

## REPORT

# A CENTURIES-OLD OTTER-FISHING PRACTICE IN BANGLADESH: GOING, GOING, GONE?

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**Abstract:** We assessed the current status of centuries-old traditional otter-fishing in Bangladesh. Field surveys were conducted between July and December 2022, collecting data to evaluate otter populations, the status of otter-fishers, and the challenges of otter-fishing. We recorded a population of 39 Smooth-coated otters, *Lutra perspicillata* owned by 15 fishermen families across two southwest districts. Over a decade, captive otters experienced 77% population decline whilst the otter-fishers have been reduced to 59%. This drastic decrease could be attributed to the loss and degradation of fishing ground resulting in low income for otter-fishermen, which has led the age-old tradition of otter-fishing to be at risk of extinction. We recommend devising a careful management plan and providing incentives for otter-fishers to keep this long-lasting tradition alive for the conservation of otters in Bangladesh.

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**Keywords:** Captive-otters, *Lutra perspicillata*, Narail, Sundarbans

## INTRODUCTION

Humans have coexisted with animals for millennia (Brumm, 2021). Over generations, human-wildlife interactions have evolved as an integral part of traditions where many animal species are of great significance to human culture. Rural communities in particular are considered the guardians of much of the world's biodiversity (Gadgil et al., 1993). For instance, bottlenose dolphins (*Tursiops truncatus gephyreus*) protected by community have been used for fishing by artisanal net-casting fishers in southern Brazil for over a century (Simões-Lopes, 1991). Indeed, the use of otters (*Lutra perspicillata*) in fishing in the southwest regions of Bangladesh showcases a unique example of human-animal interaction being evolved through mutualism. Similar practices were reported from the range of Asia, Europe and African countries where *L. perspicillata* and *L. lutra* have been used for fishing (Medway, 1978). Traditional lifestyles evolved over hundreds of years have developed practices that provided special protection to certain species that are important to the community (Kwapena, 1984). Otter-assisted fishing exemplifies a distinct traditional practice in Bangladesh, where fishermen use otters for earning livelihood (Feeroz et al., 2011). Once a widespread practice that was passed down from father to son throughout many communities in Asia, this is now confined to a few restricted locations in Narail district in Bangladesh.

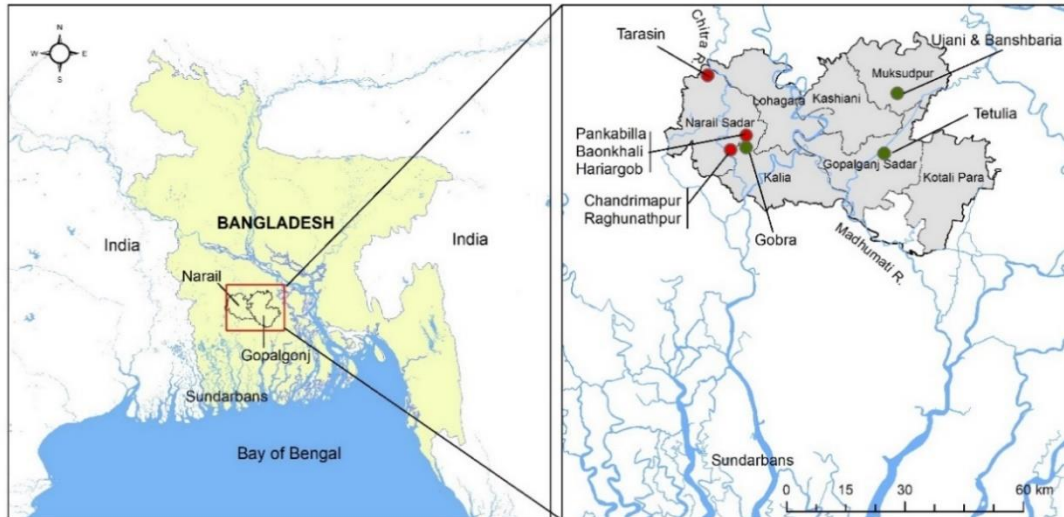
Wild animals are facing burgeoning pressures to coexist with humans due to continued loss and degradation of natural habitats (Narayan and Rana, 2023). However, environmental changes could harm the human-wildlife mutualistic relationship thereby endangering their continued coexistence (Cantor et al., 2023). Species conservation and

the sustainable use of natural resources require reliable information that often came from academic investigations. However, although the bulk of evidence typically stems from academic science, other knowledge systems often receive little attention (Asselin, 2015). Moreover, research findings indicate that local communities offer significant knowledge to the field of conservation and its practices (Berkes et al., 2000). While animal conservation in Bangladesh is largely embedded in formal management practices, the integration of local knowledge in management practices remain largely lacking and unrecognized. One such traditional practice of rearing and breeding globally threatened otter species by the rural community people in Bangladesh receive very little attention from the conservation authorities (Aziz et al., 2008). This puts the age-old traditional knowledge into jeopardy whilst the species may lose its long-lasting connection with humans forever. We explore the interplay to assess how this age-old traditional practice is being threatened by anthropocentric environmental changes.

## METHODS

We conducted field surveys between June and December 2022 for data collection from the owners of captive otters. Based on previous records, we surveyed preselected locations and interviewed all fishermen who owned otters in the region using semi-structured questionnaire. We have collected information on otter populations including their age-sex structure, costs of rearing otters, quantity of fishes they could catch by otter-fishing, including other relevant issues such as the status of wetlands in the area. Data were also collected on socio-economic condition of otter-fishers and income-expenditure related to otter-fishing and the challenges they face for continuing this traditional otter-fishing.

The survey sites include Khulna, Madaripur, Narail and Gopalganj districts in the southwest region of Bangladesh (Fig. 1). With reconnaissance information obtained, we narrowed down our survey effort to Narail and Gopalganj districts where otter-fishers have been currently residing. The Narail district, covering an area of 990 km<sup>2</sup>, consists of three upazila (next lower administrative unit of district) namely Kalia, Lohagara, and Narail Sadar. The overall literacy rate is 46%. The main source of income includes agriculture (62%), fishing, non-agriculture laborer, industry, commerce, transport, remittance, etc. Standing on the bank of the Chitra river, the other major river systems flowing through the Narail district comprise the Madhumati, Nabaganga, Atrai, and Bhairab. Covering an area of 1490 km<sup>2</sup>, the Gopalganj district includes 5 upazila namely Gopalganj Sadar, Kashiani, Kotalipara, Muksudpur, and Tungipara. The main occupation is agriculture (46%) whilst others are pisciculture, livestock rearing, industry, transport, government and private services, commerce, etc. (Bangladesh Bureau of Statistics, 2013). The Garai, Modhumati, Kaliganga, Old Kumar River, Ghagore are the notable rivers of the district. Besides, it has large waterbodies such as *beels*. The rivers including other waterbodies have been used for artisanal fishing by local communities.



**Figure 1.** Location of past (red circle) and present (green circle) otter-fishing families in Narail and Gopalganj districts of Bangladesh.

## RESULT AND DISCUSSION

### Decline of Otter Population

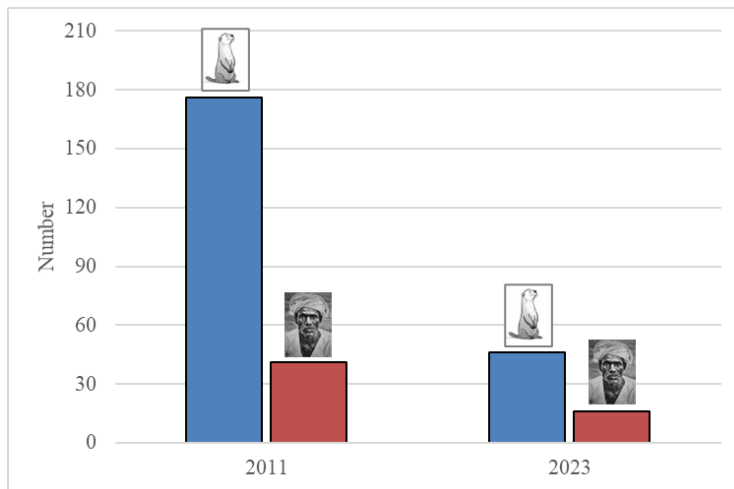
Our survey recorded a total of 41 individuals of otters being used in otter-fishing in Narail and Gopalganj districts of Bangladesh. In the village of Gobra of Narail district, a total of 19 otters belonging to 5 fishermen families were recorded whilst in Gopalganj district 6 families owned a total of 12 otters. Of note, each of the new otter-fishermen at Gopalganj district have only a pair without any evidence of captive breeding whilst the fishermen at Narail district have higher number of otters per family with subadults and infants (Table 1).

**Table 1.** Population structure of *L. perspicillata* captive otters in Narail and Gopalganj of Bangladesh.

District Name	Upazila (Sub-District) Name	Village Name	Owner Name	Otter Population <sup>a</sup>				
				AM	AF	SAM	SAF	I
Narail	Narial Sadar	Gobra	Robin	1	1	-	-	-
			Roben	1	2	-	-	-
			Voben	2	1	1	-	-
			Shyam	1	1	-	-	3
			Dhurrpo	2	2	-	1	-
Gopalganj	Muksudpur	Ujani	Prodeep	2	2	-	-	-
			Shanjeev	2	2	-	-	-
			Satya	2	2	-	-	-
			Gosai	2	2	-	-	-
			Sontosh	2	2	-	-	-
	Gopalganj Sadar	Tetulia	Gonesh	2	2	-	-	-
			Bidhan	2	2	-	-	-
			Bikash	2	2	-	-	-
			Khudiram	2	2	-	-	-
			Tapan	2	2	-	-	-

<sup>a</sup>Otter population: AM – adult male, AF – adult female, SAM – subadult male, SAF – subadult female, I – infant

Our present count of captive otters and the respective number of otter-fishermen is remarkably low comparing the previous records (Fig 2). For instance, Feeroz et al. (2011) reported a population of 122 captive otters from Narail district a decade ago. They also reported another population of 54 otters in Khulna district. In 2011, another study documented a total of 27 families with a population of 97 otters dispersing across 7 villages in Narail district (Hasan, 2011). Conversely, this study found 19 otters in Narail and 20 otters in Gopalganj; however, no otters were found in Khulna district. This data shows a population decline of 77% by a decade. In Gobra village alone, the rate of population reduction is even higher (80%). During 1990s, a premier study reported a population of approximately 500 otters used in otter-fishing across five districts of Bangladesh; however, details remain unknown (Kashem, 1997). If we take this record into account, the rate of decline could be even far-reaching.



**Figure 2.** Decline of otter population and otter-fishermen between 2011 and 2023 in Bangladesh.

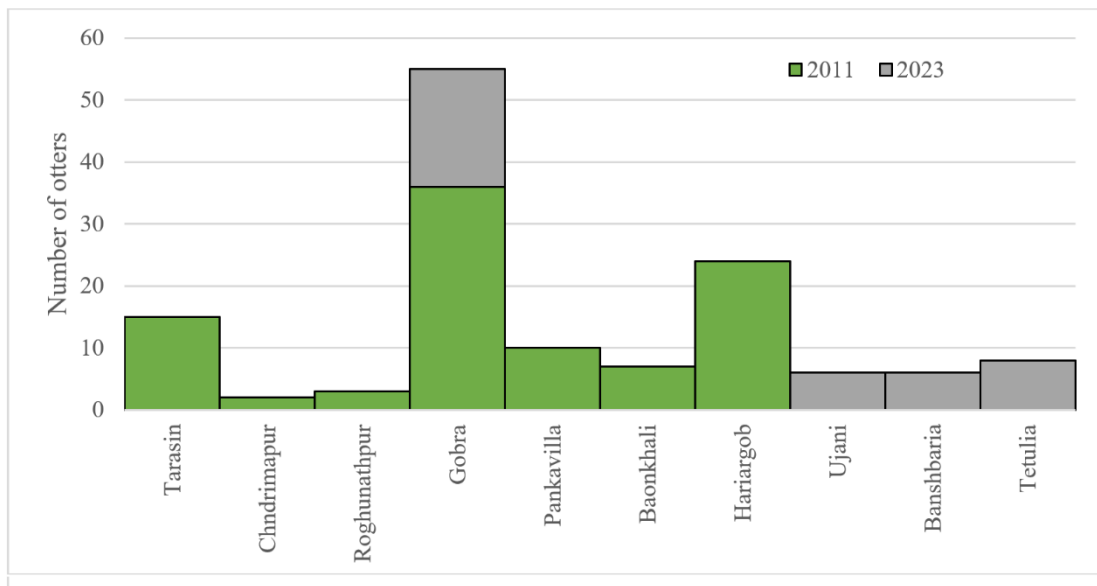
The otter-fishers at Gobra village are highly skilled in breeding otters in captivity through their age-old traditional knowledge achieved over generations (i.e., by forming appropriate pair, split up, re-pair, intensive nursing of pups, etc.). It appears that the new otter-fishermen of Gopalganj district maintained only a pair of adult male and female otters; they obtain only adult individuals from Narail if their otters die for some reason. These new otter-fishermen have found it difficult to rear newborn pups from their pair suggesting that they require traditional skills from Gobra otter-fishermen for successful breeding.



**Figure 3.** Otter-fishermen with otters (left) and visitors enjoying otter-fishing (right) in Narail.

### Spatial Changes in Otter-Fishers

We have recorded 5 families owning otters in Narail district whilst 10 families in Gopalganj district do so. However, no otters were found in Khulna involved in fishing, as had been previously reported (Feeroz et al., 2011). About a decade ago, there were 27 families distributed over 7 villages in Narail who used to fish with otters. This figure has now come down to only 5 families in 1 village who retain their otters. Captive otters have disappeared from 5 villages of Narail district and from all locations of Khulna district. However, 6 new families in 3 new villages in Gopalganj district own otters, brought from Gobra village about 10 years ago (Figure 4, Table 1). In the past captive otters existed across 5 districts adjacent to the Sundarbans which now came down to only two districts (Feeroz et al., 2011).



**Figure 4.** Changes in otter population across different geographic locations between 2011 and 2023.

It is quite perplexing to understand why the otter-fishers of Narail are leaving their forefathers' profession whilst a group of fishermen at Gopalganj adopting the same practice. The factors influencing the otter-fishers of Narail district to sell their otters to the fishermen of Gopalganj district remains unclear. One of the reasons might be the continued decrease of fishing opportunities in the upstream regions of Narail which might have forced the otter-fishers of Gobra village to leave this practice. The decline of aquatic organisms, including fishes has been widely reported to be due to the construction of roads and embankments across waterbodies, together with drainage, flood control and natural siltation, the use of pesticides and fertilizers, pollution, upstream damming in major river systems in the region (Islam, 2012). On the other hand, it is also possible that the higher opportunities for fishing and alternative income generation activities (e.g., agriculture and daily labour) during off-season could be advantageous for the fishermen of Gopalganj district.

### The Future of Otter-Fishing

The analysis of our interview data regarding the willingness to keep otters for fishing revealed a bleak future. The insights from interview data show that overall, 38% of the next generation of otter-fishers are not interested in continuing this practice

anymore. In particular, in the village of Gobra, where this unique human-otter mutualism is thought to have originated in the region, none of their next generation are willing to adopt their father's profession. This suggests that the otter-fishing practice will be lost within the current generation of otter-fishers at Narail who are 50-65 years old. The otter-fishers' sons in Gobra, having some levels of education, have now been engaged in other livelihoods such as garment trade, and other businesses. However, the younger generation of otter-fishers in Gopalgonj, aged between 30 and 45 years old, who bought the otters from the Narail district, seem set to continue the practice for now. Their interest in doing so might be linked to the availability of widespread wetlands, rivers and creeks, and less competition with other fishermen. Our interview data also show that the otter-fishers surviving in Narail district currently mainly rely on incomes received from the foreign tourists who occasionally pay visit to enjoy the otter-fishing technique (Fig. 3b).

In the past, the otter-fishers used to fish in the Sundarbans, located approximately 100 kilometers from their village, because it was then profitable. Currently, however, the otter-fishers no longer go to the Sundarbans because each trip costs a lot of money, catches are down, fear of pirates, and complexities for entry permission into the mangrove forest (Feeroz et al., 2011). Moreover, the otter-fishers comprise a small section of the diverse fisher community in the region that uses a wide array of fishing techniques including the 'destructive' (e.g., current net, Chinese fishing net, etc.) fishing tools despite those being illegal according to the Protection and Conservation of Fish Act 1950. Use of these illegal techniques provides higher catches and are likely to further restrict the opportunities for otter-fishing, leading to frustration and low income for the family. We found that otter-fishers in Gobra village now solely rely on lumpsum monies (US\$ 60-120/month) received from occasional visits (1-2 visits/month during winter) made by foreign tourists. Not all otter-fishers in the village get this opportunity equally due to a handful of tourists visiting, during winter months only.

During the 1990s, approximately 5000 local communities were directly and indirectly engaged with otter-fishing in 5 districts of Bangladesh (Kashem, 1997). The number of otter-fishers now stands at only 15 families comprising less than 100 beneficiaries. The decline of fish abundance due to decrease of upstream water flow, river pollution, degradation of river ecosystems, and use of modern fishing tools seriously endangers the future of otter-fishing. Artisanal fisheries assisted by cetaceans are also disappearing due to conflicts between cetaceans and industrial fisheries in the southern Brazil (Tixier et al., 2021).

The diversion of upstream water by the Farakka dam on the Ganges in India has significantly reduced the dry season discharge in the downstream of Bangladesh. One of the ecological consequences of such hydrologic alterations is the reduction of fish and fisheries in the southwestern river systems (Islam et al., 2020). In particular, waters in the Chitra river and associated canals, the major otter-fishing ground in Narail, are significantly reduced in winter months; also, the remaining waters become heavily polluted during winter season (June to September) due to traditional jute retting which might have led to the otter-fishers in crisis during winter months.

On top of that, the otter-fishers have to spend an average of US\$ 3.09 ( $n=15$ ) on food per day per otter, and this has forced the fishermen to feed otters by sacrificing their own meals during crisis periods. All these pressures are driving the otter-fishers of Gobra village to sell their otters and to leave their forefathers' profession.

## CONCLUSION

As human populations continue to grow and spread over natural habitats of wildlife, specifically in the context of Bangladesh, which supports 1180 people km<sup>2</sup>, the need for traditional ecological knowledge and their engagement in protecting threatened animal species is paramount. Therefore, the gathered information on the driving forces that threaten the ancient practice of otter-fishing could be useful in formulating the management plan for the preservation of the otter species. The provision of incentives to otter-fishers, developing ecotourism networks, and integrating their traditional knowledge into continued captive breeding could be considered to keep this centuries-old tradition alive.

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## **RÉSUMÉ: UNE PRATIQUE DE LA PÊCHE A LA LOUTRE ANCIENNE DE PLUSIEURS SIÈCLES AU BANGLADESH : TOUJOURS D'ACTUALITÉ, EN VOIE DE DISPARITION ?**

Nous avons évalué l'état actuel de la pêche à la loutre, tradition vieille de plusieurs siècles au Bangladesh. A cette fin, nous avons mené des enquêtes sur le terrain entre juillet et décembre 2022 en vue de recueillir des données, d'évaluer les populations de loutres et le statut des pêcheurs à la loutre ainsi que les défis de la pêche à la loutre. Les résultats de cette enquête ont permis de comptabiliser une population de 39 loutres à pelage lisse, *Lutra perspicillata*, appartenant à 15 familles de pêcheurs dans deux districts du sud-ouest. En une décennie, les loutres en captivité ont connu un déclin de 77 % de leur population tandis que les pêcheurs à la loutre ont régressé de 59 %. Cette diminution drastique pourrait être due à la perte et à la dégradation des zones de pêche, ce qui a entraîné de faibles revenus pour les pêcheurs à la loutre. Cette situation pourrait conduire la tradition séculaire de la pêche à la loutre à sa disparition. Nous recommandons en conséquence d'élaborer un plan de gestion précis et d'offrir des incitants aux pêcheurs à la loutre afin de maintenir cette tradition séculaire pour la préservation des loutres au Bangladesh.

## **RESUMEN: UNA PRÁCTICA DE PESCA CON NUTRIAS QUE LLEVA SIGLOS EN BANGLADESH: SE VA, SE VA, ¿SE FUE?**

Evaluamos el estado actual de la pesca tradicional con nutrias en Bangladesh, que lleva siglos. Condujimos relevamientos de campo entre Julio y Diciembre de 2022, para coleccionar datos para evaluar las poblaciones de nutrias, el estado de los pescadores con nutrias, y los desafíos de la pesca con nutrias. Registramos una población de 39 nutrias lisas, *Lutra perspicillata*, poseídas por 15 familias de pescadores en dos distritos sudoccidentales. A lo largo de una década, las nutrias en cautiverio experimentaron una declinación poblacional del 77%, mientras que los pescadores con nutrias se redujeron a un 59%. Este drástico descenso podría ser atribuido a la pérdida y degradación de las áreas de pesca, lo que resulta en bajos ingresos para los pescadores con nutrias, lo que ha conducido a la antigua tradición de pescar con nutrias a estar en riesgo de extinción. Recomendamos diseñar un cuidadoso plan de manejo y proporcionar incentivos para que los pescadores con nutrias mantengan viva esta antigua tradición, para la conservación de las nutrias en Bangladesh.

## **শতাব্দী-প্রাচীন ভোঁদড় দিয়ে মাছ ধরা পেশাটি কী হারিয়ে যেতে বসেছে?**

**সার-সংক্ষেপ:** ভোঁদড় দিয়ে মাছ শিকার বাংলাদেশের একটি শতাব্দী-প্রাচীন ঐতিহ্যবাহী পেশা, যা বর্তমানে দেশের কেবল দক্ষিণ-পশ্চিমাঞ্চলেই প্রচলিত আছে। ২০২২ সালের জুলাই থেকে ডিসেম্বর মাস পর্যন্ত জরিপ পরিচালনা করে আমরা এই পেশায় নিয়োজিত জেলে সমাজ এবং ভোঁদড়ের বর্তমান অবস্থা পর্যবেক্ষণ করেছি। এ সময় ভোঁদড়ের সংখ্যা, এই পেশায় নিয়োজিত জেলেদের অবস্থা এবং এই পেশার প্রতিবন্ধকতাগুলো মূল্যায়নের জন্য তথ্য সংগ্রহ করা হয়েছে। আমরা দুইটি জেলায় ১৫ জন মৎস্যজীবী পরিবারের মালিকানাধীন ৩৯টি পালিত ভোঁদড় (*Lutra perspicillata*) রেকর্ড করেছি। গত এক দশকে ভোঁদড়ের সংখ্যা ৭৭% হ্রাস হয়েছে এবং এই পেশায় নিয়োজিত জেলের সংখ্যা



কমেছে ৫৯%। এই পরিবর্তনের কারণ হিসেবে নদীতে মাছ কমে যাওয়া, মাছ ধরায় অন্যান্য জেলেদের আধুনিক প্রযুক্তির প্রয়োগ এবং এর ফলে ভোঁদড় দিয়ে মাছ ধরা জেলেদের আয় কমে যাওয়াকে চিহ্নিত করা হয়েছে, যা প্রাচীন এই ঐতিহ্যকে বিপন্ন করে তুলেছে। আমরা একটি সঠিক পরিকল্পনা ও ব্যবস্থাপনা প্রণয়ন এবং মৎস্যজীবীদের উৎসাহ প্রদান করার সুপারিশ করছি, যাতে বাংলাদেশে বিপন্ন এই প্রাণীটি সংরক্ষণের মাধ্যমে প্রাচীন ঐতিহ্যটি রক্ষা করা যায়।