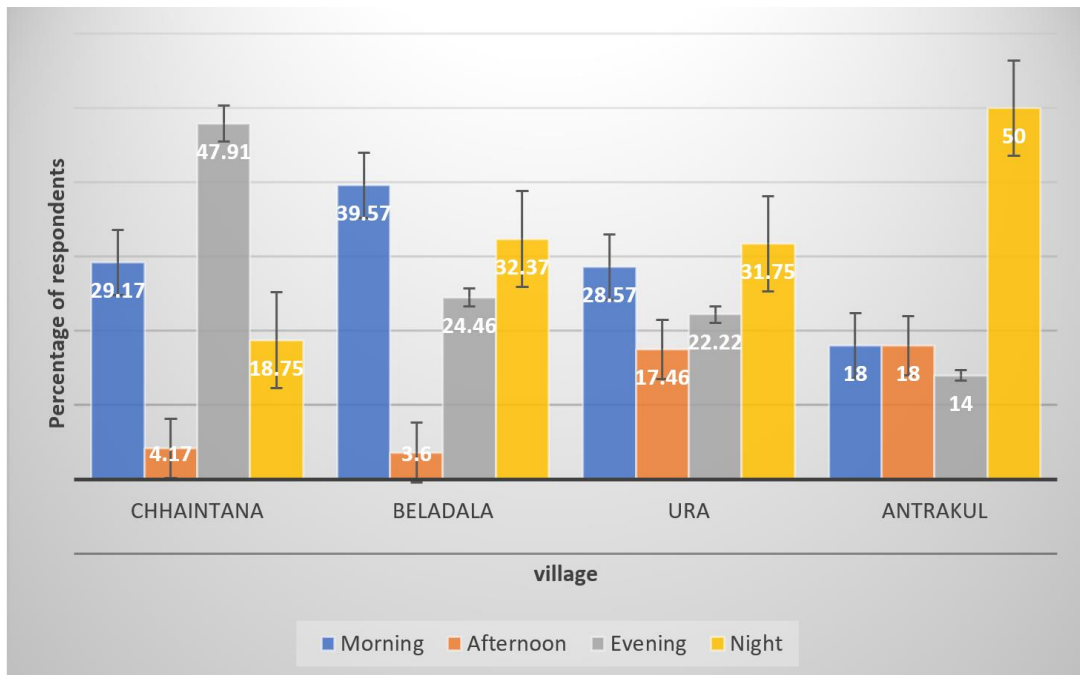


Figure 10. Species Interaction Activity pattern

D. Major Factors for Population Decline and Species Ecological Value

We suggested some major possible threats, and local people had no other opinion or suggestions. Most people from the villages Beladala (66.67%), Ura (75%), and Chhaintana (60.27%) believed the main reason for otter population decline was natural calamity. People from Antrakul considered that natural calamity and contamination

were the reason for otter population decline (Fig. 11). According to this study, overall, retaliatory killing in all the four regions was considered low at 6.67%. The chi-square statistic is 40.7416. The *P*-value is <0.00001 and the result is significant at *P*<0.05.

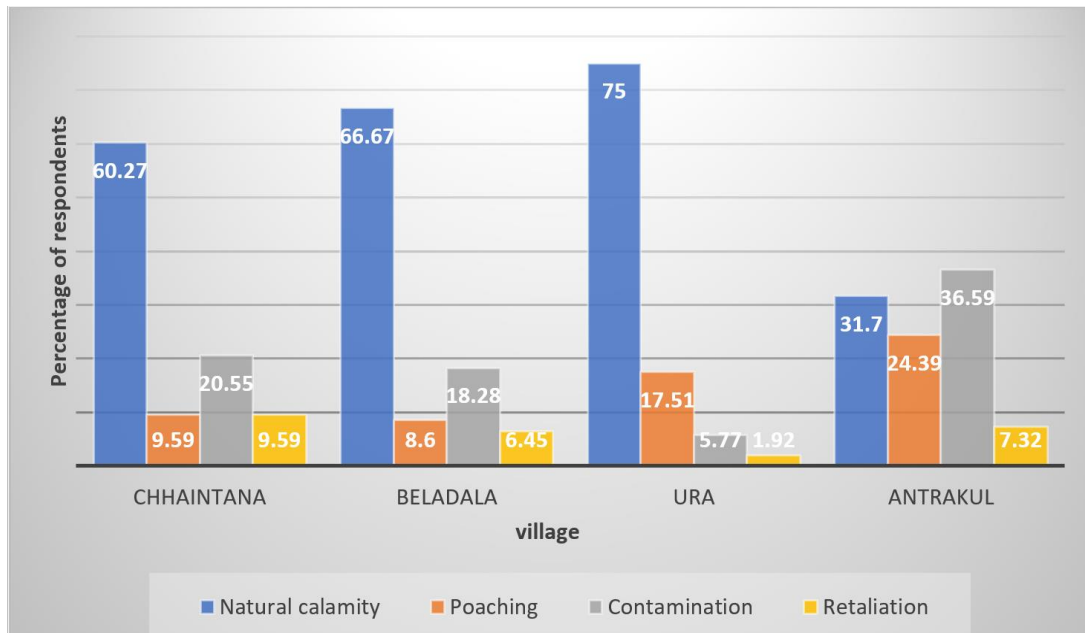


Figure 11. Major threats to the otter

The results from the chi-square test show that each factor: natural calamity, poaching, contamination, and retaliation, contributes to the depletion of otter populations. When we asked that whether the species was important for the natural environment, we found that a majority of the people from Beladala and Chhaintana found otters to be important for the natural environment, in contrast to those from Antrakul and Ura (Fig. 12). We explained this term “Ecological importance” to people in a very simple manner by asking whether they thought this species is important for nature or not?

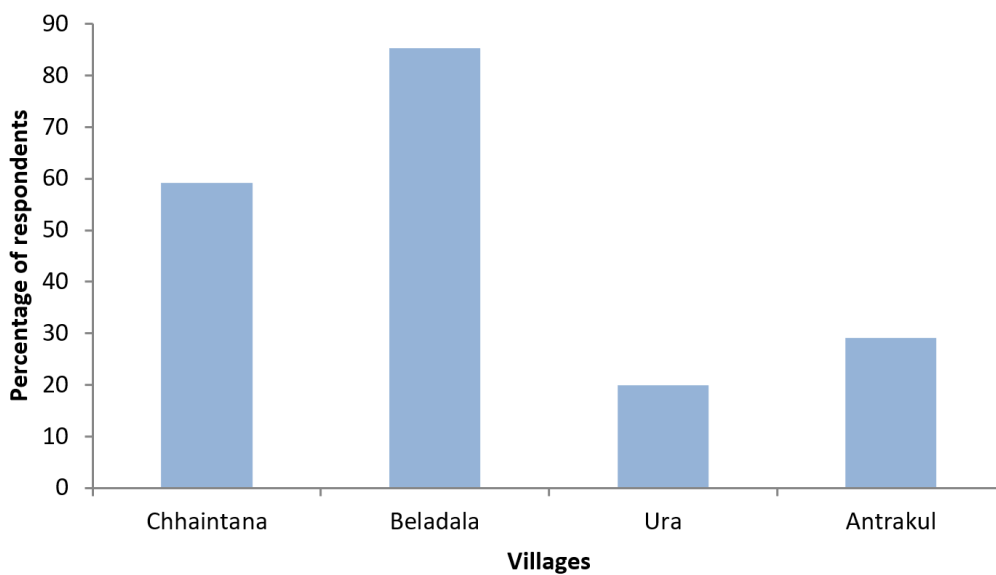


Figure 12. Ecological value of otters in local opinion

Perception Analysis Survey of the Fishing Community Alone: Fish Catch based on Season, Fishing Net Type used and Damage caused by Otters

From the survey of the fishermen community (n=150), most fisherman in all four villages thought that the fish catch is highest during summer (48%-53%) compared to rainy season (26%-46%) and winter (4%-15%) (Fig. 13).

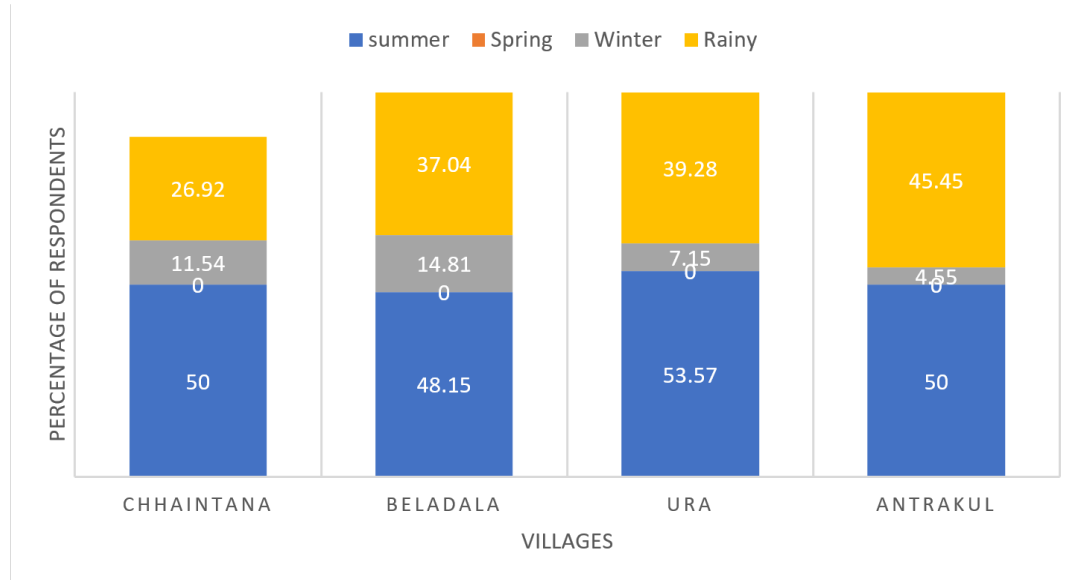


Figure 13. Fish catch rate based on seasons

The survey shows that most fishermen use line nets in all villages, followed by drag nets and box-nets. Line nets were majorly found damaged by otters (Fig. 14). The entangled prey is being taken by the otter and in doing so they tear apart the net sieve.

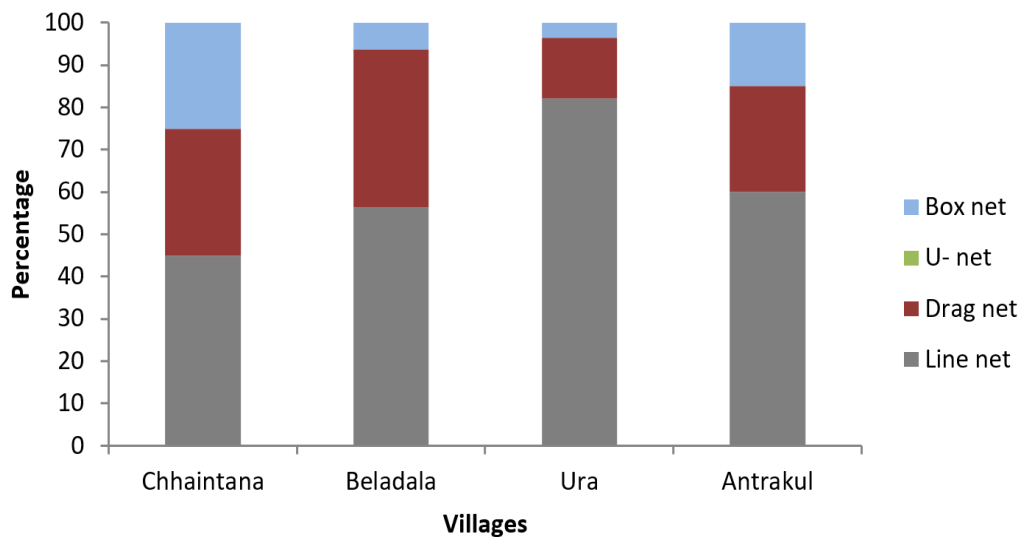


Figure 14. Type of fishing net used by fishermen

According to the survey, a very low percentage of fishermen overall believed that their nets were damaged by the otters. Some people from Chhaintana, Beladala and Ura found their fishing nets damaged by otters (Fig. 15).

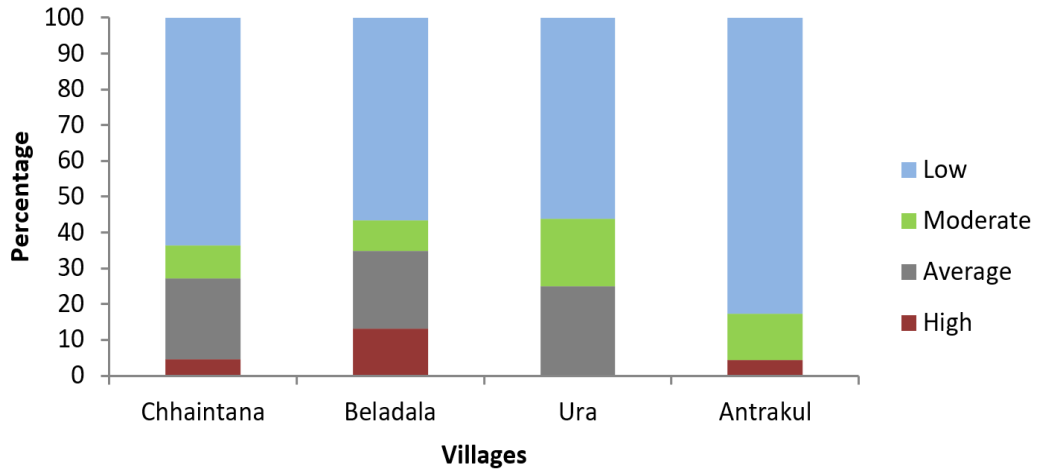


Figure 15. Fishing net damage caused by otters



Figure 16. Conducting the Fishermen perception study

Post-Perception Assessment:

The number of retaliatory killings before and after awareness campaigns were collected, and paired t-test used to check the conflict level: the obtained t-value was observed to be 2.13, and t-value from the table was found to be 1.638 under 0.1 significance level, which ultimately leads to acceptance of the alternate hypothesis that denotes that there is a significant decrease in retaliatory killing after the awareness programme. The data from the post conservation shows that 89% of men now correctly identify otters.

Major Threats to Smooth-Coated Otters in the Study Area

Two otters were trapped accidentally at Chhaintana during 2017. Local people killed them. Otherwise, we found no other records. Otters mostly tore the fishing gear, and their claws were strong enough to release themselves from fishing nets.

Direct threats

- i. **Retaliation:** The management of negative impacts is an important conservation concern as retaliatory killing of wild animals can endanger their populations, and prohibiting retaliation can anger communities sharing space with them (Madden, 2004; Woodroffe et al., 2005). Retaliatory killing by the fishing community occurs when otters destroy fishing nets during foraging.
- ii. **Climate change:** The occurrence of cyclonic storms hitting this portion of land has increased tremendously over the last decade; one such cyclone that occurred was Fani, which made landfall in Balukhand wildlife sanctuary and totally destroyed the ecosensitive zone at the periphery of the sanctuary which was used by otters. Natural calamity and landform change are a major problem here as this district is prone to cyclones, and cyclones cause landform changes destroying holts and foraging grounds. Such cyclonic events are very common here and are a major threat to the species inhabiting this coastal belt.



Figure 17. Cyclonic impact on the habitat post Fani cyclone on species habitat

- iii. **Habitat degradation and fragmentation:** This occurs because of human and agricultural settlements in otter habitat. People install fishing nets and block parts of the river for their convenience, and that causes major changes in the habitat. Habitat is overall degraded and fragmented because of agricultural practices which are the primary occupation of people in this region. The part time occupations of people include fishing, which is more prominent in Ura village, which has a highly disturbed habitat. Here, fishing is done commercially, rather than for subsistence.
- iv. **Lack of public awareness:** Most of the local people are farmers and are poor and illiterate; the women are not allowed to work outside except on their own fields. In this area in Odisha, women are generally not allowed to meet new people or work outside. They have their own traditional and cultural values about this aspect. Socioeconomic status is low, and people are not aware and alert about the importance of habitat condition and biodiversity.
- v. **Poaching:** One of the myths and ancient beliefs here is that there are medicinal properties in otter blood, which is believed to cure epilepsy.
- vi. **Captivity:** Smooth-coated otters in some places are trained for catching fish; while interacting with the people, we got to know that the species is also used for pets.
- vii. **Construction:** Creation of sand and stone embankments in the mouth of the catchment areas to prevent the flow of saline sea water into freshwater acts as a major barrier for the movement of otters in certain areas.

Indirect Threats

- i. Snaring of wild animals is done by using worn clutch wires of two wheelers or GI wire. They are tied around in the areas where the wildlife is frequented, such as water holes, salt lick areas and, especially, around the crop area, which is usually encroached forest land and has interface with the forested area. Poachers identify the animal paths by the presence of footprints, and snares are tied across such paths with twigs spread to close all the adjacent gaps, in order to drive the animal towards the snare. The thin wire, which is camouflaged, is not noticed by the animals as most of them are active at dawn/dusk or during the night. The other end of wire is usually securely tied to nearby tree or log which makes it impossible for the animal to get rid of the snare, and it entangles the animal, mostly by the neck but sometimes also legs, abdomen, etc. As the animal tries to escape, the wire tightens leading to death or resulting in severe injuries. If the animal survives being snared, it will be killed later by the trapper. This is mainly aimed at the crop raiding Spotted Deer (*Axis axis*), but often otters get trapped.
- ii. Shark plastic that is attached to large ships for luring fish was found in this area during field surveys, even though no big ships are known to move on this river. It may be used to attract and trap fishes, but it becomes an indirect threat to the apex predators feeding on these fishes, including otters. Smooth-Coated Otters are not targeted by this snare - the fish are the target – but if snares are present, the whole structure can make it a threat for survival of otters too, as they may be caught in this.
- iii. Box nets are mainly used for catching fish, but often other species, such as snakes, cormorants and, rarely, otters get tangled in them.
- iv. As the river is connected to the sea, the river water tends to be saline during full moons, at high tide; in the remaining 15 days, when the full moon impact has gone, the water salinity decreases significantly. Although otters are adapted well to live

in coastal areas and saline waters, the high salinity at this time creates oxygen deficiency in the water and absence of prey, as with the increased salinity fish tend to move to inland freshwaters, although more crustaceans are found. The increased water salinity and the altered chemical constituents in water body may have an impact on the otters' abundance and preferred locations.

- v. Pesticide pollution is a very common phenomenon in several places. Water bodies are being deliberately (and illegally) contaminated with poison, such as a local pesticide called "Antt", to increase the fish catch; since otters are primary fish-eaters, they consume contaminated fish. The pesticide not only kills all the fish, but also harms the entire eco system, including otters who occasionally die because of this. This has been done for years now and not much has been written about this. We encountered pesticide contamination during one of our field visits. We got to know about it from a local fisherman during our rapport building procedure. We located the place and decided to look into this matter. Water samples from several places were taken and tested. The results were astounding, as we found enough pesticide content in the water to make it hostile for avifauna. There are high levels of pesticide contamination and this has led to bioaccumulation across the food chain. The primary piscivorous species of birds, and wetland birds associated as resident or migratory species, are mainly affected by this bioaccumulation of toxins in the food chain. We documented this result and addressed it during our awareness campaigns at that village and academies.
- vi. People also mix flour with poison to kill various birds like storks etc.

DISCUSSION

Among the four villages, people were most aware about otters in Beladala and least in Chhaintana. Although Beladala and Ura used to be major otter sites, they are now the most degraded and affected habitat. In case of Ura, the majority of the men suggested that the population of smooth coated otters in their area has significantly declined. Similarly, in Chhaintana, people's attitude to the otter population was negative, and they said that the species were more common in the past compared to the present. Natural calamity was considered to be the major threat to the species in all the four villages, followed by poaching, contamination and retaliation. Poaching and contamination were cited most commonly in Antarakul: this is the habitat where the species has presently migrated to, and thus the people need to be made aware and further conservation based activities are needed in this area. Poaching was least commonly mentioned in Beladala. Contamination is also a significant threat to the species in its habitat.

The majority of interactions happen during the early morning and night, which is the time when most of the fishing activities occur.

Often, the major problem is direct conflict between humans and animals, and humans in retaliation often kill the animal. This also tends to demonstrate the perception of the people, whether it is neutral or highly negative as often in case with big cats. Thus, it becomes important to know if people were harmed directly by otters. We found that the otter has never attacked anyone here. However, retaliation was highest in Chhaintana followed by Antarakul.

Fishing activity and the fish catch was highest in Ura and moderate in Beldala followed by Chhaintana and Anatarakul. Ura is a highly disturbed habitat and lvery little evidence of otters has been recorded from this place. The fish catch is average in Antarkul, a habitat quite often used by the otter after the cyclonic impact. Seasonal


variation in fishing activity may have a relationship with otter occurrence and their feeding behavior. In Odisha, people believe that from the beginning of November until December, for one month, fish suffer from “spring disease”. During this period, both selling of fish in the market and fishing by fishermen decline. Fishing activity was highest during summer, and good during the rainy season – conflict with otters was least during these times of heavy catches. Abundance of prey resources tend to minimize the interaction between otters and humans, and thus one may say that the rainy season is the most favorable season for the otter from this aspect. However, this conclusion would be wrong as several other factors need to be investigated.

CONCLUSION

After the study, people are more aware that otters are a major part of the ecosystem, and they are just as important as we humans. They also have the right to survive and are beneficial and helpful for the sustenance of all living forms.

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ANNEX: THE QUESTIONNAIRE




Wildlife Trust of India
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R A P

Rapid Action Project








Community Survey Questionnaire on Indian Smooth Coated Otter (*Lutrogale Perspicillata*)

Name: _____ GPS: _____

Village: _____

1. Have you ever seen any otter? Yes / No (a) 
2. Can you identify an otter? _____ (Tick if correct)
3. When you seen otter last time? Days interval: _____
4. What was the otter doing when you noticed? _____
5. What is the population of otter in your area as per your view?
High / Average / Moderate / Low _____
6. What is the time you get occurrence of otters normally? (b) 
7. When is the time you find otters more active?
Morning / Afternoon / Evening / Night _____

Fishermen Community:

1. How is the fish catch now? (c) 
- High / Average / Moderate / Low _____
2. Any specific species you find favorite of otter? _____
3. Which is the most fishing friendly season?
Summer / Spring / Winter / Rain _____
4. How many times you go inside river to catch fish? A: _____
5. Have you ever caught otter in your net accidentally? What you did next?

6. Did ever otter damage your fishing net? Yes / No _____
7. What are the types of net or ways of fishing adapted? _____
8. What do you think, how otters can be useful? (Myths) _____
9. Where otter mostly prefer to stay during rainy season? _____
10. How's the habitat of otter here? Any threats you noticed on otters? _____
11. Do anyone ever harm by otter? Yes / No _____
12. Do you think otter is helpful? If No. why? _____
13. Changes in Landform or Debris? High / Average / Moderate / Low _____

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RESUME

EVALUATION DE LA DIMENSION HUMAINE DANS LA CONSERVATION DE LA LOUTRE A PELAGE LISSE (*Lutrogale perspicillata*) SUR LA RIVIERE NUANAI, PURI, DANS L'ETAT D'ODISHA, EN INDE

Les mammifères qui utilisent les eaux intérieures et côtières interagissent régulièrement avec les humains, car ils partagent des habitats et des ressources similaires. La loutre à pelage lisse est un prédateur au sommet de l'écosystème aquatique qui interagit fréquemment avec les communautés locales. Lorsque, en mai 2019, le cyclone FANI a frappé le sanctuaire faunique de Balukhand, qui est proche de la zone écosensible de Nuanai, c'était l'une des espèces témoins victimes d'une perte de population catastrophique à Puri, dans l'état d'Odisha. Il s'agit du premier projet de conservation communautaire d'Odisha. Nous avons mené une entrevue en partie dirigée destinée à examiner les perceptions et les attitudes des gens à l'égard de l'espèce, ainsi que documenter les dangers pour la population. Il y avait une énorme menace pour l'espèce, mais les gens en sont davantage conscients maintenant grâce à nos recherches, et il y a moins de menaces.

RESUMEN

EVALUACIÓN DE LA DIMENSIÓN HUMANA EN LA CONSERVACIÓN DE NUTRIAS LISAS (*Lutrogale perspicillata*) EN EL RÍO NUANAI, PURI, ODISHA, INDIA

Los mamíferos que utilizan aguas interiores y costeras interactúan con la gente en forma regular, ya que comparten hábitats y recursos similares. La Nutria Lisa es un predador-tope en el ecosistema acuático, que interactúa frecuentemente con las comunidades locales. Cuando el Ciclón FANI impactó el Santuario de Vida Silvestre Balukhand, que está cerca del área Eco-sensible de Nuanai, en Mayo de 2019, ésta fue una de las especies que fue víctima de una pérdida poblacional catastrófica en Puri, Odisha. Ésta es el primer proyecto de conservación basado en la comunidad, de Odisha. Llevamos a cabo una entrevista semi-estructurada para examinar las percepciones y actitudes de la gente respecto a la especie, así como para documentar los peligros sobre la población. Había una enorme amenaza a la especie, pero la gente está más conciente ahora como resultado de nuestra investigación, y hay menos amenazas.

सारांश

अंतर्देशीय और तटीय जल का उपयोग करने वाले स्तनधारी नियमित रूप से लोगों के आस-पास आ जाते हैं , क्योंकि वे समान आवास और संसाधनों को साझा करते हैं। स्मूथ-कोटेड उदबिलाऊ जलीय पारिस्थितिकी तंत्र में एक शीर्ष शिकारी है जो अक्सर स्थानीय समुदायों के नजदीक निवास करता है। जब चक्रवात फानी ने मार्च 2019 में बालूखंड वन्यजीव अभयारण्य को छुआ था , जो पर्यावरण के प्रति संवेदनशील नुआनाई क्षेत्र के करीब है, तो पूरी , ओडिशा का एक छेत्र, एक विनाशकारी आबादी के नुकसान की शिकार प्रजातियों में से एक थी। यह ओडिशा की पहली समुदाय आधारित संरक्षण परियोजना है। हमने प्रजातियों के बारे में लोगों की धारणाओं और दृष्टिकोणों की जांच करने के साथ-साथ आबादी के खतरों का दस्तावेजीकरण करने के लिए एक अर्ध-संरचित साक्षात्कार आयोजित किया। इस जगह के स्थानीय प्रजातियों के लिए एक बड़ा खतरा था, लेकिन हमारे शोध के परिणामस्वरूप लोग अब अधिक जागरूक हैं, और कम खतरे हैं।

सारांश –

અંતર્દશિય અને તટીય જળ નો ઉપયોગ કરતા સ્તનધારી નિયમિત રૂપે આજુ બાજુ ના લોકો ના સંપર્ક માં આવે છે તેમના રહેઠાણ અને સંસાધનો સમાન હોવાના કારણે. ઉદ બિલાડી જળચર પરિસ્થિતિ નો એક સિર્શ શિકારી છે જે નજીક ના સ્થાનીય સમુદાય ના લોકો ના સંપર્ક માં આવે છે. માર્ચ ૨૦૧૯ માં ઓડિશા ના પૂરી ની નજીક સ્થિત નુનાઈ વિસ્તાર ના બલુખંદ વનજીવ અભ્યારણ માં જ્યારે વાવાઝોડું ફની ત્રાટક્યો ત્યારે આ શિકાર પ્રજાતિ પણ એક વિનાશકારી આબાદી માંથી એક હતી. આ ઓડિશા ની પ્રથમ સમુદાય આધારિત સરક્ષણ પરિયોજના છે. અમે આ પ્રજાતિ ના વિષય માં લોકો ની ધારણા અને દૃષ્ટિકોણ ની માહિતી સાથે સાથે એમની વસ્તી ને નુકશાન પૌચવા ના દસ્તાવેજીકરણ માટે એક અર્થ સંચારિત સાક્ષાત્કાર નો આયોજન પણ કરેલો. અમારી શોધ ના પરિણામસ્વરૂપ લોકો જગૃક થયા અને આ સ્થાનીય પ્રજાતિ ઉપર નો ઝોખમ ઓછો થયો.

ସାରାଂଶ –

ଅନ୍ତର୍ଦେଶીୟ ଏବଂ ତଟୀୟ ଜଳ ସଂଲଗ୍ନ ଜଳଭାଗ ଉପରେ ନିର୍ଭରଶୀଳ ସ୍ଥଳପାୟୀ ପ୍ରାଣୀ ମାନଙ୍କର ନିୟମିତ ଭାବେ ମନୁଷ୍ୟ ମାନଙ୍କ ସହ ଆକସ୍ମିକ ସାମ୍ନାସାମ୍ନା ହୋଇଥାଏ, ଏହାର ଏକ ମୁଖ୍ୟ କାରଣ ଏହା କି - ଉଭୟେ ଉଭୟଙ୍କର ଆବଶ୍ୟକତା ତଥା ବସବାସ ପାଇଁ ଗୋଟିଏ ସ୍ଥାନ ଉପରେ ନିର୍ଭରଶୀଳ । ପାଣି ଓଧ ଜଳଭାଗର ଏକ ଶୀର୍ଷ ଶିକାରୀ ଯିଏ ମୁଖ୍ୟତଃ ମାନବ ସମାଜ ପାଖରେ ନିଜ ଆବଶ୍ୟକତା ମେଣ୍ଟାଇବା ପାଇଁ ବସବାସ କରେ । ୨୦୧୯ ମସିହା ମାର୍ଚ୍ଚ ମାସର "ଫନୀ" ବାତ୍ୟା ଯେତେବେଳେ ବାଲୁଖଣ୍ଡ ଅଭୟାରଣ୍ୟରେ ସ୍ଥଳଭାଗ ଛୁଇଁଥିଲା, ତାହା ନୁଆନଇ ସ୍ଥିତ ବିପଦଶଙ୍କୁଳ ପାଣି ଓଧର ର ବଂଶ କମିଯିବାର ତଥା ବାସସ୍ଥାନ ନଷ୍ଟ ହେବାର ଆଶଙ୍କା ଜୋର୍ କରିଥିଲା । ଏହା ର ସ୍ଥାୟୀ ସମାଧାନ ପାଇଁ ଓଡ଼ିଶାରେ ପ୍ରଥମ ପାଣି ଓଧ ସଂରକ୍ଷଣ ପରିଯୋଜନା ହୋଇଥିବା ବେଳେ, ଏହା ପ୍ରମୁଖ କାର୍ଯ୍ୟ ଭାବେ ସେଠାକାର ସ୍ଥାନୀୟ ଜନସାଧାରଣଙ୍କର ପାଣି ଓଧ ପ୍ରତି ଥିବା ଧାରଣା ତଥା ବିଚାରର କୁ ତଦନ୍ତ ର ଅନ୍ତର୍ଭୁକ୍ତ କରାଯାଇଥିଲା । ଏହାର ଅଭିପ୍ରାୟ, ପାଣି ଓଧ ପ୍ରତି ବିପଦ ତଥା ଏହାର ନିର୍ଭରଶୀଳତା ଜାଣିବାର ଏକ ପ୍ରୟାସ। କିଛି ଲୋକ ପାଣି ଓଧ କୁ ବିପଦ ବୋଲି ଭାବିବାର ଭୁଲ କୁ ଆମେ ଏହି କାର୍ଯ୍ୟ ର ଉପପର୍ଯ୍ୟାୟ କ୍ରମେ, ଉଚ୍ଚ ତଦନ୍ତର ପରିଣାମ ସ୍ୱରୂପ ଭ୍ରମ ଦୂର କରେଇଥିଲୁ, ଯାହା ବର୍ତ୍ତମାନ ସ୍ଥିତି ରେ ପାଣି ଓଧ ସୁରକ୍ଷାରେ ଏକ ଅଭିନ୍ନ କାର୍ଯ୍ୟ ଭାବେ ବିବେଚିତ ।

SHORT COMMUNICATION

A RARE RECORD OF AN ALBINO EURASIAN OTTER *Lutra lutra* IN CENTRAL IRAQ

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Abstract: Colour aberrations such as albinism and leucism are congenital and heritable disorders in the synthesis of melanin pigmentation, and rarely observed in otters' wild populations. In June 2022, a rare albino young Eurasian Otter (*Lutra lutra*) was trapped in the Tigris River in Central Iraq and transported by the Iraqi environmental authorities to be raised in captivity at Baghdad Zoo. Here, we report a first case of albinism of the species in the wild population in Iraq.

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Keywords: Albinism; Baghdad Zoo; colour aberration; distribution range; white otter

INTRODUCTION

The Eurasian Otter (*Lutra lutra*) is the most widespread otter species in Western Europe, across most of the Palearctic, downward to India, Southeast Asia, North Africa, and the Middle East (Duplaix and Savage, 2018; Yoxon and Yoxon, 2019; Roos et al., 2021). Its zoogeographical extent in the Middle East is represented by a patchy distribution of scattered populations that occur in Turkey, Palestine and Israel, Lebanon, Jordan, Syria, Iran, and Iraq (Al-Sheikhly et al., 2020). In Iraq, the Eurasian Otter inhabits almost in all suitable aquatic habitats along the Tigris and Euphrates Rivers (Al-Sheikhly and Nader 2013; Al-Sheikhly et al., 2017). It was reported from several localities in southern Iraq (Cheesman, 1920; Sanborn, 1940; Hatt, 1959; Harrison and Bates, 1991; Abass, 2013), with few observations made in the central and northern parts of the country (Al-Sheikhly and Nader 2013). However, the first photographic records were obtained in southern and northern Iraq by Al-Sheikhly et al. (2017). Moreover, a remarkable range extension of Eurasian Otter distribution in extreme western Iraq was recently made by Al-Sheikhly et al. (2020).

Albinism is a complete lack of melanin pigmentation in an animal's light-sensitive tissues at the posterior portion of the eyes (retina) and other bare parts (fur and skin), and attributed to congenital and heritable aberration in the pigment producing cells (melanocytes) (Dorp, 1987; van Grouw, 2012). Leucism is a partial or total lack of melanin in the skin where the amount of white can vary from just partial leucistic to all-white individuals, which always possess colourless skin as well, except that the eyes always being darkly pigmented (van Grouw, 2013, 2014; Al-Sheikhly et al., 2018).

These morphological anomalies can also be caused by non-hereditary external factors, e.g. low consumption of foods rich with tyrosine responsible for melanin synthesis (van Grouw, 2012). Observations of otters with colour aberration in the wild is extremely scarce; however, “white otters” of different species have been rarely reported worldwide. For examples, a young male albino Neotropical Otter (*Lontra longicaudis*) was recorded in the Camaratuba River in northeastern Brazil (Toledo et al., 2014). A total of three leucistic Neotropical otters were recorded from Mexico (Arriaga-Flores et al. 2016). A hypopigmented young “white otter” was reported among group of wild Oriental Small-clawed Otter (*Aonyx cinereus*) in Sumatra (Allen et al., 2019). However, a young captive-bred albino Oriental Small-clawed Otter, that originated from a breeding facility of white Oriental Small-clawed otters in Indonesia, was sent to Japan for exhibition (MMN 2017). A leucistic Smooth-coated Otter (*Lutrogale perspicillata*) was observed fishing in a watercourse at Huai Kha Khaeng Wildlife Sanctuary in Thailand (Sweetland, 2020).

Colour aberration in the Eurasian Otter is not unknown; atypical “white” Eurasian otters were reported across Northern Europe towards the continental part of the Russian Far East (Goncharuk et al., 2020). Nevertheless, a major review revealed several records of albino Eurasian otters in the British Isles and Europe, based on a 150 years dataset, persisting since 1859 (Green, 2018).

RECENT RECORD

On 15th of June 2022, a young albino Eurasian Otter was trapped by a local fisherman in the major watercourse of the Tigris River at Ishaqi District (34°03'56.3"N 44°01'48.2"E), ~ 20 km to the northwest of Balad Township, south of SalahAdain Province, Central Iraq. The site is situated within the Mesopotamian Shrub Desert (PA01320) Ecoregion. The habitat is comprised mainly of riparian vegetation of *Phragmites australis* beds, *Tamarix* sp. shrubs, *Ziziphus* sp., *Eucalyptus* sp., and *Populus* sp. trees and date palm, citrus, and grape orchids lined both banks of the Tigris River.

The albino otter was named “Tigris” (=Dijla in Arabic) and kept as a pet by the fisherman who published his extraordinary catch on the local hunting groups’ Facebook. An online notification on this unusual discovery was sent to the Iraqi Green Climate Organization (IGCO-a registered environmental NGO), which immediately informed the Iraqi Ministry of Environment (IMoEn) to take urgent action. Later, an IMoEn-IGCO joint mission was conducted to examine the albino otter on 16th of June 2022. An interview with the local fisherman indicated that the young albino otter was coincidentally trapped by a fishing net set on the river watercourse at 06:30 a.m. A close examination of the young (3-4 months) female Eurasian Otter, identified based on Harrison and Bates (1991), showed a rare case of albinism. It had pinkish nose and skin, bright red eyes, pale pinkish feet with complete white claws, and white mystacial vibrissae and fur (Fig. 1). The albino Eurasian Otter was observed swimming among a family group of eight otters, all of which were reported by the fisherman to be of normal fur colour except for one of the adults which was “white” as well. Despite several offers from local wildlife traders to buy this “white otter” in order to be raised as a pet or to be smuggled to neighboring gulf countries (see Al-Sheikhly and Nader 2013), the local fisherman decided to donate it to the Iraqi environmental authorities on 3rd of July 2022.



Figure 1. The young female albino Eurasian Otter (*Lutra Lutra*) “Tigris”. A: frontal view shows pinkish nose, bright red eyes, and white mystacial vibrissae; B: pale pinkish feet with complete white claws and fur feeding on *Mesopotamian Himri* (*Carasobarbus luteus*) offered by the fisherman. Photos © Omar Al-Sheikhly 2022.

The Eurasian Otter is listed as Near Threatened on the IUCN Red List based on population declines and lack of information from many parts of the range, sensitivity of the species to pollution, prey base depletion, and habitat degradation (Roos et al., 2021). In Iraq, the species population is declining and becoming rare mainly due to illegal hunting and trapping, which is banned by the Iraqi Wild Animals Protection Law No. 17, issued on 15th of February 2010 (Al-Sheikhly et al., 2014). Regardless, Eurasian otters are continuously targeted by local poachers for their fur or to be raised as pets (Al-Sheikhly and Nader, 2013), or deliberately persecuted by local fishermen who consider them to be destructive aquatic animals to their nets and aquaculture (Al-Sheikhly et al., 2014; Aidek et al., 2021). Furthermore, strangulation and drowning of otters in fishing drift nets has been recognized as a cause of mortality of Eurasian otters from range countries (Al-Sheikhly et al., 2020).

In our case, releasing the young albino Eurasian Otter back to the wild was a matter of contention. Parsons and Bondrup-Nilsen (1995) suggests that animals with colour aberration are rarely observed in wild populations allegedly due to lower life expectancy. Animals with colour anomalies are highly exposed to predation in the wild (Sazima and Di-Bernardo, 1991), intraspecific conflicts (Holt et al., 1995, Al-Sheikhly et al., 2018), or susceptible to infection of optical, immune, and physiological pathogens (Hain and Leatherwood, 1982; Pérez-Carpinell et al., 1992; Fertl and Rosel, 2002; Garipis and Hoffman, 2003; Manglani et al., 2004; Summers, 2009; Toledo et al., 2014; Goncharuk et al., 2020). Based on what mentioned above, combined with prolonged discussion with international experts (see acknowledgments), the albino Eurasian Otter which had been tamed by the fisherman was advised to be raised in captivity. It is currently being kept in an indoor enclosure at Baghdad Zoo where a close health check was provided (Aljazeera Mubasher, 2022). It is worth mentioning, that this incident report is the first record of albinism in the Eurasian Otter wild population in Iraq and probably in the Middle East, and warrants further *in situ* investigation.

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RESUME

UNE OBSERVATION RARE DE LA LOUTRE EURASIENNE ALBINOS *Lutra lutra* DANS LE CENTRE DE L'IRAK

Les aberrations de couleur telles que l'albinisme et le leucisme sont des troubles congénitaux et héréditaires de la synthèse de la pigmentation mélanique, et rarement observés dans les populations sauvages de loutres. En juin 2022, cas rare, une jeune loutre eurasiennne (*Lutra lutra*) albinos a été piégée dans la rivière Tigre au centre de l'Irak et transportée par les autorités environnementales irakiennes pour être élevée en captivité au zoo de Bagdad. Nous rapportons ici un premier cas d'albinisme de l'espèce dans la population sauvage d'Irak.

RESUMEN

UN RARO REGISTRO DE UNA NUTRIA EURASIÁTICA *Lutra lutra* ALBINA EN IRAQ CENTRAL

Las aberraciones cromáticas como el albinismo y el leucismo son desórdenes congénitos y heredables en la síntesis de la pigmentación con melanina, y se observan raramente en poblaciones silvestres de nutrias. En Junio de 2022, fue capturado en una trampa un raro juvenil albino de Nutria Eurasiática (*Lutra lutra*), en el Río Tigris en Iraq Central, y fue transportado por las autoridades ambientales Iraquíes para ser mantenido en cautiverio en el Zoo de Bagdad. Aquí, reportamos un primer caso de albinismo de la especie en la población silvestre en Iraq.

الخلاصة

الأحرفات اللونية مثل المهاق والبهاق هي اضطرابات خلقية وراثية في تخليق صبغة الميلانين، ونادرًا ما تُلاحظ في المجموع السكانية البرية لقضاعات الماء. في حزيران / يونيو 2022، تم أسر قضاعة أوراسية (*Lutra lutra*) صغيرة ذات لون أمهق نادر في نهر دجلة في وسط العراق وتم نقلها من قبل السلطات البيئية العراقية لتربى في الأسر في حديقة حيوان بغداد. هنا، نُبلغ عن أول حالة إصابة بالمهاق في المجموعة السكانية للنوع في العراق.

SHORT COMMUNICATION

FIRST RECORD OF EURASIAN OTTER (*Lutra lutra*) FROM CHHATTISGARH, CENTRAL INDIA

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Abstract: The Eurasian otter *Lutra lutra* is one of the three species of otters found in Indian rivers. Ten different studies reported its presence with photographic evidences and captured individuals from seven different states in India. These studies reflect the distribution of Eurasian otters from North, Northwestern and Northeastern Himalayas, Eastern coastal India, southern Western Ghats to Satpura-Maikal range of Central India, all located at separate location on the subcontinent. We report the presence of Eurasian otter (*Lutra lutra*) first time with photographic confirmation from Chhattisgarh, 200 km away from the nearest known location in Kanha Tiger Reserve, Madhya Pradesh, and confirms a geographical range extension of the Eurasian otter in Central India. New records suggest that the species may yet be present in other locations across India. The Eurasian otter is in urgent need of intensive study in their distribution range in order to elevate their protection by scientific and management authorities.

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Key words: Eurasian otter, Central India, Chhattisgarh

INTRODUCTION

The Eurasian otter *Lutra lutra* (Linnaeus, 1758) is the most widely distributed species of all 13 otter species in the world, ranging throughout Eurasia. In the Indian subcontinent, Eurasian otter shares its habitat with the Smooth-coated otter (*Lutrogale perspicillata* I. Geoffroy Saint-Hilaire, 1826) and the Small-clawed otter (*Aonyx cinereus* Illiger, 1815). There are very patchy distribution records in India and very few studies exist to describe their status and ecology in the country. Records of Eurasian otter are available in the Himalayas along the north of India, extended from northwest to northeastern parts (Jamwal et al., 2016; Bhattacharya et al., 2019; Khatiwara and Bhutia, 2020; Pal et al., 2021; Borker et al., 2022; Savage, 2022) that included Jammu and Kashmir, Uttarakhand, Sikkim and Arunachal Pradesh, and in south India records are available yet in the southern Western Ghats only (Pocock, 1949; Prater, 1980; Foster-Turley and Santiapillai, 1990; Hussain and Choudhury, 1997). Photographic evidence is available from recent camera trap studies from Central India (Jena et al., 2016; Joshi et al., 2016; Uikey, 2021) Western Ghats, Tamil Nadu (Mudappa et al., 2018), Ladakh (Jamwal et al., 2016), Nyamjang Chu river and Pakke Tiger Reserve, Arunachal Pradesh (Bhattacharya et al., 2019; Borker et al., 2022), Chilika Lake, Odisha (Adhya and Dey, 2020) and from Bhagirathi Basin, Uttarakhand (Pal et al., 2021). The species is categorized as Near Threatened on IUCN Red List (Roos et al.,

2015). European populations are well characterized and are increasing in some countries, but in many parts of their range populations have gone extinct or are declining, or the trend is largely unknown (Chanin, 2003).

In this paper we report the presence of Eurasian otter for the first time in the State of Chhattisgarh from Korba and Kathghora Forest Division, Central India. A survey recorded photographs and indirect signs as scats and tracks during a study from September to November, 2021. The photographs were taken of rescued Eurasian otters obtained from the study area. Otters were found to use forested and non-forested areas of these forest divisions which were often dominated by various anthropogenic activities ranging from the release of effluents in otter habitats from thermal power and mining units to hunting of otter for consumption by local fisherman communities. Our report thus describes presence of Eurasian otters from Korba and Kathghora Forest Division of Chhattisgarh and also areas outside the forest and in a need of protection or regular vigilance to give the species a safe habitat to thrive.

STUDY AREA

Korba Forest Division in Korba District lies between 22° 01'–23° 01' N latitude and 82° 08'–83° 09' E longitude in the State of Chhattisgarh. Four prominent perennial rivers flow through the district, namely, Sonbhadra, Hasdeo, Ahran, and Lilagar. Hasdeo Rivers originating from the Chhotanagpur Plateau in the Surguja District and flowing southwards. The climate of the district is tropical and usually hot and dry, until the southwest monsoon brings rain. The winters span from December to February, followed by summer from March to June. The South-West monsoon lasts from mid-June until September. The district has an average elevation of approximately 305 masl and receives an annual rainfall of 1507 mm. The majority of the region is a plateau of the Maikal Ranges of the Satpura Hills. The main forest types found in this area is moist peninsular Sal forest, moist mixed deciduous forest, dry peninsular Sal forest and northern dry mixed deciduous forest which is also common in adjacent Kathghora Division. The availability of coal in the region has led to the construction of many power plants, which impact otter habitat.

METHODOLOGY

We collected opportunistic evidence of otters from the surveyed grids of a King Cobra survey during the post-monsoon and early winter seasons. The Korba Forest area was divided into forty-five grids, each 25 km² in size, primarily in forest habitats. In each grid a trail of 5 km was sampled, where a four-member team searched for King cobras and other snake species for about five hours per day. Indirect otter sign was observed, and their GPS locations were noted (Fig 1).

At a later date, we came to know about the rescue cases of two otters from Kathghora Division, adjacent to Korba Forest division. One of them was held at Jungle Safari in Raipur and the other was rescued from the water filter plant of National Thermal Power Corporation, Kathghora Division and sent to Kanan Pindari Zoological Park, Bilaspur in Chhattisgarh. The photographs of the otters were obtained (Fig. 2) from the zoological parks and identified based on field guides and research articles (Menon, 2014; Joshi et al., 2016; Mudappa et al., 2016).

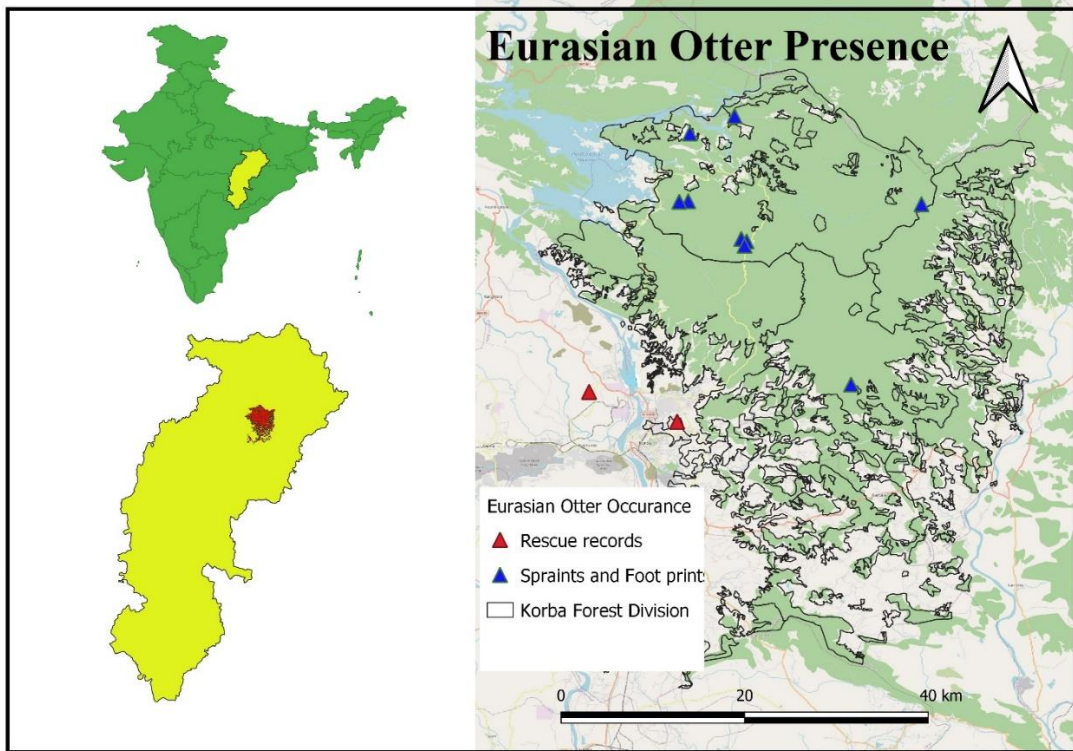


Figure 1. The indirect sign and rescue records of Eurasian otters obtained from Korba and Kathghora Forest Division of Chhattisgarh.



Figure 2. Rocky and sandy riverbanks where indirect signs of otters were observed.

RESULTS

Tracks and scats of Eurasian otter were found in fourteen locations. The indirect records were observed in rivers and streams flowing through sandy and rocky river banks flanked by Sal mixed forest. The two otters held at zoos adjacent to Kathghora Forest Division recorded the Eurasian otter for the first time in the State of Chhattisgarh (Fig 3). Otter signs was found from 383 masl to 561 masl. Species identification was

based on the shape of muzzle, nostril, whiskers, coat, webbed and clawed feet, and conical tail.

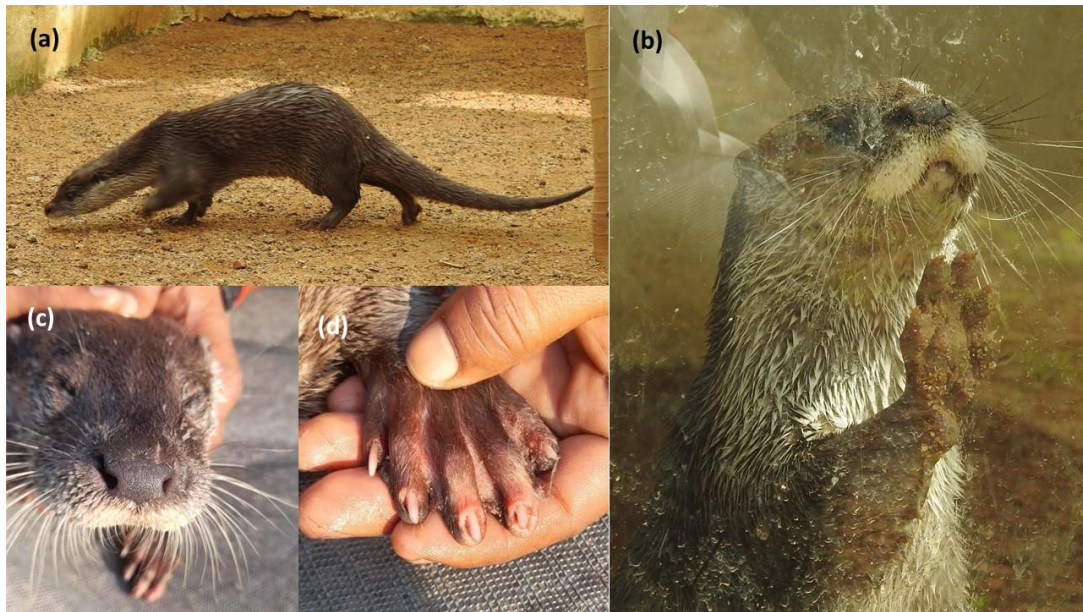


Figure 3. Two rescued individuals of Eurasian otter from Kathghora Forest Division of Chhattisgarh. Image (a) and (b) represent the first rescued individual and (c) represents the second rescued otter. Image (d) shows the extended claws and webbed feet typical of the second Eurasian otter. Image (b) of first individual also shows the pronounced muzzle and extended claws.

DISCUSSION

We record new evidence of the geographical range of the Eurasian otters in the central Indian landscape. Until now nine photographic records of this species have been published for India (Fig 4). Two of these records of Eurasian otter were described from Satpura-Maikal range of Madhya Pradesh in Central India (Joshi et al., 2016; Uikey, 2021). Our records from Chhattisgarh are also situated in an extended part of the Maikal range, 200 km away from the nearest record of this species in Kanha Tiger Reserve, Madhya Pradesh.

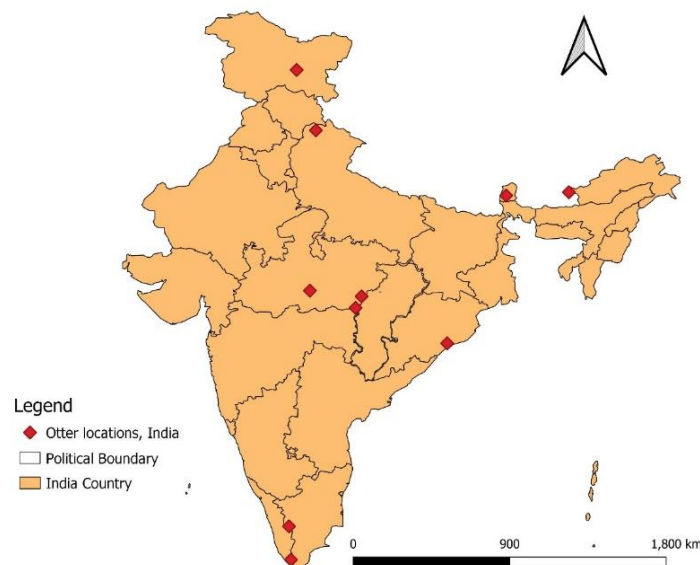


Figure 4. Photographic evidence and capture records of Eurasian otter reported in seven different States and Union Territories of India based on earlier studies.

All the photographic and capture records of Eurasian otters from seven different states in India, are located far from each other. It may be that Eurasian otter populations could be the remnants of a much wider former occupancy (Adhya and Dey, 2020), or that populations have not been detected until recently due to limited vigilance. Rising human populations and their increasing resource demands, may limit the success of otter populations in the future. The fishing and hunting communities in Korba Forest Division, revealed that they often kill and consume Eurasian otters. Otter living outside the forest of Kathghora Division is facing impacts from mining and thermal power units which commonly release effluents into rivers, degrading otter habitat. Eurasian otter populations outside protected areas, thus, remain outside the scope of any protection. Otter populations may have declined in the recent past, and those populations that still persist must be mapped and their conservation threats need to be assessed in order to create baseline data (Adhya and Dey, 2020). Much of the otter habitat in India has been intensively modified or has contaminated waterbodies (Bhattacharya et al., 2019). Intensive distribution studies and long-term monitoring of Eurasian otter prey species ecology, water parameters and threats to riparian habitats are needed in Chhattisgarh and across India.

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RESUME

PREMIER ENREGISTREMENT DE LA LOUTRE EURASIENNE (*Lutra lutra*) DANS LE CHHATTISGARH, AU CENTRE DE L'INDE

La loutre eurasiennne *Lutra lutra* est l'une des trois espèces de loutres que l'on trouve dans les rivières indiennes. Dix études différentes rapportent sa présence avec des preuves photographiques et la capture des individus dans sept États différents en Inde. Ces études reflètent la distribution de la loutre eurasiennne du nord, du nord-ouest et du nord-est de l'Himalaya, de la côte orientale de l'Inde, du sud des Ghâts occidentaux à la chaîne Satpura-Maikal du centre de l'Inde, toutes situées à des endroits distincts du sous-continent. Nous signalons la présence de la loutre eurasiennne (*Lutra lutra*) pour la première fois avec confirmation photographique dans le Chhattisgarh, à 200 km de l'emplacement connu le plus proche dans la Réserve des Tigres de Kanha, Madhya Pradesh, et confirmons une extension géographique de l'aire de répartition de la loutre eurasiennne dans le centre de l'Inde. De nouveaux enregistrements suggèrent que l'espèce

pourrait encore être présente dans d'autres endroits à travers l'Inde. La loutre eurasienne a un besoin urgent d'une étude poussée dans son aire de répartition afin d'augmenter sa protection par les autorités scientifiques et les gestionnaires.

RESUMEN

PRIMER REGISTRO DE LA NUTRIA EURASIÁTICA (*Lutra lutra*) EN CHHATTISGARH, INDIA CENTRAL

La Nutria Eurasiática *Lutra lutra* es una de las tres especies de nutria que se encuentran en los ríos de la India. Diez estudios diferentes han reportado su presencia, con evidencias fotográficas e individuos capturados, en siete estados de la India. Éstos estudios reflejan la distribución de las Nutrias Eurasiáticas en los Himalayas del Norte, Noroeste y Noreste, costa Oriental de la India, Ghats sud-occidentales y el cordón Satpura-Maikal de India Central, todas localidades separadas en éste subcontinente. Informamos aquí de la presencia de nutria Eurasiática (*Lutra lutra*) por primera vez, con confirmación fotográfica, en Chhattisgarh, a 200 km de la localidad más cercana conocida en la Reserva de Tigres Kanha, Madhya Pradesh, lo que confirma una extensión del rango geográfico de la nutria Eurasiática en India Central. La existencia de nuevos registros sugiere que la especie puede aún estar presente en otras localidades a lo largo y ancho de la India. Hay una necesidad urgente de estudios intensivos sobre la distribución de la nutria Eurasiática, para elevar su protección por parte de las autoridades científicas y de gestión.

SIGHTING

FIRST PHOTOGRAPHIC RECORD OF SMOOTH - COATED OTTERS (*Lutrogale perspicillata*) FROM SAURASHTRA, GUJARAT, INDIA

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Abstract: Of the three species of otters found in India, the Smooth-coated otter is the only otter species found in the state of Gujarat. The authors photographed a Smooth-coated otter during field surveys by our team near the city of Bhavnagar in Saurashtra, a peninsular region of Gujarat on the western coast of India. After an extensive search of the area, the team also found tracks of a Smooth-coated otter. This photographic evidence is the first report of Smooth-coated otters in the Saurashtra region of Gujarat.

Citation: Pathak, R., Samal, A., Vegad, P., Zapadiya, V., Mohbatkhan-Bloch, F., and Monpariya, B. (2022). First Photographic Record of Smooth - Coated Otters (*Lutrogale perspicillata*) from Saurashtra, Gujarat, India. *IUCN Otter Spec. Group Bull.* **39** (4): 236 - 240

Keywords Smooth-coated otter, Bhavnagar, Saurashtra, Gujarat, India.

The Smooth-coated otter is widely distributed across South and Southeast Asia, including Pakistan, India, Nepal, Bhutan, Bangladesh, Southwest China, Myanmar, Thailand, Vietnam, Malaysia, Sumatra, Java and Borneo (Mason and Macdonald, 1986; Corbet and Hill, 1992). The Smooth-coated otter typically inhabits lakes, large rivers, dams, irrigation canals, swamps, shallow rice fields and coastal mangroves (Menon, 2003). Here we report the first photographic evidence of Smooth-coated otters from Saurashtra, Gujarat, India.

At 1300 hrs on 15th October 2022, during field work by the team near the city of Bhavnagar, in the Saurashtra region of Gujarat, while travelling near a temple close to

a waterbody with a GPS coordinate of 22.0416033, 71.9727351 (Fig. 1), the team observed a short hairy mongoose shaped animal resting near agriculture land. A Nikon P1000 camera was used to capture images of the animal. It was later identified as a Smooth-coated otter (Fig. 2) by the corresponding author. The species had never before been reported at Saurashtra (Suthar, 2017).

After the identification of the species, the team surveyed the area for a week with different methods including a sign survey. From a questionnaire among locals regarding the species, the team learned that there is only one kind of otter they have noticed. We found tracks (Fig. 3) at two locations through a sign survey and believe that the tracks were from one individual otter.

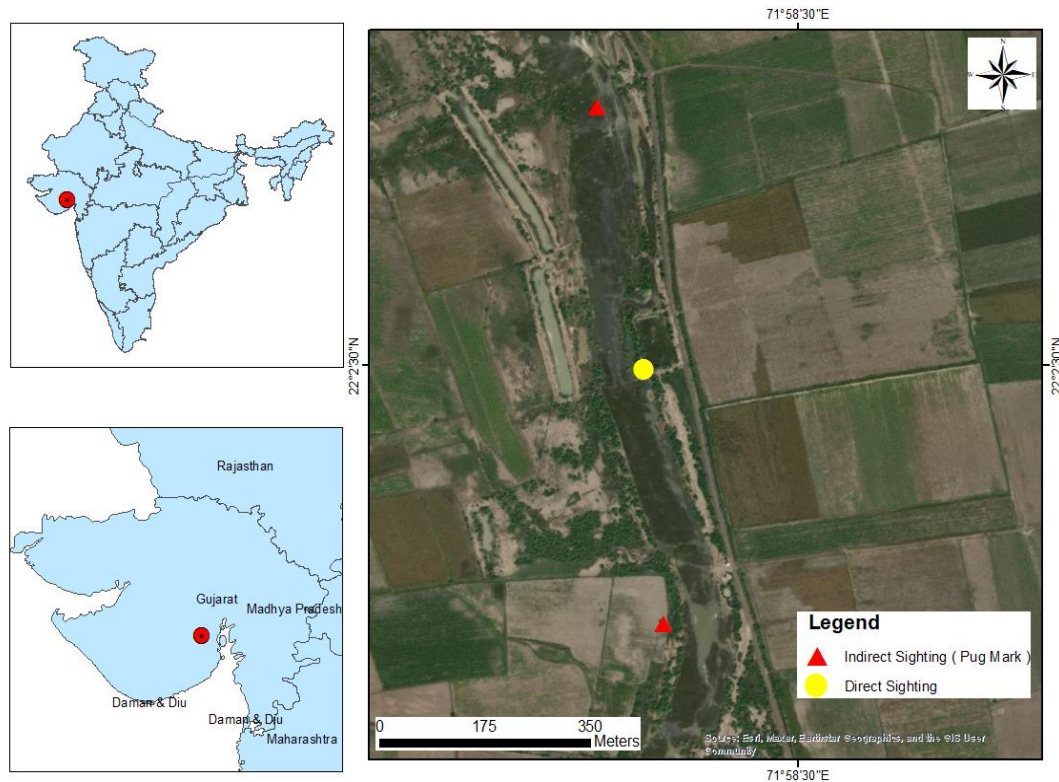


Figure 1. Map of the location where the Smooth-coated otter at Saurashtra, Gujarat was observed.



Figure 2 a & b. Smooth-coated otter photographed at Bhavnagar, Saurashtra.



Figure 3. Smooth-coated otter track in the vicinity of the observed otter.

This photographic evidence documents the presence of Smooth-coated otters in the Saurashtra region of Gujarat, implying a new local distribution of Smooth-coated otters in Gujarat. Further studies on the species will be carried out with the support of the Forest Department, along with work to protect the species by conducting a threat assessment.

Acknowledgements - We are thankful to RFO Mr. Dilip Gadhvi and Forester Harpal Singh Chudasma of Velavadar National Park for their logistic support. We also thank Abhi Vyas, Jigar Patel for extended support during field work. We thank Earth Crusaders Organisation for helpful comments on the manuscript.

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RESUMÉ

PREMIERS ENREGISTREMENTS PHOTOGRAPHIQUES DE LOUTRES À PELAGE LISSE (*Lutrogale perspicillata*) DU SAURASHTRA, AU GUJARAT EN INDE

Parmi les trois espèces de loutres observées en Inde, la loutre à pelage lisse est la seule espèce de loutre trouvée dans l'état du Gujarat. Les auteurs ont photographié une loutre

à pelage lisse, lors d'enquêtes de terrain menées par notre équipe, près de la ville de Bhavnagar à Saurashtra, une région péninsulaire du Gujarat située sur la côte ouest de l'Inde. Suite une recherche approfondie dans la région, l'équipe a également trouvé des traces d'une loutre à pelage lisse. Ce document photographique est la première observation de loutres à pelage lisse dans la région de Saurashtra au Gujarat.

RESUMEN

PRIMER REGISTRO FOTOGRÁFICO DE NUTRIAS LISAS (*Lutrogale perpicillata*) DE SAURASHTRA, GUJARAT, INDIA

De las tres especies de nutria que se encuentran en India, la Nutria Lisa es la única especie que se encuentra en Gujarat. Los autores fotografiaron una Nutria Lisa durante relevamientos de campo en Bhavnagar, Saurashtra, en el estado occidental de Gujarat. Después de una búsqueda en áreas cercanas, también fueron observadas huellas de la Nutria Lisa. Esta es la primera evidencia fotográfica de Nutrias Lisas en la región de Saurashtra en Gujarat, India.

સારાંશ –

સૌરાષ્ટ્ર, ગુજરાત, ભારતથી સ્મૂથ - કોટેડ ઓટર (લુટ્રા પર્પિસીલાટા)નો પ્રથમ ફોટોગ્રાફિક રેકોર્ડ

ભારતમાં જળ માંજર / જલ બિલાડી (ઓટર) ની ત્રણ પ્રજાતિઓ જોવા મળે છે, જળ માંજર / જલ બિલાડી (સ્મૂથ કોટેડ ઓટર) એ એકમાત્ર જલ બિલાડી ની પ્રજાતિ છે જે ગુજરાતમાં જોવા મળે છે. ગુજરાતના ભાવનગર (સૌરાષ્ટ્ર) ખાતે અમારી ટીમ દ્વારા ક્ષેત્ર સર્વેક્ષણ દરમિયાન, લેખકોએ એક જળ માંજર / જલ બિલાડી (સ્મૂથ કોટેડ ઓટર)નો ફોટોગ્રાફ લીધો હતો. વ્યાપક ક્ષેત્રીય કાર્યો અને સંભવિત વિસ્તારોની શોધ કર્યા પછી, ટીમને જળ માંજર / જલ બિલાડી (સ્મૂથ કોટેડ ઓટર) ના પગમાર્ક મળ્યા. આ ફોટોગ્રાફિક પુરાવા ગુજરાતના સૌરાષ્ટ્ર પ્રદેશમાં જળ માંજર / જલ બિલાડી (સ્મૂથ કોટેડ ઓટર)ની હાજરીનો પ્રથમ અહેવાલ છે.

ସାରାଂଶ –

ସୌରାଷ୍ଟ୍ର ଗୁଜୁରାଟ ରେ ଦେଖାଯାଇଥିବା ପ୍ରଥମ ପାଣି ଓଧର ସ୍ଥିରଚିତ୍ର ର ବିବରଣ

ଭାରତରେ ସମୁଦାୟ ଭାବେ ତିନି ପ୍ରକାରର ପାଣି ଓଧ ଦେଖିବାକୁ ମିଳନ୍ତି । ମାତ୍ର ଭାରତ ର ଗୁଜୁରାଟ ପ୍ରଦେଶ ରେ କେବଳ ନରମ ଲୋମ ମୃଦୁ ପାଣି ଓଧ ପ୍ରଜାତି ଦେଖିବାକୁ ମିଳିଥାଏ । ଆମର ବନ୍ୟଜନ୍ତୁ ସୁରକ୍ଷା ଦଳ, ସୌରାଷ୍ଟ୍ର ସ୍ଥିତ ଭାବନଗର ର ଏକ ସ୍ଥାନକୁ ଅତିକ୍ରମ କରିବା ସମୟରେ, ଆମ ଦଳ ମଧ୍ୟରୁ କିଛି ବ୍ୟକ୍ତି ଏକ ପାଣି ଓଧର ସ୍ଥିରଚିତ୍ର ଉତ୍ତୋଳନ କରିଥିଲେ । କିଛି ଦିନ ଉକ୍ତ ସ୍ଥାନରେ ନିୟମିତ ତଦାରଖ କରିବା ପରେ, ଆମକୁ ପାଣି ଓଧର ଖୋଜ ଚିହ୍ନ ମିଳିଥିଲା । ଉକ୍ତ ଅଭିଲେଖ ରୁ ଆମେ ପାଣି ଓଧର ନୂତନ ଅବସ୍ଥିତି ବିଷୟରେ ଉପନୀତ ହୋଇଥିଲୁ । ଉକ୍ତ ସ୍ଥିରଚିତ୍ର ତଥା ମିଳିଥିବା ଅନ୍ୟାନ୍ୟ ପ୍ରମାଣ, ପାଣି ଓଧର ସୌରାଷ୍ଟ୍ରରେ ନୂତନ ଅବସ୍ଥିତିକୁ ଦର୍ଶାଉଛି ।

SHORT COMMUNICATION

FIRST REPORT OF DIRECT HUMAN – SMOOTH COATED OTTER (*Lutrogale perspicillata*) CONFLICT AT ODISHA, INDIA

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Abstract: Human – otter direct conflict is rarely reported and do not often reach the news. Otters are carnivores and both an aquatic and a terrestrial mammal. Most of their conflicts with humans are because they take fish from fishing gear, and damage the nets of fishermen, which is their only livelihood. This paper reports the first direct conflict of otters with humans, causing injury to three people from one family in the state of Odisha, India. This report also indirectly shows feral dog – wildlife conflicts.

Citation: Samal, A., Sahu, J.S., Kar, N.B., Pattnaik, B., Mohapatra, M., and Pitchai, R.(2022). First Report of Direct Human – Smooth Coated Otter (*Lutrogale perspicillata*) Conflict at Odisha, India. *IUCN Otter Spec. Group Bull.* **39** (4): 241 - 245

Keyword – Smooth-coated otter, Attack, Feral dog, Conflict, Injury, Treatment, Odisha.

INTRODUCTION

Three species of otters inhabit India (Menon, 2014) and all three have been reported from Odisha (Debata and Palei, 2020) but the Smooth coated otter is distributed mostly in the region of Puri, district of Odisha (Samal, 2022). There are many instances reported where smooth coated otters interact with fishermen affects

the fishermen's livelihood, and later leads to conflict. (Samal, 2022). Up till now, there have been no records of direct conflict between humans and otters in the state of Odisha.

At about 0900 on 12th June 2022, a 9-year-old girl found an otter being chased by a dog near Balabhadrapur, Astaranga, Puri (19.9416000, 86.2885950); the otter took refuge in an abandoned house to save its life from the dog. Curious, the girl entered the house to see the animal; it was stressed and felt threatened by the sudden encounter with the child, and bit her on her left leg calf muscle (Fig 1). The abandoned house was next door to the victim's house.



Figure 1. Canine tooth mark of smooth coated otter on calf muscle of 9-year-old girl.

When the girl shouted in pain, her 32-year-old mother came to the rescue, and tried to help her daughter escape, but, the otter attacked the mother too, biting her hand (Fig 2).



Figure 2. Mother's hand showing fresh bite and after healing.

While escaping in terror from the abandoned house, the otter attacked the youngest daughter (7-year-old) of the family with its claws on her upper thighs (Fig 3). Later the otter escaped from the place using a waterbody on opposite of the house.



Figure 3. 7-year-old victim, who was scratched by the otter, while the otter was escaping.

Three members of one family were attacked and the injuries were severe. The family was taken to the Community Health Center, Astaranga for post bite treatment, where they were given Tetanus and Rabies Vaccinations.

A couple of months later, our team visited the victim family to reassure them, follow up on their injuries, and mitigate the chance of probable retaliation towards the smooth-coated otter species (Fig 4).



Figure 4. Follow up with the victim's family after interval of 2 months to reassure them, and try to mitigate any future human – wildlife conflicts

DISCUSSION

Direct human – otter conflict causing harm is seldom reported in India because the bites are never serious enough to kill anyone. Otters are carnivores and the attacks we mentioned was accidental and unfortunate. We think that the otter was stressed after being chased by dog, felt cornered, and took the human as one of the threats blocking its escape. The attack was unintentional by the otter and due to stress. Follow ups were taken to check the victims' health condition and to avoid probable future conflicts with otters.

Acknowledgement – We are very thankful to PCCF Odisha and RCCF, Bhubaneswar for their encouragement. We thank DFO, Puri for permitting us to work, and providing us all the logistic support in the field during our work. We are thankful to Forest Ranger Officer, Astaranga and the guards of Sahana PRF for helping us in field work and facilities. We thank the people of the community for showing interest in our work and cooperating during our field visits.

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RESUMÉ

PREMIERE OBSERVATION D'UN CONFLICT DIRECT ENTRE L'HOMME ET LA LOUTRE À PELAGE LISSE (*Lutrogale perspicillata*), À ODISHA EN INDE

Les conflits directs entre l'homme et la loutre sont rarement signalés et plus rarement documentés. Les loutres sont des carnivores et des mammifères à la fois aquatiques et terrestres. La plupart des conflits entre l'homme et la loutre sont dus au fait qu'elles volent les poissons dans les engins de pêche et endommagent les filets des pêcheurs, avec pour unique objectif leur subsistance. Cet article mentionne un premier conflit direct entre les loutres et l'homme causant des blessures à trois personnes d'une même famille dans l'état d'Odisha, en Inde. Ce rapport illustre aussi de manière indirecte les conflits entre chien sauvage et faune.

RESUMEN

PRIMER REPORTE DE CONFLICTO DIRECTO HUMANO-NUTRIA LISA (*Lutrogale perspicillata*) EN ODISHA, INDIA

Raramente se reporta conflicto directo Humano-Nutria, y no llega a menudo a ser noticia. Las nutrias son carnívoros, y son mamíferos tanto acuáticos como terrestres. La mayor parte de sus conflictos con humanos se deben al robo de peces de los artificios de pesca y al daño que producen en las redes de pesca de pescadores que lo hacen para sobrevivir. Este artículo reporta el primer conflicto directo entre nutrias y humanos, que causaron heridas a tres personas de una familia en Odisha, India. Este informe también muestra indirectamente los conflictos perros asilvestrados-fauna silvestre.

सारांश –

भारत के ओडिशा राज्य में इंसान और उदबिलाब के बीच हुए संघर्ष का पहले घटना पर आधारित रिपोर्ट ।

मानव-ऊदबिलाव संघर्ष की शायद ही कभी रिपोर्ट की जाती है और शायद ही कभी ध्यान दिया जाता है। ऊदबिलाव मांसाहारी होते हैं; और दोनों जलीय और स्थलीय स्तनपायी। मनुष्यों के साथ उनके अधिकांश संघर्ष मछुआरों के मछली पकड़ने के उपकरण से उनकी मछली चोरी करने की प्रकृति के कारण होते हैं, साथ ही उनके मछली पकड़ने के जाल को नष्ट करने के कारण होते हैं, जो पूरी तरह से एक मछुआरे की आजीविका है। यह पेपर मनुष्यों के साथ ऊदबिलाव के पहले प्रत्यक्ष संघर्ष की रिपोर्ट करता है, जिससे भारत के ओडिशा राज्य में एक ही परिवार के तीन लोग घायल हो गए। इसके अलावा, रिपोर्ट अप्रत्यक्ष रूप से कुत्ते-वन्यजीव संघर्षों को भी दिखाती है।

ସାରାଂଶ –

ଭାରତ ର ଓଡ଼ିଶା ରେ ମଣିଷ- ପାଣି ଓଧ ମଧ୍ୟରେ ହୋଇଥିବା ସାମୁହିକ ସଂଘର୍ଷ ର ପ୍ରଥମ ଉପସ୍ଥାପନା ।

ମଣିଷ - ପାଣି ଓଧ ମଧ୍ୟରେ ସଂଘର୍ଷର କୌଣସି ଉପସ୍ଥାପନାର ନଜିର ନଥାଏ କିମ୍ବା ଗୁରୁତ୍ୱାରୋପ ଦିଆ ଯାଇନଥାଏ । ପାଣି ଓଧ ଏକ ଛନ୍ଦ୍ୟପାୟୀ ମାଂସାଶୀ ପ୍ରାଣୀ ଓ ଉଭୟଚର (ଜଳ ଓ ଛଳ) । ମନୁଷ୍ୟ ସହ ପାଣି ଓଧର ମୁଖ୍ୟ ସ୍ୱନ୍ଦ୍ୱ ରୁଡ଼ିକ ମଧ୍ୟରୁ ମହ୍ୟଜିବୀ କା ଜାଲ ନଷ୍ଟ ଓ ଜାଲରୁ ମାଛ ଚୋରି ପ୍ରକୃତି ଇତ୍ୟାଦିର ସାମୁହିକ ନଜିର ରହିଅଛି, ମାତ୍ର ଏହି ଉପସ୍ଥାପନା ଓଡ଼ିଶାରେ ପ୍ରଥମ ଥର ପାଣି ଓଧ ଓ ମଣିଷ ମଧ୍ୟରେ ହୋଇଥିବା ସାମୁହିକ ସଂଘର୍ଷ କୁ ଦର୍ଶାଇଅଛି । ଉପରୋକ୍ତ ଅଭିଲେଖରେ ଏକ ପରିବାରର ତିନି ଜଣ ସଦସ୍ୟ ମାନେ ପାଣି ଓଧ ସହ ହୋଇଥିବା ଆକସ୍ମିକ ସ୍ୱନ୍ଦ୍ୱ ରେ ଆହତ ହୋଇଥିବା ତଥା ବୁଲା କୁକୁର ଏବଂ ବନ୍ୟପ୍ରାଣୀ ମଧ୍ୟରେ ଲାଗିରହିଥିବା ସ୍ୱନ୍ଦ୍ୱ କୁ ମଧ୍ୟ ଦର୍ଶାଇଛି ।

OSG MEMBER NEWS

The Otter Specialist Group contains 393 members at 22 December 2022..

Since the last issue, we have welcomed 10 new members to the OSG: you can read more about them on the [Members-Only pages](#).

Carlos Galvis, Colombia: I am Head of Populations at Cali Zoo, which has some of the greatest reproductive success with Giant Otters over the last 30 years worldwide. For more than 10 years, I have run the Latin American Studbook for this species. I have worked with Omacha Foundation on rehabilitation protocols for Giant Otters, and am also on the organising committee of the Giant Otter International Workshop.

Thine Moen Heggberget, Norway: I was a research zoologist from 1988 till my retirement a few years ago. My interests were, and remain population ecology, feeding ecology, predation, reproduction, and population dynamics. I mainly studied the Eurasian otter, but also American mink, shrews, reindeer and brown bear.

Shahnawaz Khan, India: I have been working with WWF-India's research and conservation initiatives on key freshwater species in the Indo-Gangetic Plains for more than a decade. I have contributed to the conservation of Smooth-coated otters in the Punjab and Uttar Pradesh states of India. Additionally, I've written several research articles on the conservation ecology of aquatic animals, including Smooth-coated otters. I'm now researching the Smooth-coated Otter's seasonal population dynamics and distribution pattern in the Upper Ganga River system, Uttar Pradesh, India.

Susanna Lewis, Peru: I work in the Madre de Dios region or south-eastern Peru, in collaboration with the Frankfurt Zoological Society, where I am working on collecting sighting information and photographs for various reasons, such as creating catalogues of individual otters, building an app that can be used in the field for giant otter sightings, and connecting with any and all entities interested in giant otters.

Silvio Marchini, Brazil: I have been working to disseminate and strengthen interdisciplinary research in wildlife conservation, with an emphasis on its human dimension. I have also been dedicated to developing ways to improve decision-making in wildlife management and policy: strategic planning, theory of change, systems thinking, monitoring and evaluation, group facilitation and capacity building are examples of my areas of interest. Most of my work has involved jaguars, pumas, tapirs, sea lions and dolphins in Brazil and other Latin American countries, and I am very excited about the opportunity to work with this SG and contribute to otter conservation throughout the world!

Averroes Oktaliza, Indonesia: I am currently working on *Aonyx cinereus* distribution in the Ciliwung watershed in the light of pet trade pressure, amongst other threats. I am also working with colleagues to establish an organization dedicated to wildlife conservation called ASTA Indonesia, which will conduct ecological studies and work to protect the otter population in Indonesia.

Carmen Or, China: Currently I am working at WWF-Hong Kong and has been running otter research projects in Hong Kong in recent years. I am currently working on the distribution and population size of this species in Mai Po Nature Reserve using camera traps, sign surveys and molecular analyses. I am also involved in training a spraint detection dog.

Friederike Schröder, Germany: Since 2019, I have worked on “Actionplan Fischotter southwest Lower-Saxony”, monitoring the otter population in three counties in Lower-Saxony as well as doing habitat modelling and carrying out the genetic monitoring. In the course of the project, I have been advertising otter conservation by giving talks and organizing information events for the local community in my study area. My new research interest lies in otter behavior and habitat use. I would like to start a new project next year about otter bridge usage and how to reduce traffic casualties. For this, I hope to find collaborators in the OSG and to benefit from other members’ input.

Karen Arine Souza, Brazil: I am an ecologist, and have been working as a naturalist wildlife guide for 11 years. I joined the Giant Otter Project as a volunteer in 202, and became a member in 2021. I am monitoring giant otters in the Porto Jofre region of Northern Pantanal, andam also seeking to learn and get more involved in human dimensions studies related to otters.

Morten Vissing, Denmark: I work with European Otters at AQUA Akvarium & Dyrepark, Silkeborg, on rescue and rehabilitation. We work with fish farmers on otter exclusion, and with local authorities on construction of otter passes, and the collection of dead otters for research.