

REPORT

NOTES ON POPULATION STATUS AND FEEDING BEHAVIOUR OF ASIAN SMALL-CLAWED OTTER (*Aonyx cinereus*) IN THE SUNDARBANS MANGROVE FOREST OF BANGLADESH

M. Abdul AZIZ

*Durrell Institute of Conservation and Ecology, School of Anthropology and Conservation,
University of Kent, Canterbury, United Kingdom; e-mail: maaziz78@gmail.com*

Abstract: Very little information is available on population status, distribution and ecology of Asian Small-clawed Otter, *Aonyx cinereus* in Bangladesh. By surveying approximately 351 km of water courses in the Bangladesh Sundarbans, 53 individuals of this otter were recorded in 13 groups, with a mean group size of $4.08 \pm SE 1.13$. Mean encounter rate of combined sighting, footprint, and spraint was 0.06/km of rivers surveyed, with higher abundance along the eastern regions of the Sundarbans. Otters were found predominantly feeding on mudskippers (*Periophthalmus* sp.) on the exposed river mudflats, particularly during ebb tide. The chemical pollution in watercourses by several recent cargo incidents within the Bangladesh Sundarbans might have adversely affected otter populations. Systematic otter surveys are needed for a rigorous population assessment to guide conservation effort, and to monitor ecosystem health of the Sundarbans.

Keywords: *Aonyx cinereus*, mudskippers, otter-fishing, sign encounter rate.

INTRODUCTION

Otters have received relatively little attention for field-based research in many of the range states across Asia, despite several species of otters occurring in the region (Foster-Turley, 1992). As a result, scientific information on Asian wild otters has remained largely non-existent (Nawab and Gautam, 2008). Bangladesh is known to support three species of otters, namely the Eurasian otter *Lutra lutra*, the Smooth-coated otter *Lutragale perspicillata* and the Asian Small-clawed otter *Aonyx cinereus*. Unfortunately, they all are endangered in the country (IUCN Bangladesh, 2016), and have been included in the Bangladesh Wildlife (Protection & Security) Act, 2012 for their protection in the wild (MoEF, 2012). Because otters are among the top predators in the wetland ecosystem, they can serve as an important indicator species in monitoring ecosystem health where they occur (Erlinge, 1972). However, very little information is available on these species, except some sighting records in Bangladesh.

Otters are elusive and versatile in adapting to a wide variety of habitats ranging from marine to freshwater wetlands (IUCN, 1992). Bangladesh lies in the largest delta of the world, the Bengal Basin, formed by the three mighty rivers systems of the Ganges, Brahmaputra, and Meghna. The Bengal Basin is a vast lowland, therefore, almost half of the country's land surface can be considered as wetlands (Khan, 1993; Hughes et al., 1994). These enormous wetland habitats support a significant assemblage of wild animals, and possibly foster some unknown otter populations. Previously, the Smooth-coated and Eurasian otters were reported from wetland habitats dispersed across northeast and southeast regions of the country while the Asian Small-clawed Otter was reported from the mangrove forests of the Bangladesh Sundarbans in the southwest (IUCN Bangladesh, 2016). Two previous studies investigated traditional otter-fishing and captive breeding of Smooth-coated Otters in

Bangladesh (Feeroz et al., 2011a, b) yet no studies were undertaken on *Aonyx cinereus* otters in this enormous mangrove habitat. An opportunistic study was therefore conducted on population status and feeding behaviour of the Asian Small-clawed Otter in the Bangladesh Sundarbans.

STUDY AREA AND METHODS

The Sundarbans is the largest single block of tidal halophytic mangrove forest in the world, with a total area of 10,000 km², shared between Bangladesh and India. Bangladesh contains 6,017 km² of the Sundarbans, of which 1,874 km² are wetlands consisting of large rivers, small creeks and canals. Within the Bangladesh Sundarbans, three isolated forest areas have been delineated as wildlife sanctuaries for higher protection wildlife species and their habitat. These wildlife sanctuaries have been declared a UNESCO World Heritage Site in 1997 (Iftekhara and Islam, 2004). The Bangladesh Sundarbans is also a Ramsar site of wetlands of international importance.

During an extensive field survey for a tiger (*Panthera tigris*) study in the Bangladesh Sundarbans led by this author, opportunistic data were collected on direct sighting and signs (e.g., foot prints and sign of spraint) of Asian Small-clawed Otter between November 2014 and March 2015. We surveyed four sample areas: the East Wildlife Sanctuary (383 km²) and West Wildlife Sanctuary (715 km²), Satkhira block (342 km²) and Chandpai block (554 km²) (Fig. 1). From these sample areas, we surveyed 30 river segments, with 50 m to 800 m wide for reliable spotting of otters or their signs (e.g., footprints or spraint) of occurrence. Water-based vessel such as traditional country boat and relatively smaller engine-driven boat were used during the survey.

Five survey teams were employed, each with four members – one data recorder, two observers to spot on the either side of river and one member for guiding the boat. We recorded geographic coordinates of sighting, number of individuals, footprints, and spraint of otters, using handled Garmin *GPSMAP 64*. These data were then imported within Geographic Information System (GIS) using ArcGIS 10.3 to deduce spatial occurrence of otters in the Sundarbans.

RESULTS AND DISCUSSION

We managed to survey 351 km of water courses across four sample areas of the Bangladesh Sundarbans, with 97 km in Satkhira block, 78 km in West WS, 101 km in East WS, and 75 km in Chandpai block. We recorded 53 individual otters in 13 locations, alongside signs of footprints and spraints (Fig. 1; Fig. 2A). Mean group size of otters was estimated as $4.08 \pm SE 1.13$ (range = 1-12, n=13). Mean encounter rate of sighting and signs (footprint and spraint) was 0.06/km, with higher in the East WS areas (0.09/km) and lower in the Satkhira block (0.02). Mean encounter rate of direct sighting was 0.03/km, translating into approximately one individual otter in every 30 km of rivers surveyed. Because of the inherent design of the tiger study, this result should be considered preliminary and an underestimate of the otter population in the Sundarbans. The sample area-wise estimates suggest higher abundance of otters across the eastern part of the Sundarbans of Bangladesh (Fig. 1).

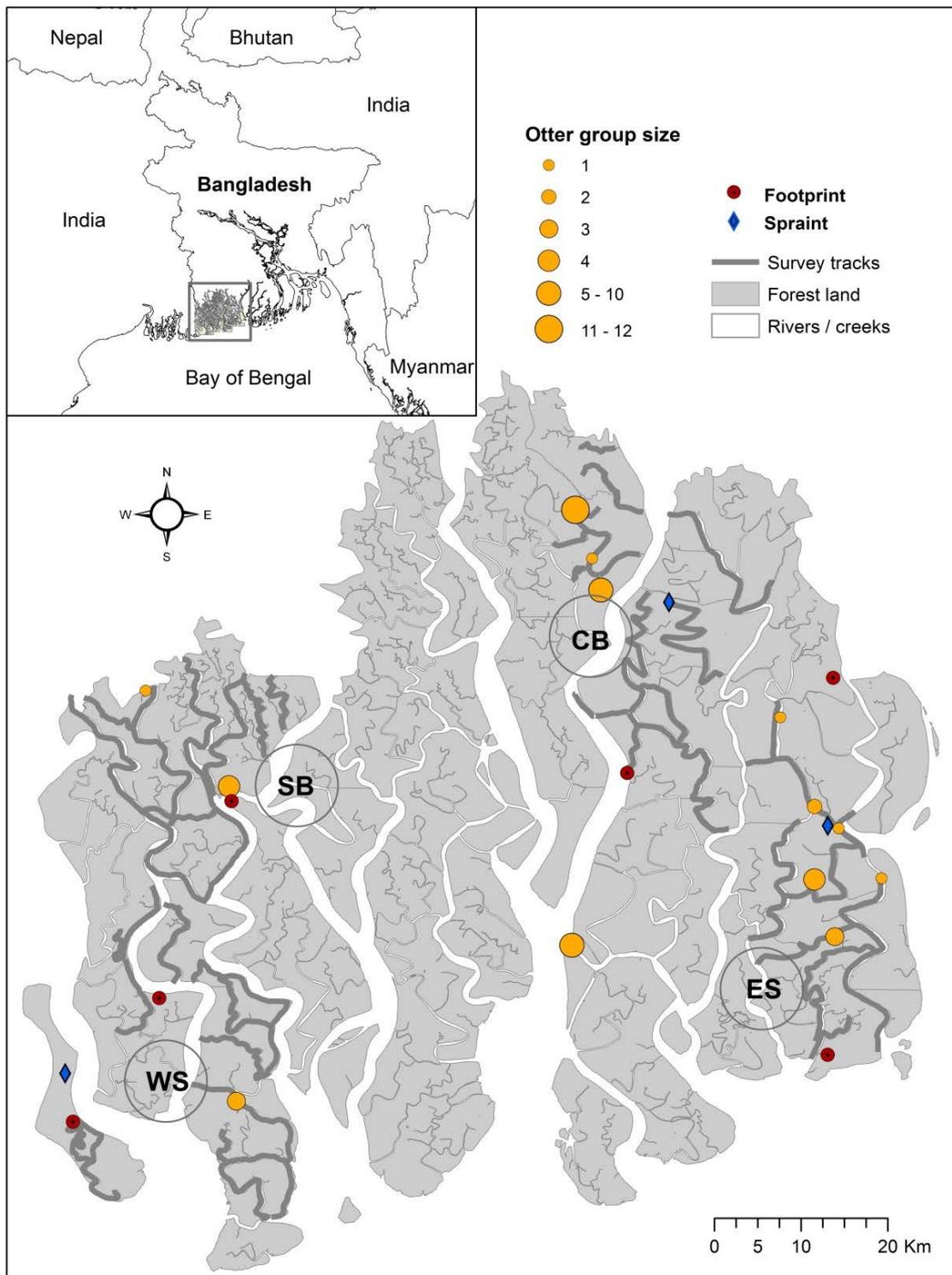


Figure 1. The Sundarbans Reserve Forest of Bangladesh showing river segments surveyed, and locations of sighting, footprint and spraint of Asian Small-clawed Otter. Several data locations outside of the survey tracks were collected opportunistically. The sample areas were indicated as SB = Satkhira block, WS = West wildlife sanctuary, CB = Chandpai block, and ES = East wildlife sanctuary.

Previously the Asian Small-clawed Otter and Smooth-coated Otter had been reported from the Indian part of the Sundarbans (Mallick, 2011), but recently only the former has been seen (Majpekar and Prabu, 2014). While in the Bangladesh Sundarbans, we recorded only the Asian Small-clawed Otter. Of note, we observed traditional fishing with Smooth-coated Otter by local fishermen in the Bangladesh Sundarbans (Fig. 2D).



Figure 2. Otters in the Bangladesh Sundarbans: (A) Asian Small-clawed Otter searching for mudskippers on exposed mudflats; (B) Fish bones and spines in otter spraint; (C) Otter footprints; (D) Fishing with Smooth-coated Otter by local fishermen.

We observed two groups of otters for several hours in two different locations in the southeastern part of the Sundarbans during morning (0915–1040 h) and evening hours (1505–1755 h). As soon as they saw us, the otters quickly disappeared from their foraging ground of exposed mudflats into the nearby forests, but after a while they came out, and started to excavate the burrows of mudskippers, *Periophthalmus* sp. (amphibious fish of the family Gobiidae) with their forelimbs. During ebb tide, mudskippers usually take shelter in their tunnel-like burrows, which are abundant

across the river banks in the Sundarbans. Observations suggest that otters have developed good strategy to catch them by inserting the forearm through one end of the burrow so that mudskippers are flushed out with the water through the other opening. Otters instantly grasped the gobiids, and then started a new session in next burrow (Fig. 3). It has been found that otters came out of shelter to feed when water drained out during ebb tides, providing extensive mudflats with lots of opportunities for feeding on mudskippers.

Analysis of spraint samples (n=3) showed that two samples exclusively contained fish bones and spines (Fig. 2B) while the third one contained a mixture of crab and fish remains. However, larger sample sizes may provide more robust diet profile for otters. Previous studies reported a range of species eaten by the Asian Small-clawed otters elsewhere, including mainly crabs (Foster-Turley, 1992); fish, snakes, amphibians and snails (Maslanka and Crissey, 1998; Kanchanasaka, 2004); and frogs, small birds and octopus (Heap et al., 2008). This study suggests that the major prey organism of this otter species is the mudskippers in the Sundarbans.

Otters are threatened with different degrees of endangerment due to a range of threats in the wild (IUCN, 2016). In the Bangladesh Sundarbans, chemical pollution of watercourses may possibly be the most critical threat to otters. For instances, cargo vessels carrying furnace oil (350,000 litres), chemical fertilizer containing potash (300 tonnes), and coal (1,235 tonnes) capsized in the Shela river in the eastern part of Sundarbans over the last two years. Pervasive pollution through these disasters might have serious consequences on otter populations, particularly in the areas where higher number of otters observed. Otter hunting is common for their skin in trade and other parts for food and traditional medicine in many communities across Asia (Nguyen et al., 2002; Hon et al., 2010). However, skin trade and medicinal use of otter parts is probably rare in Bangladesh but may not be impossible in areas where tiger and their prey poaching were identified as major threat (Aziz et al., 2013).

Habitat destruction, disturbance and occasional drowning in fish traps were also reported elsewhere (Kanchanasaka, 2004; Hon et al., 2010). Habitat destruction and disturbance is minimal for otters in the Sundarbans but trapping by entanglement in fishing gear might occur, due to widespread gear fishing in the watercourses of this mangrove forest.

CONCLUSION

This survey result is preliminary but probably indicates the presence of a large population of the Asian Small-clawed Otters in the Sundarbans. Our observations suggest that the Sundarbans mangrove forest is a stronghold for Asian Small-clawed Otter for their long-term survival. However, there is a growing body of evidence that salinity in the Sundarbans waters is rising due to a significant decline of freshwater flow from the upstream rivers which will undoubtedly affect otter populations alongside the general biodiversity of the Sundarbans (Gopal and Chauhan, 2006). Being one of the top predators in the Sundarbans aquatic ecosystem, otters can be an important candidate species for monitoring ecosystem health. Therefore, robust population assessment of otters is strongly recommended for guiding their future conservation effort and for monitoring ecosystem health of the Sundarbans.

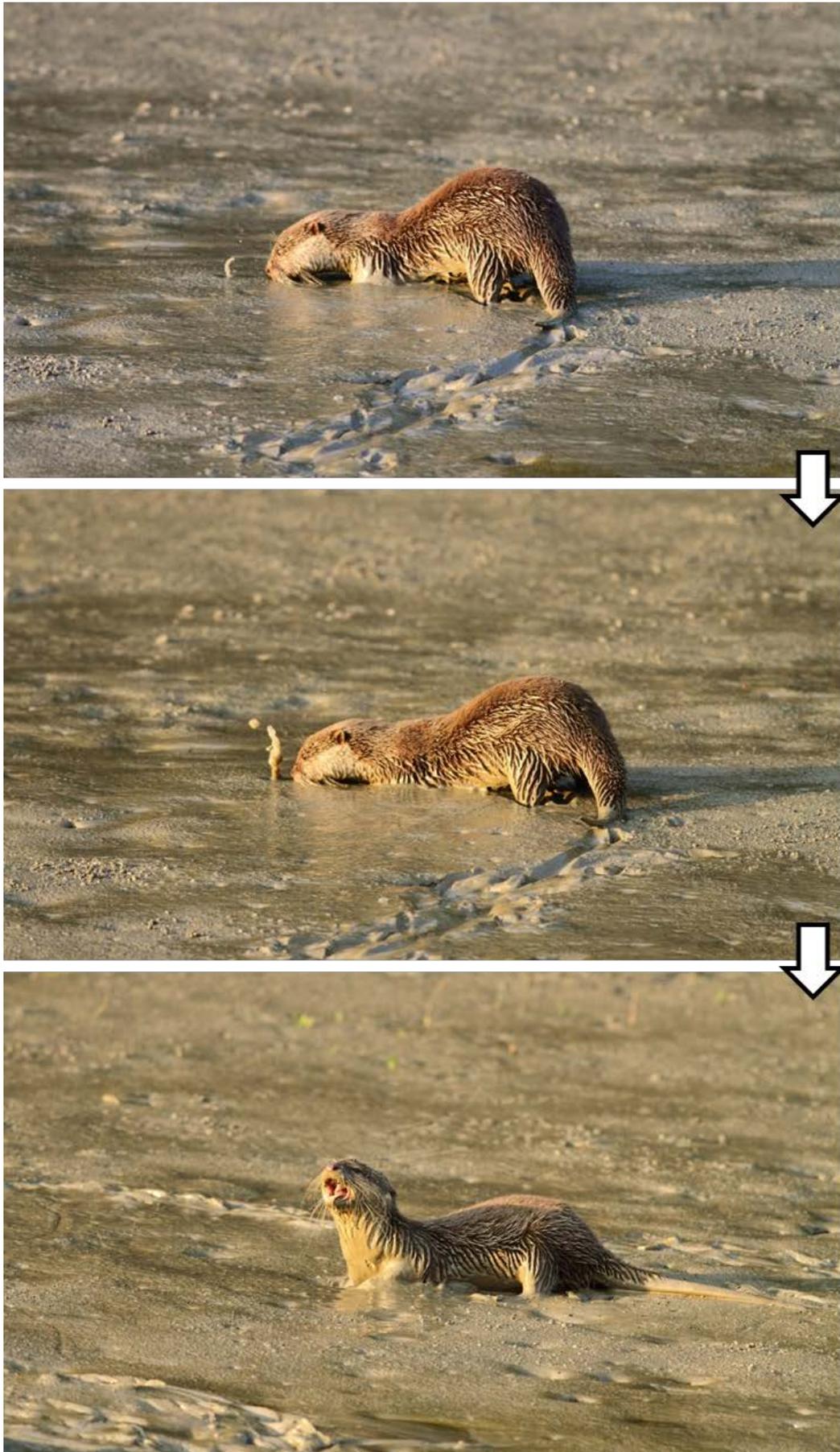


Figure 3. Asian Small-clawed Otter hunting mudskippers: inserting forearms through burrow while mudskipper is being flushed out (top), mudskipper flushed out on the air (middle), and finally eating the catch (bottom).

Acknowledgements - This study would not have been possible without the financial support from the Panthera, Commonwealth Scholarship Commission, UK and WildTeam's BAGH Conservation Activity project supported by USAID Bangladesh. Survey teams, mainly the local honey hunters and fishermen were instrumental in collecting otter data during the tiger survey. The Bangladesh Forest Department provided permission and necessary local support during this work.

REFERENCES

- Aziz, M.A., Barlow, A., Greenwood, C., Islam, M.A. (2013).** Prioritizing threats to improve conservation strategy for the tiger in the Sundarbans Reserve Forest of Bangladesh. *Oryx*, **47** (4): 510-418.
- Erlinge, S. (1972).** Interspecific relations between the otter *Lutra lutra* and mink *Mustela vison* in Sweden. *Oikos* **23**:327-335.
- Feeroz, M.M., Aziz, M.A., Thanchanga, P.K. (2011a).** Breeding activities of *Lutra perspicillata* in Bangladesh. *IUCN Otter Spec. Group Bull.* **28(A)**: 38-44.
- Feeroz, M.M., Begum, S., Hasan, M.K. (2011b).** Fishing with otters: A traditional conservation practice in Bangladesh. *IUCN Otter Spec. Group Bull.* **28(A)**: 14-21.
- Foster-Turley, P. (1992).** Conservation aspect of the ecological of Asian small-clawed otter and Smooth-coated otter on the Malay Peninsula. *IUCN Specialist Group Bull*, **7**: 26-29.
- Gopal, B., Chauhan, M. (2006).** Biodiversity and its conservation in the Sundarban mangrove ecosystem. *Aquatic Sciences – Research across boundaries*, **68** (3): 338-354.
- Heap, C.J., Wright, L.C., Andrews, L. (2008).** Summary of Husbandry Guidelines for Asian Small-clawed Otter in Captivity. IUCN/SSC Otter Specialist Group: Otters in Captivity Taskforce.
- Hon, N., Neak, P., Khov, V., Cheat, V. (2010).** Food and Habitat of Asian Small-clawed otters in Northeastern Cambodia. *IUCN Otter Spec. Group Bull.*, **27(1)**: 12-23.
- Hughes, R., Adnan, S., Clayton, B. D. (1994).** Floodplains or Flood Plans? A Review of Approaches to Water Management in Bangladesh. London: IIED, 1–12.
- Iftekhar, M.S. & Islam, M.R. (2004).** Degeneration of Bangladesh's Sundarbans mangroves: a management issue. *The International Forestry Review*, **6**: 123-135.
- IUCN – The World Conservation Union. (1992).** Otters. Species Survival Commission. 32 pp.
- IUCN – The World Conservation Union. (2016).** The IUCN Red List of Threatened Species. Version 2016-1. <www.iucnredlist.org>. Downloaded on **09 July 2016**.
- IUCN Bangladesh (2016).** Updating Species Red List of Bangladesh: Mammals. IUCN Bangladesh, Dhaka, Bangladesh. Available at <http://www.iucnredlistbd.org/Species/Group?code=MA>.
- Kanchanasaka, B. (2004).** Status and distribution of the hairy-nosed otter (*Lutra sumatrana*). Poster, Ninth International Otter Colloquium, Frostburg, MD, USA.
- Khan, A. A. (1993).** Fresh water wetlands in Bangladesh: opportunities and options. In: **Nishat A, Hussain Z, Roy M K, Karim A**, (eds.). Freshwater Wetlands in Bangladesh - Issues and Approaches for Management. IUCN Bangladesh. Dhaka.
- Mallick, J.K. (2011).** Status of the mammal fauna in Sundarban Tiger Reserve, West Bengal-India. *Taprobanica*, **3**: 52-68.
- Manjreker, M.P., Prabu, C.L. (2014).** Status of otters in the Sundarbans Tiger Reserve, West Bengal, India. *IUCN Otter Spec. Group Bull.*, **31(2)**: 61-64.
- Maslanka, M.T., Crissey, S.D. (1998).** Nutrition and Diet. In: The Asian Small Clawed Otter Husbandry Manual. Columbus Zoological Gardens, Columbus, OH.
- MoEF (2012).** The Wildlife (Protection & Security) Act, 2012. Bangladesh Forest Department, Ministry of Environment and Forests (MoEF), Government of Bangladesh, Dhaka.
- Nawab, A., Gautam, P. (2008).** Otters: can they be saved? In: **Sengupta, M. & Dalwani, R.** (eds.) *Proceedings of Taal 2007: The 12th Lake Conference*: 591-596.
- Nguyen, X. D, Pham, T. A., Nguyen, T. S (2002).** Result of the IOSF Funded Otter Survey in Vo Doi Natural Reserve, Tran Van Thoi and U Minh Hi Fishery-Forestry Enterprise, Southern Vietnam. IOSF, Isle of Skye, Scotland.

RÉSUMÉ

NOTES SUR LE STATUT DE LA POPULATION ET LE COMPORTEMENT D'ALIMENTATION DE LA LOUTRE CENDRÉE (*Aonyx cinereus*) EN FORÊT DE MANGROVE DU SUNDARBANS AU BANGLADESH

Il existe très peu d'informations sur le statut, la distribution de la population et l'écologie de la loutre cendrée, *Aonyx cinereus*, au Bangladesh. Grâce à un suivi d'environ 351 km de cours d'eau du Sundarbans au Bangladesh, 53 individus ont été répertoriés dans 13 groupes, avec une taille moyenne par groupe de 4,08 +/- SE 1,13. Le taux moyen de découverte d'indices de présence qui combine l'observation d'individus, de traces de pas et d'épreintes était de 0,06/km de rivière inventoriée, avec une densité très élevée dans les régions Est du Sundarbans. Les loutres se nourrissaient préférentiellement de périophtalmes (*Periopthalmus* sp.) sur les berges boueuses, tout particulièrement à marée basse. La pollution chimique récente des cours d'eau par des bateaux cargos dans la région du Sundarbans au Bangladesh peut avoir affecté de manière négative les populations de loutre. Un suivi systématique des loutres est nécessaire afin de permettre une évaluation rigoureuse de la population pour orienter l'effort de conservation et suivre l'état de santé de l'écosystème du Sundarbans.

RESUMEN

NOTAS SOBRE EL ESTADO POBLACIONAL Y EL COMPORTAMIENTO DE ALIMENTACIÓN DE LA NUTRIA DE UÑAS PEQUEÑAS ASIÁTICA (*Aonyx cinereus*) EN EL MANGLAR DE SUNDARBANS, BANGLADESH

Hay muy poca información disponible sobre el estado poblacional, la distribución y la ecología de la Nutria de Uñas Pequeñas Asiática, *Aonyx cinereus*, en Bangladesh. Relevando aproximadamente 351 km de cursos de agua en los Sundarbans de Bangladesh, registramos 53 individuos en 13 grupos, con un tamaño medio de grupo de $4.08 \pm SE 1.13$. La tasa media de encuentro (combinando avistajes, huellas y fecas) fue de 0.06/km de ríos relevados, con más abundancia a lo largo de las regiones orientales de los Sundarbans. Encontramos a las nutrias predominantemente alimentándose de “peces del fango” (*Periopthalmus* sp.) en los planos barrosos expuestos, particularmente durante la bajamar. La contaminación química en los cursos de agua a partir de varios incidentes recientes de cargueros en los Sundarbans de Bangladesh, han afectado en forma adversa a las poblaciones de nutria. Se necesitan relevamientos sistemáticos de nutrias para tener una evaluación poblacional rigurosa, que pueda guiar los esfuerzos de conservación, y para monitorear la salud ecosistémica de los Sundarbans.