NOTE FROM THE EDITOR

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Dear Friends, Colleagues and Otter Enthusiasts!

Time is flying and we have real problems to keep pace with the number of manuscripts submitted. So finally, we start issue 2 of this year but we have already many more and I can only promise that Lesley and I will do the best to work on the backlog and reduce it. I hope you all will keep coming back to our website and see what new manuscripts went online. Authors that need a statement that their manuscript has been accepted please contact me and I will provide the necessary documentation.

It would be of real great support if some of you could provide us photos, as we need good resolution pictures for the title page. We are always in need of pictures.

At the end of my editorial note, I have to thank Lesley who is doing a tremendous job with all the articles, last minute changes, post-publication comments from authors etc. Lesley, thank you so much for all your efforts. Merci villmols.

R E P O R T

THE SECOND RECENT RECORD OF HAIRY-NOSED OTTER (*Lutra sumatrana*) IN SABAH, MALAYSIA

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Abstract: A Hairy-nosed Otter (*Lutra sumatrana*) was sighted and photographed in an area near the village of Dagat, Lower Segama, Sabah, Malaysia, on 16th April 2016. Available literature on *L. sumatrana* suggested that this is the second recent record in the state of Sabah, Malaysia. There are 12 confirmed specimen records collected from the island of Borneo. In the Sabah state, there are two specimen records which are from Mengalong River in 1876 and from Sandakan in 1880. All of recent specimen records from the island of Borneo are collected from Brunei Darussalam. In the Sabah state, the first recent record was in Deramakot Forest Reserve in 2010, camera trapped by the carnivores study spearheaded by the Sabah Wildlife Department. The Deramakot Forest Reserve is about 130km away from the present locality record. Due to the paucity of data on the species's population status and its conservation status, it is highly suggested and timely that a state-wide survey of this species be undertaken in order to understand its population status, density and distribution in Sabah.

Key Words: Hairy-nosed Otter, *Lutra sumatrana*, Dagat, Tabin, Ramsar
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The Hairy-nosed Otter (*Lutra sumatrana*) is distributed at scattered locations in Southeast Asia. Records of both collecting and sighting for this species are fewer than for the other two otter species on the island of Borneo (Fig 1). There are 12 confirmed specimen records collected from the island of Borneo: two from Sabah, four from Sarawak, four from Brunei, and two from Kalimantan. All recent specimen records from the island of Borneo are collected from Brunei Darussalam. The latest specimen recorded was a road killed specimen collected at Brunei Darussalam in 1990 (Sasaki et al., 2009).

In the state of Sabah, the status of this species was unknown since there was no recent formally record until one animal was photographed by camera trap at Deramakot Forest Reserve in 2010.

SIGHTING LOCATION

The location of the sighting is a small oxbow lake on state land some 500m east of the village of Dagat, 650m north of Tabin Wildlife Reserve and 600m south of the Ramsar Site. GPS coordinates of the location are 5° 21'52"N 118° 46'45"E. The altitude of the area around sighting location is 20 – 30m a.s.l. (Figure 2, 3).

Figure 1. Map of Borneo Island. The circle in the map shows the east coast of Sabah state, where the two recent *L. sumatrana* records (the 2010 Camera Trap record from Deramakot Forest Reserve and this new observation) have been made, 130km apart

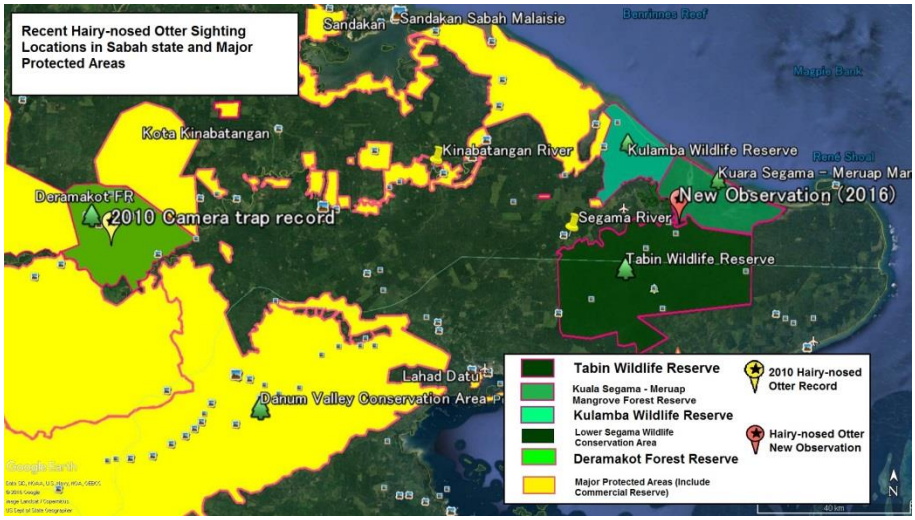

Figure 2. East coast of the Sabah state with *L. sumatrana* sighting locations and the Major Protected Areas. There is no habitat connectivity between the two recent sighting locations which are 130km apart

The 550 acres of state land is a mixture of secondary freshwater swamp forest and lowland dipterocarp forest, containing some oxbow lakes. The nearest river to the sighting location is the Dagat River which is 600m away. Dagat River and Mantis River connect to Tabin River which ultimately flows into the lower part of the Segama River.

The sighting location is in the Tabin Wildlife Reserve (1,225km^2) and the Kuala Segama - Meruap Mangrove Forest Reserve (176.5km^2). The Tabin Wildlife Reserve is the largest wildlife reserve in the state of Sabah, with class VII classified forest. It is mainly covered by lowland dipterocarp forest except the low altitude northern part where it is covered by swamp forests. There is some Primary Forest in the central area which called Core Area.

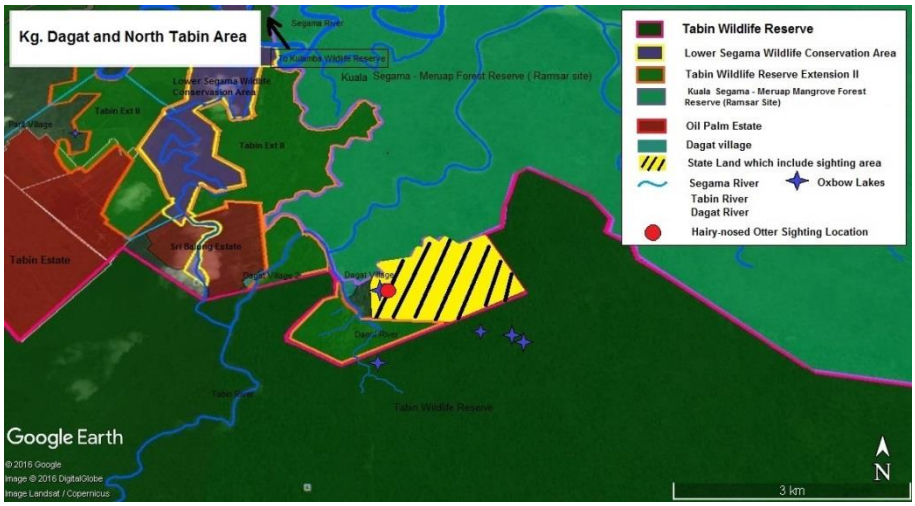

Figure 3. Location of the sighting site in the Tabin Wildlife Reserve and the LKSW Ramsar site, where the freshwater swamp forest and the lowland dipterocarp forest mix.

The Kuala Segama - Meruap Mangrove Forest Reserve contains large scale Nippah swamp forest and Class V Mangrove forest. This Mangrove forest reserve is a part of the Lower Kinabatangan - Segama Wetland Ramsar site (788.03km^2) which is the largest Ramsar site in Malaysia.

There are two connections between the Tabin Wildlife Reserve and the Kulamba Wildlife Reserve which is the second largest wildlife reserve (206km^2) in the state of Sabah, and also a part of the Ramsar site. The connectivity through Kuala Segama – Meruap Mangrove Forest Reserve is wider but almost covered by swamp forest such as Nippah swamp forest and Mangrove forest. Connectivity through the Lower Segama Wildlife Conservation Area (24km^2) along the Tabin River is the only connectivity through dry land. However, the forest is thin and degraded, and also there is abundant human disturbance.

Because of the importance of dry land connectivity between these two largest wildlife reserves, the land beside the Lower Segama Wildlife Conservation Area has been gazetted recently as the Tabin Wildlife Reserve Extension II, the Kulamba wildlife Reserve Extension II, and the Sungai Segama Forest Reserve.

SIGHTING DETAIL

The observation was recorded on the 16th April 2016. The sighting time was between 0936 to 0948 hours as follows:-

0920 hours - The observer was resting at the edge of a small oxbow lake

0936 hours - A lone otter was observed swimming, diving and surfacing in the lake repeatedly

0938 hours - The otter detected the presence of the observer. It swam towards the observer and stopped about 4m away and began to perform threat behavior, uttering short “grrrp” sounds for several minutes before it swam back to the middle of the oxbow lake. The otter then repeated this sequence, going back to

the observer and making threat sounds. The otter repeated this behavior several times. A short video recording was taken; (Figure 4-6)

0948 hours – The otter climbed to the bank of the other side of the oxbow lake.

CONDITIONS

The weather was cloudy. The water level was clear and somewhat at low tide. Some fish, probably Snakehead (*Channa striata)* and Climbing Perch (*Anabas testudineus)* were observed in the lake and those fishes could have attracted the otter. Birds such as Oriental Paradise Flycatcher (*Terpsiphone affinis)* and White-crowned Forktail (*Enicurus leschenaulti*) were observed at the edge of the oxbow lake while some Black-and-red Broadbills (*Cymbirhynchus macrorhynchos*) were nesting on some branches above water.

Due to the lack of, or decrease in, rainfall and prolonged period of drought as an effect of El Niño since 2015, the smaller oxbow lakes, pond and forest rivulets dried up. The water level of the oxbow lake and Dagat River has been drastically reduced several feet by the prolonged drought.

Figure 4. *L. sumatrana* at Dagat Village. The rhinarium covered by short hair

Figure 5. Side view of the *L. sumatrana*‘s head at Dagat Village showing flat skull

DISCUSSION

The solitary otter observed in this site is presumably part of a population different from that camera-trapped in Deramakot Forest Reserve in 2010. The two areas are about 130km away from each other, cut off by settlements, road and other land use. During the sighting, the otter was solitary. It cannot meaningfully be speculated whether the lone otter is a resident of the area or a visitor.

It is possible that after activities of logging and clearance have decreased in the lower Segama River, populations of wildlife come back to this area. This phenomenon augurs well for gazetting of the Lower Segama Conservation Area. The area between the Lower Segama Conservation Area, the Kuala Segama – Meruap Mangrove Forest Reserve and Tabin Wildlife Reserve need further investigation as to the composition of wildlife, include river line species.

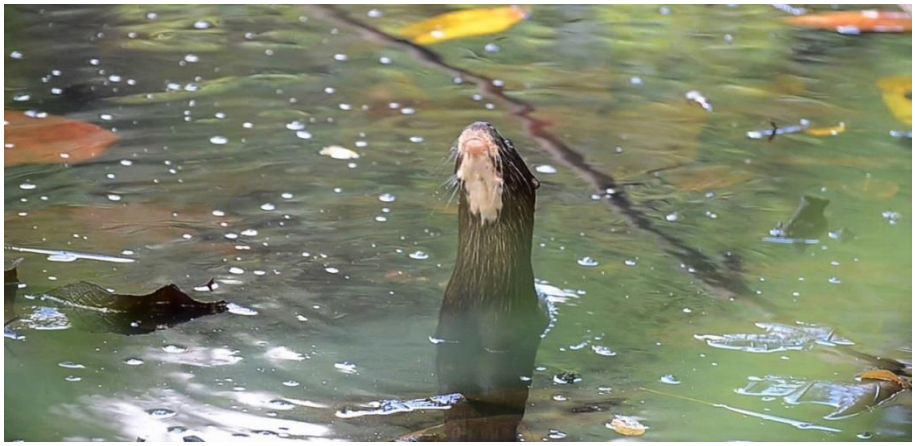

Figure 6. *L. sumatrana* at Dagat Village when it was scanning upward. It is showing white patch on upper lip to under chin clearly.

CONSIDERATION FOR CONSERVATION

The ecosystem between North of Tabin Wildlife Reserve, south of the Lower Segama Conservation Area and the Kuala Segama - Meruap Mangrove Forest Reserve needs to be investigated extensively.

L. sumatrana was reported several times by the fauna surveys conducted by Sabah Wildlife Department though no verification was possible so these cannot be treated as authenticated records. Sabah Wildlife Department believes that this species would occur in the wide range of the state of Sabah.

In view of the endangered conservation status of this particular species, a species management plan is indispensable. Thus, statewide survey on the distribution and the status of the species is a prerequisite for the development of the species management plan as soon as possible.

Acknowledgements - Thanks to Mr. Suhailie Kahar, Mr. Gary Albert and Dr. Prof. Hiroshi Sasaki for helping identify the Hairy-nosed Otter. Thanks to Mr. Yamrin Ramsa and Mr. Hasfian Hassan for bringing me to the sighting site for the first time. Thanks to Mr. Najib Ramsa for helping me to explain to villagers about this sighting report during a village meeting. Thanks to Dagat village people for allowing me to publish this sighting record. Thanks to Dr. Arno Gutleb for proofreading this report and supporting me during finalization of this sighting report. Thanks to Dr. Will Duckworth for reviewing and giving me helpful advice. Thanks to Mr. Toshio Shatani for the corrected Spanish Abstract.

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RÉSUMÉ

LE SECOND ENREGISTREMENT RECENT DE LA LOUTRE DE SUMATRA (*Lutra sumatrana*) AU SABAH, MALAISIE

La loutre de sumatra (*Lutra sumatrana*) a été aperçue et photographiée le 16 Avril 2016 dans une zone proche du village de Dagat dans le bat Segama, Sabah, Malaisie. La littérature disponible sur *L. sumatrana* suggère que cela correspond au second enregistrement dans l'état de Sabah. Il y a 12 enregistrements confirmés de ce spécimen de loutre collectés de l'île de Borneo. Dans l'état de Sabah, il y a deux enregistrements de ce spécimen qui proviennent l'un de 1976 de la rivière Mengalong et le second de 1880 de Sandakan. Tous les enregistrements récents de l'ile de Borneo sont collectés en provenance de Darussalam. Dans l'état de Sabah, le premier enregistrement récent fut dans la réserve forestière de Deramakot en 2010, photographié par l'étude des carnivores menée par le département de la faune de Sabah. La réserve forestière de Deramakot est éloignée d'environ 130 km de la localisation de l'enregistrement présent.

A cause de la pauvreté des données sur le statut de la population de cette espèce et de son statut de conservation, il est hautement suggéré qu'une enquête à l'échelle de l'état sur cette espèce doit être menée pour comprendre le statut de cette population, sa densité et sa distribution au Sabah.

RESUMEN

SEGUNDO REGISTRO RECIENTE DE LA NUTRIA DE SUMATRA (*Lutra sumatrana*) EN SABAH, MALASIA

El 16 de abril de 2016, se realizó un avistamiento de la Nutria de Sumatra (Lutra sumatrana) en el área cercana al pueblo de Dagat Village, Lower Segama, Sabah, Malasia. La literatura disponible sobre L. sumatrana sugirió que este es el segundo registro reciente en el Estado de Sabah, Malasia. Hay 12 registros de muestra confirmados recogidos de la isla de Borneo. En el estado de Sabah, hay dos expedientes del espécimen que son del río de Mengalong en 1876 y de Sandakan en 1880. Todos los expedientes recientes del espécimen de la isla de Borneo se recogen de Brunei Darussalam. En el estado de Sabah, el primer registro reciente fue en la Reserva Forestal de Deramakot en 2010, cámara atrapada por el estudio de carnívoros encabezado por el Departamento de Vida Silvestre de Sabah. La Reserva Forestal de Deramakot está a unos 130 km de distancia de la localidad actual. Debido a la escasez de datos sobre el estado de la población de la especie y su estado de conservación, es altamente sugerido y oportuno que se lleve a cabo una encuesta a nivel estatal de esta especie para entender su estado, densidad y distribución en Sabah.

R E P O R T

REESTABLISHMENT OF GIANT OTTERS IN HABITATS ALTERED BY THE FILLING OF THE TELES PIRES HYDROELECTRIC DAM IN THE AMAZONIA

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Abstract: Studies evaluating the influence of river damming on the behavior and distribution of giant otters are still scarce. Here we present temporal data on the influence of the filling of the Teles Pires Hydroelectric Power Plant reservoir in Mato Grosso State, Brazil, on the records of giant otters. No recent evidence of the presence of giant otters was obtained in the first four months after the beginning of the reservoir's filling. Eight months later, the first direct record of a group of three individuals was documented; one year and six months later, different types of direct and indirect records were documented including that of an active den, which is the main indicative of environment colonization by the species. The giant otters in this reservoir may benefit from the abundance increase in fish species observed in the short term after the dam construction. However, a reduction in prey diversity over the years may be a critical factor for the species' maintenance and survival.

Keywords: Amazon basin, dam, distribution, *Pteronura brasiliensis*, reoccupation, hydroelectric reservoir.

The construction of hydroelectric dams, especially in the Amazon, has proliferated in an unprecedented way as a strategy for energy expansion in Brazil (Lees et al., 2016). Changes in river banks and flow regimes promote impacts of such magnitude that a new ecosystem with completely different properties can be formed (Baxter, 1977; Agostinho et al., 2008). The influence of hydroelectric power plants on the distribution and behavior of giant otters is still scarcely known. The longest study has been conducted since 2001 in the Balbina hydroelectric Power Plant in the Amazon (Rosas et al. 2007, 2009; Cabral et al. 2010). Rosas et al. (2007) observed that giant otters adapted well to the new environment by incorporating several elements of the landscape within their living area, including new formed channels and

islands. However, Palmeirim et al. (2014) highlighted that although giant otters have adapted to the environment, the quality of resources in these areas is inferior to that of non-impacted environments, which may negatively influence the abundance and fitness of the species.

Here we present data on the influence of the filling of the Teles Pires Hydroelectric Power Plant reservoir on records of giant otters along the Paranaíta River in Mato Grosso State, Brazil. The Teles Pires Hydroelectric Power Plant is located at the northern end of Mato Grosso State, on the border with the State of Pará, at 60 km from the municipality of Alta Floresta (Figure 1). It has the capacity of 1,820 MW of power and a lake of 152 km^2 whose filling began at the end of December of 2014 and extended until January of 2015. Giant otters have been studied through the Semi-aquatic Mammal Monitoring Program since June of 2012 in five sections covering the Teles Pires River and its tributaries including the Paranaíta River (Calaça et al., 2015). The sampled section of the studied Paranaíta River (between coordinates 09º24'35'' S; 56º43'46'' W and 09º 35'15" S; 56º 41'14" W) is 34 km long, was one of the areas most affected by the reservoir's filling, and had its margins completely suppressed where considerable extensions of land were flooded (Calaça et al., 2015).

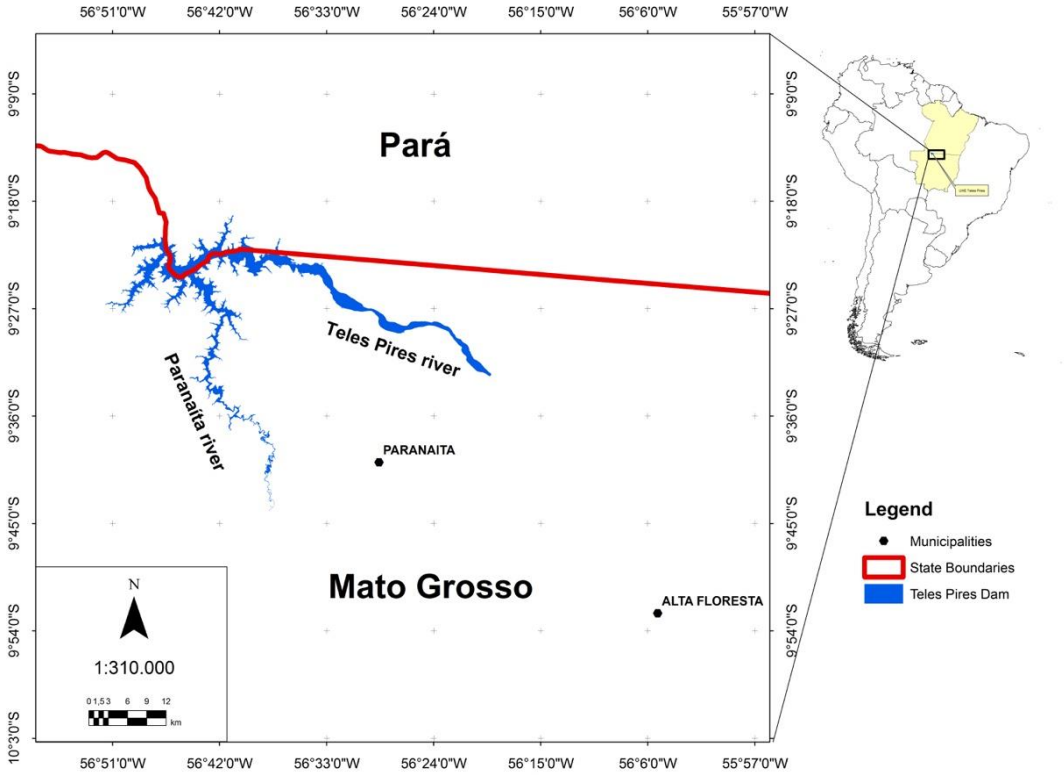

Figure 1. Map of study area at the UHE Teles Pires showing the stretches of the Paranaita and Teles Pires rivers where giant otters were surveyed, on the Northern Mato Grosso State, Brazil.

Sampling campaigns occurred on a quarterly basis during the pre-filling phase (from June of 2012 to December of 2014) and on a semester basis during the post-filling phase (from April of 2015 to the present). In both phases, campaigns last for 10 days and were distributed throughout five stretches with an average effort of 583.4 km per campaign. A 6 m long boat with a 25 HP engine and an average speed of 10 km/h was used to search for any type of evidence of the presence of giant otters.

An effort of 8,168.3 km was used throughout 14 monitoring campaigns in the search for direct and indirect records of giant otters, from which, 1,288 km were traveled in the Paranaíta River. The pre-filling phase included 11 campaigns and allowed the observation of indirect records and five visual records in this river, including three records of solitary individuals, one record of a group of three individuals, and one of a couple (no offspring was observed in these incidents). However, individuals that were well-characterized by their neck marks were observed only in the last two described incidents because the solitary individuals rarely are able to periscope. The first monitoring campaign in the post-filling phase occurred in April of 2015, four months after the beginning of the filling, when only one inactive den was recorded in this period. The first visual record of a group of three individuals that had not previously been characterized was documented at the end of August of 2015, eight months after the beginning of the filling. At the time, the group was out of the water resting on tree branches originated from the lake's deforestation (Figure 2). In December of 2015, twelve months after the beginning of the filling, the same den recorded on the first post-filling campaign was recorded as still inactive. Finally, in June of 2016, we visualized a new group of three individuals in addition to indirect evidence of a resting site (n = 2), an inactive den (n = 1), and an active camping site (n = 1). We also recorded the reactivation of the monitored den, which was the main indicative of environmental recolonization by the species. Therefore, two new groups, composed of three adult individuals each, were visualized in the post-filling phase. The two groups characterized during the pre-filling phase, however, had not yet been visualized during the post-filling phase.

Thus, it was possible to obtain the first evidence, even preliminary ones, of the presence of giant otters eight months after the beginning of the reservoir's filling, culminating with the return of this species and recolonization of the environment mainly observed through the reactivation of dens. Nevertheless, these observations do not allow stating that the environment is adequate for the maintenance of the species and are indications that individuals are trying to adapt to an environment going through significant changes (Calaça et al., 2015). Semi-aquatic mammals, including giant otter, are strongly influenced by the seasonality dynamics observed in their environments (Duplaix, 1980; Utreras et al., 2005; Leuchtenberger et al., 2013).

It is common for individuals to move to small rivers, lagoons, and streams during floods, following fish migration and considerably expanding their living area (Duplaix, 1980; Leuchtenberger et al., 2013). At least two factors may be related to the small number of the species' records observed in the reservoir in the initial phase of the post-filling period: 1) the change in river flow with a rising water column at the beginning of the filling, which may have triggered a dispersion behavior toward adjacent small rivers, which occurs naturally during flood periods and is also reported in other areas of study (Evangelista and Rosas, 2011; Leuchtenberger et al., 2013; Georgiadis et al., 2015). Therefore, many of these areas are of difficult access to researchers, which makes the recording of observations difficult (Rosas et al., 2007; Georgiadis et al., 2015); 2) relevant changes in water quality may also drive the dispersal of giant otters to adjacent small rivers where the water quality is usually less affected (Agostinho et al., 2015). The first few months after the filling of reservoirs represent the most critical phase for species living in aquatic environments because, in addition to physical and spatial alterations, they are affected by the decomposition of plant material, oxygen reduction, and release of large amounts of gases and these events lead to the death of tons of fish as the result of chemical and thermal water stratification (Agostinho et al., 2008). Fortuitous reports have been documented

regarding the presence of groups of giant otters foraging in small rivers and marginal lagoons in farms that are located 3 km away from the studied reservoir area.

Figure 2. Giant otters recorded in the Teles Pires Hydroelectric lake, Mato Grosso State, Brazil. Photo: Luana Monteiro.

According to Rosas et al. (2007), the success in the colonization of environments by giant otters depends on their presence in the area before the disturbance, which was observed during the pre-filling stage in this study, in addition to a minimal degree of human occupation. Oliveira et al. (2015) have also shown that human density is a preponderant factor in the establishment of this species and can greatly influence the number of records. The density of dwellings and people is very small in the studied area, with no evidence of occupation on the reservoir's banks, which is predominantly comprised of pasture that belongs to farms located a few miles away. This aspect may contribute to the successful reestablishment of the species (Duplaix et al., 2015).

The main and largest environmental filter present since the beginning of the reservoir's filling is related to the quality of food resources (Palmeirim et al., 2014). Fish, which depend exclusively on the aquatic environment, are generally most affected by the construction of hydroelectric power plants, especially species with migratory habits that need to seasonally move upstream to complete their reproductive cycle at the headwaters of the great Amazonian rivers (Cella-Ribeiro et al., 2015). Relevant habitat alterations promote a spatial redistribution of fish species in the water column. A significant increase in their abundance is observed due to the high productivity observed in the first months after filling (heterotrophic phase), especially in those sedentary species inhabiting shallow water environments (Agostinho et al., 2008, 2015). Fish with these attributes are generally the most consumed by giant otters in impacted and non-impacted environments (Rosas et al.,

1999; Cabral et al., 2010). Consequently, giant otters may benefit from this sudden increase in the abundance of these resources. A "boom" in these fish species has been observed in the studied reservoir after the filling, including in the monitored section of the Paranaíta River. Nevertheless, a pattern has been observed in the damming of some rivers in which, over the years, the phase of high productivity is succeeded by a period of resource depletion where there is a sharp fall in the quality and quantity of nutrients until the environment reaches the trophic equilibrium, period when fish diversity is reduced (Orsi and Britton, 2014; Agostinho et al., 2015). This transition phase will certainly be critical for the maintenance of giant otters in the Teles Pires reservoir.

The consequent changes in the quantity and quality of resources in a temporal sequence can lead to a cascade of alterations, including the medium and long-term population dynamics of otters such as those observed by Palmeirim et al. (2014) in the Balbina Hydroelectric Reservoir where population growth has considerably reduced when compared to a non-impacted environment. Unfortunately, the small number of visual records obtained in the study area does not allow inferring the rate of births and deaths between the implementation and operation phases of the hydroelectric plant. Nevertheless, the data allows monitoring the overtime variance of the rate of records and composition of groups according to resource abundance and depletion in the post-filling phase. Thus, alterations in the composition of ichthyofauna and in the consequent food diet of giant otters will predict the impact of the formation of this reservoir on the maintenance and survival of this species. These data will only be obtained in the medium and long-term. We can state that the return and reestablishment of the species have occurred in the short-term after eight months from the reservoir's filling. The giant otters in the studied area might at least temporarily benefit from the high abundance of fish observed in the reservoir.

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RESUMÉ

RÉESTABLISSEMENT DES LOUTRES GÉANTES (*Pteronura Brasiliensis*) DANS DES HABITATS ALTERÉ PAR LE REMPLISSAGE DU BARRAGE HYDROÉLECTRIQUE TELES PIRES EN AMAZONIE

Les études évaluant l'influence du barrage de rivière sur le comportement et la distribution de la loutre géante sont toujours peu abondantes. Nous présentons ici des données temporelles sur l'influence du remplissage du réservoir de la centrale hydroélectrique de Teles Pires sur la détection des loutres géantes dans l'état de Mato Grosso au Brésil. Aucune preuve récente sur la présence de loutres géantes n'a été obtenue au cours des 4 premiers mois après le début du remplissage du réservoir. Huit mois plus tard, le premier enregistrement direct d'un groupe de trois animaux a été documenté ; 1 an et demi plus tard, différents types d'enregistrement directs et indirects ont été documentés incluant celui d'une tanière active, qui constitue la principale preuve de colonisation de cet environnement par cette espèce. Dans ce réservoir, la loutre géante pourrait bénéficier de l'augmentation de l'abondance d'espèce de poisson observé après la construction du barrage. Cependant, une réduction de la diversité des proies au cours des années pourrait être un facteur critique pour le maintien des espèces et leurs survies.

RESUMEN

RE-ESTABLECIMIENTO DE LA NUTRIA GIGANTE (*Pteronura brasiliensis*) EN HÁBITATS ALTERADOS POR EL LLENADO DEL EMBALSE HIDROELÉCTRICO DE TELES PIRES, AMAZONIA

Los estudios que evalúen la influencia del represamiento de ríos en el comportamiento y distribución de las nutrias gigantes son aún escasos. Aquí presentamos datos temporales acerca de la influencia del llenado del reservorio de la Planta Hidroeléctrica de Teles Pires, estado de Mato Grosso, Brasil, en los registros de nutria gigante. En los primeros cuatro meses después del comienzo del llenado del reservorio, no se obtuvo evidencia de la presencia reciente de nutrias gigantes. Ocho meses después, se documentó el primer registro directo de un grupo de tres individuos; un año y seis meses después, se documentaron diferentes tipos de registros directos e indirectos, incluyendo una madriguera activa, que es el principal indicador de colonización del ambiente por esta especie. Las nutrias gigantes en este reservorio se pueden beneficiar del incremento en la abundancia de especies de peces que se observó en el corto plazo luego de la construcción de la represa. Sin embargo, una reducción en la diversidad de presas a lo largo de los años puede ser un factor crítico para el mantenimiento y supervivencia de la especie.

SHORT NOTE

INITIATION OF A NEPAL OTTER NETWORK

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The Nepal Otter Network hosted its first collaborative meeting in Kathmandu in January, 2017, with participation of the Nepal Biodiversity Conservation Society, the IUCN Otter Specialist Group, the Himalayan Otter Network, and other organizations. Twelve Nepali otter researchers, from government departments, academia (Tribhuvan University), and the non-profit sector participated in the meeting, and otter conservationists from China and the US.

Nepal Otter Network members

The goals of the meeting were two-fold: to develop a set of priorities for actions to improve the understanding of the status of otters in the country, and to form a collaborative to work together on a continuing basis on issues affecting research and protection of the three otter species in Nepal, the Eurasian otter (*Lutra lutra*), small-clawed otter (*Aonyx cinereus*), and smooth-coated otter (*Lutrogale perspicillata*). All three species face threats from habitat destruction, conflict with fishermen, hydroelectric generation construction, pollution and the illegal trade in otter fur. Nepal is an important hub of the illegal wildlife trade from south Asia to China, and otters are often traded with other valuable animals such as tigers and leopards because of their luxurious pelts.

Urgent objectives for otter conservation in Nepal were discussed and plans made to develop tools to strengthen the protection of otters across the country. Projects initiated included: digital mapping the geographic location of current and past otter research projects, identifying habitat priorities by geographic location, documenting gaps in research, developing a database of illegal otter trade records, understanding the shortcomings of the legal protection status of otters, and creating a library of education and community outreach materials. A first step taken toward standardizing research is a plan to conduct a field training workshop on otter survey that will be offered by Paras Acharya in October, 2017, in Chitwan National Park, Nepal.

Contact Jyoti Bhandari (angeljb7@gmail.com) for more information about the Nepal Otter Network. Charter members of the Nepal Otter Network are: Paras Acharya, Jyoti Bhandari*, Dhruba Bijaya*, Deepak Gautam, HE Bing, Rajesh Jha*, Gandhiv Kafle*, LI Mengjiao, Melissa Savage*, Mohan Bikram Shrestha*, Purna Man Shrestha*, Sanjan Thapa (*members of the OSG). The Himalayan Otter Network is serving as an umbrella organization for this new collaboration. This is an exciting start to an initiative that will create a country-wide strategy for the protection of otter species in Nepal.

Acknowledgement - The Workshop was supported by a generous grant from Wildlife Reserves Singapore.

S H O R T N O T E

RECENT SEIZURES OF LIVE OTTERS IN SOUTHEAST ASIA

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Abstract: The recent spate of otter seizures in Southeast Asia highlight the potential threat of the pet trade on the Small-clawed Otter including the need to further investigate the source of otters in trade and its impact on wild populations.

There has been a recent spate of otter seizures occurring across Southeast Asia, which all took place within the space of a month. In each case the seizures were of juvenile otters. Most of these were Small-clawed Otter *Aonyx cinereus*, a species increasingly favoured in the illegal pet trade.

In Indonesia, a live otter, along with 14 other wildlife species, was seized on 22 February 2017 during a raid carried out by Indonesian authorities in a village in North Tangkerang, Sumatra (Anonymous, 2017). The exact otter species however was not reported. One suspect was arrested and has been charged under Article 29 of Law No. 5/1990 on the conservation of natural resources. The public alerted the Indonesia authorities (i.e. Nature Conservation Agency or Balai Besar Konservasi Sumberdaya Alam (BBKSDA) and Law Enforcement Agency - Region II Sumatra KLHK or Balai Penegakan Hukum Wilayah II Sumatera KLHK) to the suspect who was selling the animals on Facebook.

In Malaysia, also taking place in February 2017, the wildlife authorities undertook a series of raids that led to the seizure of 209 live wild animals destined for the illegal exotic pet trade (TRAFFIC, 2017). In one of these raids, a juvenile Small-clawed Otter was confiscated from a local woman who has been arrested and will be investigated under the Wildlife Conservation Act 2010 (TRAFFIC, 2017).

In Thailand, 26 February 2017, 12 live otters were seized at the Don Mueang International Airport in Bangkok as reported by the Bangkok Post. A Japanese national was arrested for trying to smuggle the live animals into Japan in his luggage. He claimed to have bought the animals at the notorious Chatuchak weekend market (known for the availability of illegal wildlife) for THB15 000 (USD435 as of 28 March 2017) with the intention of raising them as pets back home in Japan. Four of the otters were identified as juvenile Small-clawed Otters, based on a photo of the otters seized (ASEAN-WEN, 2017). However it's uncertain whether the remaining eight otters belonged to the same species. There has only been one other incident where live otters have been seized in Thailand that were intended for international trade-in 2013, TRAFFIC reported five Small-clawed and six Smooth-coated Otter pups seized at Bangkok's Suvarnabhumi International Airport (Shepherd and Tansom, 2013). They were discovered when Customs officers scanned a bag that had been left at the oversized luggage area of the airport. Interestingly, these too were bound for Japan, likely to be sold as exotic pets (Shepherd and Tansom, 2013). Additionally, during recent surveys carried out by TRAFFIC at exotic pet shops and a reptile fair in Japan at least three full-grown Small-clawed Otters were observed for sale.

Lastly in Viet Nam, in March 2017 three juvenile Small-clawed Otters were seized at a wildlife trader's house. Vinh Long Environmental Police together with the Vinh Long Forest Protection Department checked the house after a tip-off received through Education for Nature Vietnam's Wildlife Crime Hotline (Education for Nature Vietnam, 2017). Following this seizure, the trader has declared on Facebook he is shutting down his wildlife trading business. It is unclear from the report whether the authorities are taking any action against the trader.

These cases highlight the threat of the exotic pet industry to otter species: in particular the Small-clawed Otter. Based on a TRAFFIC and International Union for Conservation of Nature (IUCN) Otter Specialist Group preliminary assessment of illegal trade of otters in Asia, there has been a recent spike in the seizure of live otters, which has mostly occurred in Indonesia, Malaysia, Thailand and Viet Nam (Gomez et al., 2016). Additionally, there has been a noticeable shift in the trade of wildlife from physical markets to online markets such as Facebook (Anonymous, 2014; Krishnasamy and Stoner, 2016) which is also the case in at least three of the above mentioned seizures.

While much of the trade in otters as pets has seemingly been to meet domestic demands, the seizure of otters in Bangkok airport indicates the existence of an international market i.e. an illegal trade chain from Thailand and possibly other Southeast Asian countries to Japan.

The Small-clawed Otter is categorized as Vulnerable on the IUCN Red List of Threatened Species due to threats caused by pollution of waterways, reduction of prey, habitat destruction and poaching (Wright et al., 2015). It is listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which means international commercial trade in the species is regulated and can only take place with the relevant export permits. This species is native to all four countries where the seizures have occurred and is totally protected in all of them except Indonesia. Other factors that remain uncertain and need to be investigated further are whether these juvenile otters are poached from the wild or are being captive-bred, as well as what effects the trade is having on wild populations.

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RESUMÉ

SAISIES RECENTES DE LOUTRES VIVANTES DANS LE SUD-EST DE L'ASIE

La récente série de saisies de loutre dans le Sud-Est de l'Asie souligne la menace potentielle du commerce d'animaux de compagnie sur la loutre cendrée incluant la nécessité d'enquêter plus avant sur la provenance des loutres sur le marché et son impact sur la population sauvage.

RESUMEN

INCAUTACIONES RECIENTES DE NUTRIAS VIVAS EN EL SUDESTE DE ASIA

La reciente oleada de incautaciones en el Sudeste Asiático destacan la potencial amenaza que significa el comercio de mascotas sobre la nutria de uñas pequeñas asiática, incluyendo la necesidad de investigar más a fondo el origen de las nutrias que se comercian y su impacto en las poblaciones silvestres.

A R T I C L E

DISTRIBUTION OF AND THREATS TO THE EURASIAN OTTER (*Lutra lutra*) IN THE ANZALI WETLAND, IRAN

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Abstract: The Anzali wetland, located in the south of the Caspian Sea, is considered as one of the most important freshwater ecosystems in that region. It consists of lagoons, marshes, temporary flooded grasslands, ten bigger rivers, fifteen tributary rivers and 550 fish farms. Throughout 2015, otters were surveyed there by searching for tracks and spraints, and also by using rafts, camera traps and interviews with fish farmers. Otter distribution was found to be not uniform and there are also obvious temporal changes of presence. It is more frequent in quiet and less polluted areas with enough food availability. Open water bodies aren't used away from the banks, and edges with weedy vegetation, particularly reeds, are not attractive to this species. These nocturnal animals were observed solitary or in groups of up to three individuals. Signs of otter pups, as the indicator of reproduction, were recorded in August and September. However, environmental degradation, eutrophication and other pollutants in the Anzali wetland threatens the Eurasian Otter population, but it seems that the most important negative factor is casualties caused by conflicts with fisheries and aquacultural activities. The presence of otters was reported by 67% of the fish pond owners around the Anzali wetland. The Eurasian otter population in some regions of the Anzali wetland is very fragile and it seems it is a "threatened" species there. Knowledgeable management of recovery of different habitats and decreasing conflicts with humans is crucial for conservation of this important species in the Anzali wetland.

Keywords: Anzali wetland, Distribution, Eurasian Otter, threat factors

INTRODUCTION

The Eurasian Otter inhabits most rivers and wetland systems in Iran, but it does not mean the species has a high density (Kiabi, 1993; Ziaie and Gutleb, 1997; Mirzajani, 1999; Karami et al., 2006; Rasooli et al., 2007). This species was investigated in a few regions of Iran such as in Jajrood River of Tehran Province by Mirzaei et al. (2009), in the Dorfak region (Hamzehpour, 2006) and the Amirkelayeh wetland (Hadipour et al., 2011) of Guilan Province. Despite its important role in ecosystem functioning, there are many threats to this species. As a result, carcasses

have been found in different regions. Illegal hunting has been observed for fur or taxidermy purposes (Hadipour et al., 2011); most recent conflicts between humans and otters are in relation to fishery activities and around fish farm ponds where many dead otters have been found (Mirzajani, 1999).

The Anzali wetland, as one of the most important freshwater ecosystem in the southern Caspian Sea, is confronted with many problems and negative factors (Mirzajani, 2009), and is listed in the Montreux record as priority site for conservation (Ramsar convention site). During a survey on identification and distribution of mammal fauna in the Anzali wetland (Naderi et al., 2016), the otter, as a top predator in this freshwater system, was extensively studied.

Here, the distribution of the Eurasian otter in the Anzali wetland water body and its main inlet rivers is reported as necessary data for formulation of conservation policies. Furthermore, fish farm ponds around the Anzali wetland have been surveyed, and the main threats for this species in theses areas are described. Also, in order to evaluate Eurasian otter conflicts in relation to human activities, the absence/presence of this species in fish culture ponds around the Anzali wetland and its watershed area was investigated.

MATERIALS AND METHODS

Study area

The Anzali wetland complex is comprised of large, shallow, eutrophic freshwater lagoons, shallow marshes and seasonally flooded grasslands. It extends north-west to south-east of the southwestern part of the Caspian Sea. It consists of four main sections: Siahkeshim, the eastern (Sheijan), the central, and the western parts (Fig 1; S, E, C and W). Area and depth of this complex is subject to seasonal variations of water. It covers an area of 19100 ha with 7000 ha of water body. The average water depth is less than 3 meters. The Anzali wetland acts as an ecotone between different ecosystems: terrestrial, the Caspian Sea, brackish and fresh water environments (Kimbal and Kimbal, 1974). Under DOE conservation management, there is one protected area (Siakeshim) and three wildlife refuges (Sorkhankol, Chokam and Selkeh).

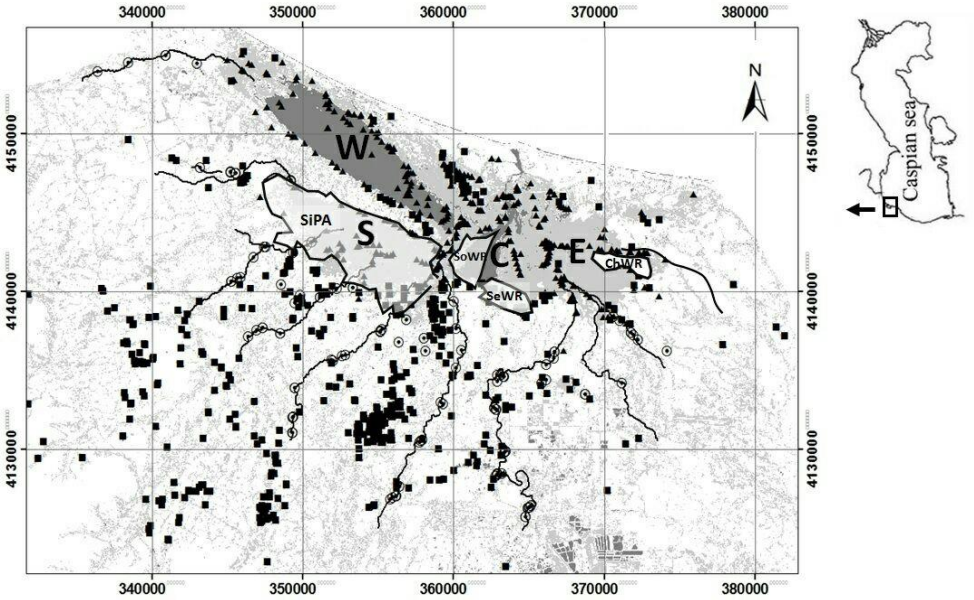

Figure 1. The localities studied for otters: inside the Anzali wetland (black triangles); along the rivers (circles); and fish farm ponds (black squares). Different parts of Anzali wetland: S=Siahkeshim; E= Eastern or Sheijan; C= Central; and W=Western. Areas for conservation programs:; SiPA=Siakeshim protected area; SoWR=Sorkhankol wildlife refuge; SeWR= Selkeh wildlife refuge; ChWR= Chokam wildlife refuge.

The surface area of the Anzali wetland watershed is about 374000 ha with a large number of creeks and rivers. The combined river branches in the highlands form ten rivers in middle altitudes, including Chafroud, Bahambar, Morghak, Masal, Palangvar, Masoolehroodkhan, Pasikhan, Siahdarvishan, Lakanroud and Siahroud (NGO-IRAN, 2003). These rivers are split into many tributaries passing through urban and agricultural areas. Ultimately, fifteen tributary rivers flow into the Anzali wetland complex, while five canals discharge the water directly into the Caspian Sea. The total amount of sediment carried to the wetland is reported to be 390,000 tons/year (Mirzajani, 2009).

Approach

In this study, different parts of the Anzali wetland complex were seasonally patrolled from January 2015 to December 2015 using a speed boat. More than 250 points in the water bodies that make up the Anzali wetland were searched for all signs of otter including spraints, footprints, soil displacement and grooming and rolling areas. In particular, small rocks, heaps of mud and sand, tree trunks, piles of plants, and artificial materials such as cardboard and plastic were carefully examined for spraints.

The survey was obstructed by vegetation growth in spring and summer, so twenty-seven wooden boxes (rafts) were manufactured and installed in different habitats in the Anzali wetland in mid-August (Table 1, Fig. 3a). All rafts were filled with very soft sandy soil, so that the tracks of even the lightest individuals could be recorded. The review and investigation of the rafts was done during successive days, from 18 to 24 August, 5 to 7 September and from 6 to 8 October. Furthermore, Eurasian otter behavior was studied in different parts of Anzali wetland by installing camera traps.

More than 80 other locations were searched for all signs of otter, along the main inlet rivers to the wetland, and about 200-1000 meters along river bank in each location.

According to archived data from the Guilan fisheries organization, about 550 fish farms with a surface area of 2450 hectares have been listed in the Anzali wetland catchment area. About 50% of fish farms were randomly searched for otter signs, and further information was obtained through interviews with fish farm owners. All surveyed fish ponds were inside the city boundaries of Anzali, Rasht and Somesara (Fig. 1).

RESULTS

According to a variety of observed parameters, Eurasian otters are present in the different parts of Anzali wetland. However, the distribution is not uniform in the different seasons in all parts of Anzali wetland (Fig. 2). While many regions such as shore lines, canals or rivers banks were used periodically, others including open water bodies away from the banks and edges with weedy vegetation were not occupied by this species. The rafts installed in this study not only showed the temporal distribution

of adults (Table 1), but also indicated the presence of young otters (Fig. 3a). Permanent presence of otters was observed in some regions such as a destroyed hunting lodge in the western part (raft number 8), in the grasslands of the Siahkeshim protected area (raft 27), in the central part (raft 14) and also in the eastern part (raft 23).

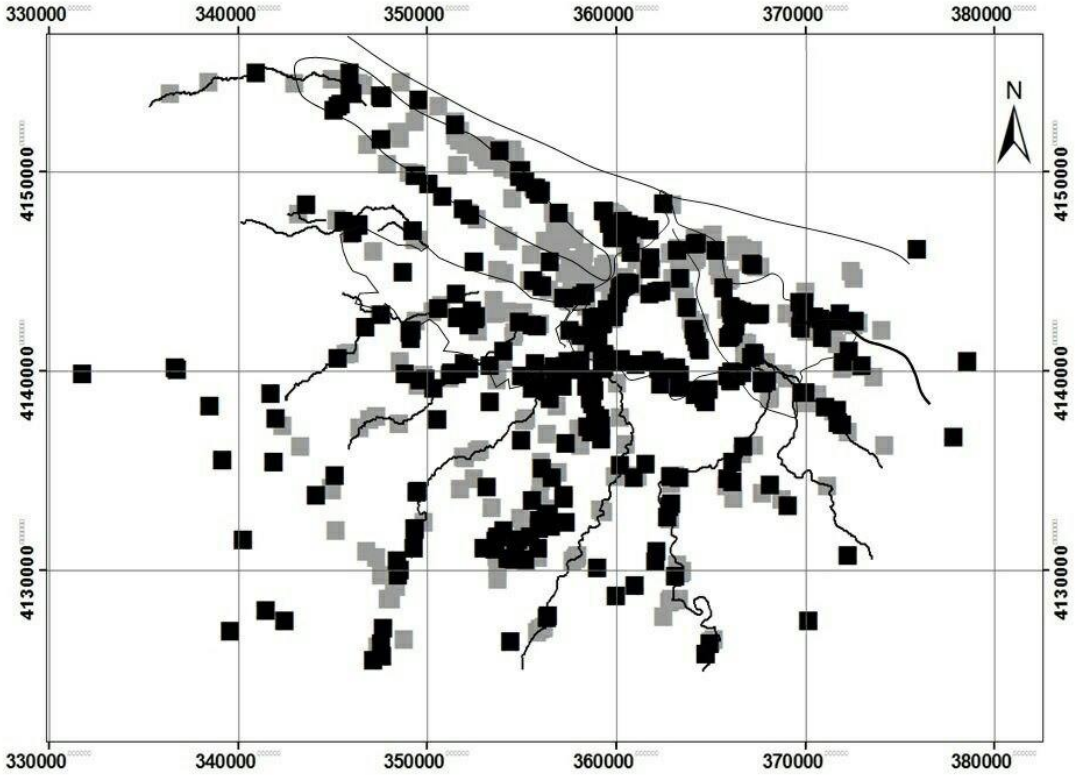

Figure 2. Distribution of Eurasian Otter in the Anzali wetland, around the inflowing rivers and fish farm ponds (square dimension 1×1 Km). The black squares are positive and grey squares were negative for otter sign

Some other regions (indicated by results from rafts 2 and 3 in the western part) are temporary habitats for otters. The open water far away from the banks, such as the rafts 4, 5 and 6 in the Western part, were not used by this species.

The maximum distance of spraints from open water was about 360 meters. No otter signs or tracks were observed on some rafts that had been installed in weedy vegetation at the water's edge (rafts 10 to 13, 18 and 19).

Based on the different data obtained (footprints, spraints), the presence of otter pups was confirmed particularly in August but also September. Furthermore, one female carcass found at the end of August showed clear signs of lactation.

The camera trap data (photos and movies) showed that otters in the Anzali wetland are active nocturnally and are solitary or in groups of up to three individuals (Fig. 3f).

Surveys along rivers also indicated the presence of Eurasian otter. While most of tracks and faeces were observed in undisturbed places along rivers, many signs were also found around places with human activities, particularly on river banks under bridges and roadsides. More spraints were found along Pasikhan and Masoolehrodkhan rivers than on other rivers (Fig. 2).

Interestingly, based on data obtained from about 550 fish farms in the Anzali wetland catchment area, 67 percent of the fish pond owners reported otter presence.

During this study, six carcasses of Eurasian Otter were found in different parts of the Anzali wetland (Fig. 3d). After the death of these individuals, no signs or tracks were found in the adjacent region. Fishery activity is the main reason for killings. These individuals drowned in illegal fishing equipment such as funnel traps (Fig. 3b).

Table 1: Records of Eurasian Otter adults and pups on the 27 installed rafts in various types of habitat in different time periods (Black cell: footprint observation; grey cell: destroyed or submerged raft).

Box number	Habitat Type		August				September			October		
			18	20	22	24	5	6	7	6	7	8
1	H1.S1. V2.T2	Adult										
		Pup										
2	H1.S3.V4.T2	Adult										
		Pup										
3	H2.S2.V2.T2	Adult										
		Pup										
4	H1.S4.V4.T2	Adult										
		Pup										
5	H1. S4.V4.T2	Adult										
		Pup										
6	H1.S4. V4.T2	Adult										
		Pup										
7	H1.S4.V4.T2	Adult										
		Pup										
8	H3.S6.V4.T2	Adult										
		Pup										
9	H1.S1.V1.T1	Adult										
		Pup										
10	H2.S2.V3.T2	Adult										
		Pup										
11	H1.S5.V3.T2	Adult										
		Pup										
12	H2.S2.V1.T2	Adult										
		Pup										
13	H1.S5.V1.T2	Adult										
		Pup										
14	H1.S3.V1.T2	Adult										
		Pup										
15	H1. S3.V1.T1	Adult										
		Pup										
16	H3.S6.V2.T2	Adult										
		Pup										
17	H1.S5.V1.T2	Adult										
		Pup										
18	H1.S5.V1.T2	Adult										
		Pup										
19	H1.S5.V1.T2	Adult										
		Pup										
20	H3.S2.V1.T3	Adult										
		Pup										
21	H3.S2.V1.T3	Adult										
		Pup										
22	H2.S2.V1.T1	Adult										
		Pup										
23	H1.S1.V2.T2	Adult										
		Pup										
24	H2.S2.V3.T2	Adult										
		Pup										
25	H1.S5.V3.T2	Adult										
		Pup										
26	H1.S5.V1.T2	Adult										
		Pup										
27	H2.S2.V2.T2	Adult										
		Pup										

Transports (T)	Vegetation (V) cover type	Substrate (S)	Height (H)
1- Many human transportations (different passenger-recreational boats traffic) 2- Moderate human transportations (recreational fishing) 3- Very low human transportations	1- Weedy plant cover 2- Around of bulrush or reed cover 3- Tree cover 4- Float and submerged aquatic plants cover	1- Sludgy substrate 2- Muddy rigid substrate 3- Sandy or sabulous substrate 4- On the submerged aquatic plants in the water body 5- Weedy substrate 6- Remains of Rick in the water	1- A little above the water surface 2- In edge or on the river bank with low height, up to 50 Cm from the water surface 3- Above the height bank of river, more than 1 m from the water surface

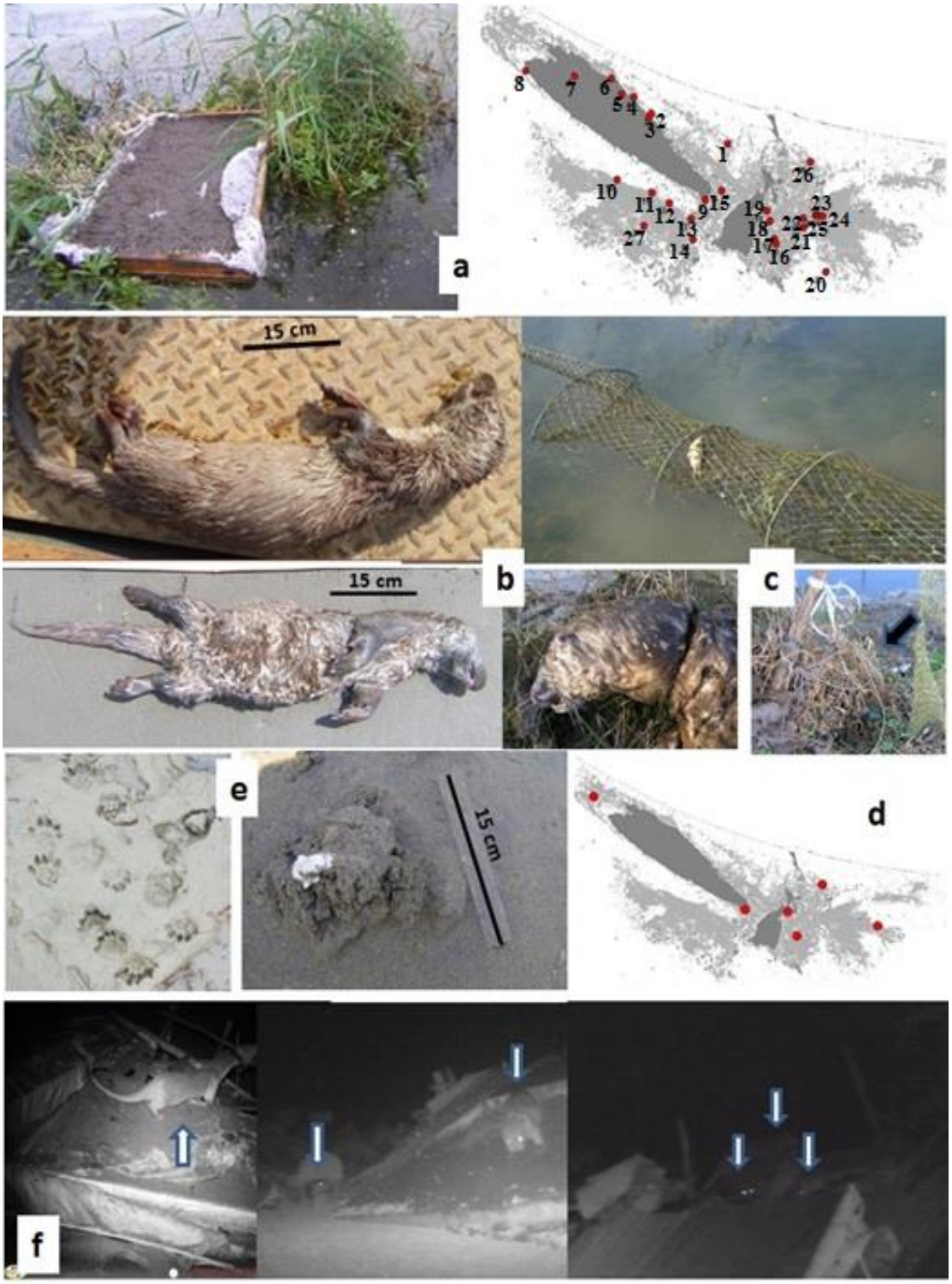

Figure 3. a: Example of rafts installed in different parts of the Anzali wetland (left) and Location of otter carcasses found. **b and c**: Otters killed in fish traps and snares. **d**: Location of the snares and traps found. **e**: spraint and tracks found. **f:** Camera trap photos of Eurasian otter - a solitary animal on a raft, two otters, and a group of three.

DISCUSSION

All otter signs were found in habitats near to water such as rivers, creeks, drains and channels. While otters leave the channels and drain systems of grasslands and dried areas during the drought season, they occupy these habitats in rainy periods. The

lack of otters tracks in water margins with high density vegetation, particularly reeds, (rafts 13, 18 and 19) probably indicate that they are not attractive for Eurasian otter. The lack of tracks in some regions (rafts 10 to 13) in September and later can be related to otter deaths in snares and traps.

The margins of the western open water areas are used periodically by otters (Table 1; rafts 2 and 3), while further away from the margins in the large open water body of the wetland, no otter sign was observed. Canal and riverine environments are sometimes used by this species (Table 1; rafts 16, 17 and 27). All of these data indicate more movements of otters along shore lines rather than the open water bodies.

According to various studies, most otter habitats are described as a narrow strip at the border of land and water (Durbin, 1998; Kruuk, 2006; Prigioni et al., 2006). Thus, shallow banks and small peninsulas are good habitats for this species. This is most likely due to the high energy costs of fishing in deep aquatic ecosystems (Chanin, 2003; Kruuk, 2006). Some other structures e.g. dunes and soft sandy banks are found in different parts of the Anzali wetland, such as regions 14 and 15, that are appropriate for behaviour like fur clearing, grooming and rolling (Table 1).

Despite all of the threats, the tracks of otter pups observed showed the reproduction of this species in the Anzali wetland. Similar otter activity regardless of various anthropogenic disturbances has been reported in other studies (Kruuk and Conroy, 1996; Green and Green, 1997; Kruuk, 1997). *Lutra lutra* has a continuous breeding cycle and the mating season is from February to March or even until July and the young usually stay with their mothers for up to 14 months (Kennedy, 2003).

Eutrophication indices such as chlorophyll-a, nitrogen and phosphorous concentrations, and many forms of environmental degradation (e.g. habitat destruction and fragmentation, extreme sedimentation, different kinds of pollutants) show an increasing trend in the different parts of the Anzali wetland during the last decades (Jica et al., 2005; Mirzajani, 2009, 2010). Although this degradation and the activities of local people indirectly threaten the Eurasian otter population, fishery activity is obviously the main threat for this species here. As well as fishing in the rivers, the fish farms in Anzali wetland are the other cause of conflicts between farmers and otters. While some fish farmers protect the ponds against otters by enclosing, fencing and dogs, others try to kill them by different methods including shooting and snares (Fig. 3c), electric traps etc. Furthermore, the otter is also hunted for its fur and for taxidermy, especially in recent years (Hadipour et al., 2011). Thus it seems that the Eurasian otter population in some regions of the Anzali wetland may be very fragile. Taking into account otter territory size of about 1.6 to 6.5 km (Kennedy 2003), we deduce a low population density of this species around the Anzali wetland.

Our observations indicate that not all rivers or other possible locations are used by otters. Disturbances by people, pollution, low water quality and lack of prey are the main reasons for otter absence. River water use for agriculture and also its natural decline during the cultivation period in spring and summer, plus the high level of activity of local residents causes increasing pressure on this species. Regarding direct observations, the presence of the Eurasian otter at fish farm ponds has increased in recent times. In this study, spraints were more often observed along Pasikhan and Masoolehroodkhan rivers rather than on other rivers (Fig 2). According to the results of different studies (Kortan et al., 2007; Poledníková et al., 2013; Sittenthaler et al., 2015), this fact can probably be attributed to prey abundancy. Ichthyological surveys in the Anzali wetland and its adjoined rivers showed that Pasikhan, Siahdarvishan and Masoolehrodkhan rivers had the most fish species diversity and abundance

(Sadeghinejad Masuoleh, 2017; Abbasi, unpubl.). Tributaries of Siaroud and Lakanroud in downstream catchments had the lowest diversity and abundancy of fishes (Abbasi, unpubl.), and here spraints were rarely found (Fig. 2). The wastewater of Rasht capital city is discharged into these rivers and strongly affects the river`s biodiversity.

The study of macro-invertebrates and physiochemical characteristics in different parts of 12 rivers discharging into the Anzali wetland showed that locations near urban areas just before entering the wetland had a poor to very poor water quality (Mirzajani et al., 2008). Certainly the relationship between fish stocks and otter territories needs to be further investigated in different regions because these stocks change seasonally due to human fishing activities. Fish stock replenishment activities may not affect the number of otter territories because availability of stocked fish is limited to the angling season (Sittenthaler et al., 2015). In fact, permanent food availability is pivotal for otters. On the other hand, based on obtained data from different studies, otter predation does not have a serious impact on commercial fish, and the extent of damage to fish stocks depends on size of the pond, stock density and the season (Kortan et al., 2007; Václavíková et al., 2011; Poledníková et al., 2013; Sittenthaler et al., 2015). Small water basins with a high stock density can be vulnerable to serious damage especially during winter period, when many alternative prey sources are unavailable (Bodner, 1995; Knollseisen, 1995; Kučerová, 1997). Trial studies with different fish species offered to otters showed that size of fish was less important in choice of prey than its mobility (Gossow et al. 1999). Slow moving species of fish with reduced swimming ability were hunted first. Such knowledge of otter feeding behavior can help to predict damage caused to fish stock at ponds, and in reducing losses to otters.

Overall, it seems that *Lutra lutra* may be threatened in the Anzali wetland. Although the presence and distribution of otters has been shown in this study, long time-frame studies, potentially using modern techniques such as satellite or radio tracking, are needed to get more clear and detailed knowledge of this species and its behavior in the specific environment of such wetlands.

Implementation of a habitat rehabilitation plan for recovery and restructuring of some banks and vegetation cover is proposed for the Anzali wetland in order to stabilize conditions and improve access to suitable habitat parameters such as food, cover and space for Eurasian otters. Moreover, sensible conservation measures in the main water bodies of the Anzali wetland, and the appropriate organization of fishing and hunting methods in various ways, such as the regulation of nets or other fishing equipment is important. Finally, decreasing hunting pressure and reduction of conflicts with humans is crucial for the conservation of this species.

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RÉSUMÉ

RÉPARTITION ET MENACE DE LA LOUTRE EURASIENNE (LUTRA LUTRA) DANS LA ZONE HUMIDE D'ANZALI, IRAN

La zone humide d'Anzali, située dans le sud de la mer Caspienne, est considérée comme l'un des plus importants écosystèmes d'eau douce dans cette région. Il se compose de lagunes, marais, prairies temporairement inondées, dix rivières plus grandes, quinze rivières tributaires et 550 pisciculture. Tout au long de l'année 2015, la loutre eurasienne a été étudiée en recherchant des pistes et des empreintes, mais également en proposant des radeaux (Plateformes flottantes), des pièges photographiques et des entretiens avec des pisciculteurs. On a constaté que la répartition des loutres n'était pas uniforme et qu'il y avait également des changements temporels évidents de leur présence. Celle-ci est plus fréquente dans les zones silencieuses et convenables les moins polluées avec suffisamment de ressources alimentaires. Le corps d'eau libre à l'écart des rives et les rives couvertes de végétation herbacée, en particulier des roseaux, ne sont pas attrayantes pour cette espèce. Cette espèce nocturne a été observée solitaire ou en groupe jusqu'à trois individus. De plus, les signes de présence de jeunes loutres comme indicateur de la reproduction ont été enregistrés depuis Août à Septembre. Bien que la dégradation naturelle, l'eutrophisation et la pollution des différentes zones humides d'Anzali menacent la population des loutres eurasiennes, il semblerait que le facteur négatif le plus important soit les pertes causées par les conflits liés aux activités de pêche et d'aquaculture. La présence de loutres a été signalée par 67 pour cent des propriétaires d'étangs à poissons autour de la zone humide d'Anzali. La population de loutre eurasienne dans certaines régions de la zone humide d'Anzali est très fragile et il semble que ce soit une espèce « menacée ». Une gestion compétente pour le rétablissement des différents habitats et une diminution des conflits avec l'homme sont cruciales pour la conservation de cette espèce importante de la zone humide d'Anzali.

RESUMEN

DISTRIBUCIÓN Y AMENAZAS DE LA NUTRIA EURASIÁTICA (*Lutra lutra*) EN EL HUMEDAL ANZALI

El humedal Anzali, al sur del Mar Caspio, es considerado uno de los ecosistemas de agua dulce más importantes de la región. Consiste en lagunas, pantanos, pastizales temporariamente inundados, diez grandes ríos, quince ríos tributarios y 550 pisciculturas. Durantes 2015, relevamos nutrias allí, buscando huellas y fecas, y también ofreciendo balsas ("rafts"), con cámaras-trampa, y entrevistas con los piscicultores. Encontramos que la distribución de la nutria no era uniforme, y también que hay variaciones temporales obvias en su presencia. Es más frecuente en las áreas más tranquilas y menos contaminadas, y con suficiente disponibilidad de alimento. Las porciones abiertas de los cuerpos de agua, lejos de las barrancas, no son usadas, y

las riberas con vegetación enmarañada y especialmente con juncos, no son atractivas para esta especie. Esta especie nocturna fue observada solitaria ó en grupos de hasta tres individuos. También, registramos los signos de crías como indicadores de reproducción, a partir de Agosto y Septiembre. Aunque la degradación de ambientes, la eutroficación y distintos tipos de contaminación en el humedal de Anzali amenazan a la población de nutria eurasiática, el factor negativo más importante es la mortalidad originada en el conflicto con las actividades de pesca y acuicultura. La presencia de nutrias fue reportada por el 67 porciento de los dueños de pisciculturas de la zona del humedal de Anzali. La población de nutria eurasiática en algunas regiones del humedal de Anzali es muy frágil, y pareciera que es una especie amenazada allí. Son cruciales el manejo cuidadoso para la recuperación de los diferentes ambientes, y disminuir los conflictos con los humanos, para la conservación de esta importante especie en el humedal de Anzali.

چکیده :
تالاب انزلی، بعنوان یکی از مهمترین اکوسیستم های آب شیرین جنوب دریای خزر می باشد. آن دربرگیرنده تالاب ها، باتلاق ها، علفزارهای موقتی غرقاب شده، 10 رودخانه بزرگ، 15 شاخه رودخانه ای و حدود 550 استخر پرورش ماهی می باشد. در مطالعه حاضر، وضعیت گونه شاخص شنگ در این اکوسیستم، در طی سال 2015، از طریق بررسی رد و آثار، مدفوع، همچنین نصب تعدادی جعبه چوبی پر شده از شن در مناطق مختلف تالاب، داده های ثبت شده توسط دوربین های تله ای و نیز از طریق مصاحبه با پرورش دهندگان ماهی، مورد بررسی قرار گرفت. بر اساس نتایج به دست آمده، پراکنش شنگ در این منطقه بصورت یکپارچه نبوده و همچنین دارای تغییرات زمانی مشخصی از نظر حضور آن می باشد. بطوریکه، حضور آن در مناطق آرام و زیستگاه های مطلوب با آلودگی کمتر، همراه با قابلیت دسترسی بالا به منابع غذایی، بیشتر مشاهده شد. همچنین، بدنه آبی، در فواصل دورتر نسبت به سواحل و حاشیه های تالاب، کمتر استفاده شده و سواحل همراه با پوشش غنی گیاهی، به ویژه گیاه نی نیز دارای جذابیت کمتر برای این گونه می باشد. این گونه شب فعال، بصورت منفرد و یا در گروه های تا سه فرد، مشاهده شد. همچنین، علائم نوزادان شنگ، بعنوان نمایه ای از فعالیت تولید مثلی این گونه در تالاب انزلی، از ماه های آگوست و سپتامبر، ثبت شد. با وجود آنکه تخریب های طبیعی، پرغذایی و نیز انواع آلودگیها، جمعیت شنگ را در تالاب انزلی تهدید می کند، اما به نظر می رسد که مهمترین عامل منفی اثرگذار بر آن، کشتار ناشی از تعارضات این گونه با فعالیت های آبزی پروری و صیادی انسان می باشد. حضور شنگ ها، در 67 درصد استخرهای پرورش ماهی اطراف تالاب انزلی، گزارش شده است. جمعیت شنگ در بعضی مناطق تالاب انزلی بسیار شکننده بوده و به نظر می رسد که در وضعیت "تهدید شده" قرار دارد. برای حفاظت این گونه مهم در تالاب انزلی، مدیریت علمی در جهت احیاء زیستگاه های مختلف آن و کاهش تعارضات با انسان، حیاتی می باشد.

R E P O R T

HISTORICAL AND CURRENT DISTRIBUTION OF SMOOTH COATED OTTER *Lutrogale perspicillata* IN GUJARAT, INDIA

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Abstract: Three species of otter are found in India, out of them only smooth coated otter *Lutrogale perspicillata* is reported in Gujarat. An extensive literature review was carried out to understand the historical distributions of species, to record current distribution and status; some potential sites and habitat were identified through detail survey. Available literature indicated presence of Otter in 11 different sites distributed in Central, south and north Gujarat. However, present distribution is restricted to Mahi, Narmada and Purna Rivers. Different direct and indirect observation methods including direct sighting, observing trails, tracks and burrows were applied. Survey along the Purna River indicated presence of burrows and direct sightings were reported. However in-depth study is required to ascertain the exact population of otter and threats to the species. Habitat fragmentation, lack of awareness and deficiency of baseline data on status, distribution and ecology of species is constraint of its conservation in Gujarat. Some long term monitoring, habitat restoration and awareness programs to involving relevant stakeholders should be initiated to ensure the survival of species in Gujarat.

Key Words: Smooth coated otter, Gujarat, Distribution, Conservation

INTRODUCTION

Otters form a distinct group within the mammalian family Mustelidae and are grouped into sub-family Lutrinae (Sivasothi, 1995). Among the carnivores, they are only semi-aquatic group (Nowak, 1991). There are 7 genera and 13 species of otter worldwide, of which five are found in Asia. Three species –*Lutrogale perspicillata*

(smooth-coated otter), *Lutra lutra* (Eurasian otter) and *Aonyx cinereus* (small-clawed otter) - are found in India (Reuther, 1991), and only *Lutrogale perspicillata* (smooth-coated otter) is reported in Gujarat.

The smooth-coated otter is widely distributed in South and South East Asia, including Pakistan, India, Nepal, Bhutan, Bangladesh, South West China, Myanmar, Thailand, Vietnam, Malaysia, Sumatra, Java and Borneo (Mason and Macdonald, 1986; Corbet and Hill, 1992).The Smooth-coated otter inhabits lakes, large rivers, dams, irrigation canals, swamps, shallow rice fields and coastal mangroves and prefers sloping banks with vegetation (Menon, 2003). Smooth-coated otters are indicators of the health of a wetland ecosystem because they are sensitive to environmental changes (Nawab, 2009). Ample bankside vegetation provides cover and escape and deep soil is needed for digging holes. Their prey includes mainly fish, supplemented by crabs, insects, mudskippers, frogs, birds and rats (IUCN Otter Specialist Group 2015).

Smooth coated otter is known to be one of the least studied species (Hussain and Chaudhry, 1997). It has been assessed as '*Vulnerable'* by IUCN Red data book of Threatened species (IUCN, 2017) and listed in Appendix II of CITES (Shenoy, 2005). In India the species is protected and listed in Schedule II under the Wildlife Protection Act 1972.

Smooth coated otter is known as *Jalbiladi*, *Ud-bilado*, *Jalmanus* and *Undu* in local language in Gujarat. H.S. Singh (2013) has mentioned, survival of the species is doubted in the state and if they survive the numbers must be very low. However there is no any systematic work on status and distribution of otter carried out in Gujarat. The present study was aimed to document both historical as well as current distribution of the species in Gujarat.

STUDY AREA

Gujarat has varied climatic and geomorphologic conditions (Singh, 2001). Gujarat is very rich in floral and faunal diversity, due to diverse habitat in state such as, longest coastline of country; two out of three Gulfs are present here, plains, mangroves, saline desert, vast grassland, thorny and dry deciduous forest, coastal and inland wetlands. Five major rivers such as Mahi, Tapti, Narmada, Sabarmati and Banas are flows through state from north to south direction.

METHODOLOGY

An extensive literature review was carried out to explore the historic distribution of smooth-coated otter in Gujarat. Apart from gathering secondary information from published and unpublished literature and reports, relevant people in different areas, including the officials of Forest department, Fishermen folk, local villagers, researchers, Naturalists and wildlife photographers were contacted to obtain information about the historical distribution of otter in Gujarat. To gather primary information, all sighting sites were marked on the map, and visited all identified potential sites and habitat for otter. Once direct sighting or indirect evidences were found, GPS location, habitat types, terrain type, vegetation, condition of wetland and potential threats were noted down.

HISTORICAL DISTRIBUTION

Based on the available literature, secondary information and personal communication with local communities and some biologists, the historical distribution of smooth-coated otter in Gujarat was recorded and plotted on a map (Fig. 1). Past

data of sighting shows that the species has scattered distribution in some rivers, ponds and dams of central, south and north Gujarat (Table 1). Broach Gazetteer (1961) mentioned the occurrence of otter in Narmada River and destruction of fish by otter in Tapti River of South Gujarat. Literature showed 9 records of sighting till 1998, after that no major sightings were reported. Small mammal survey in central Gujarat (GES 2007) confirmed the presence of species in state after almost a decade and half a dozen group of otter were direct seen in Mahi River. Singh (2013) mentioned that Mahi and Tapti Rivers supported good number of otters about 20 years ago. Thus, the past records indicated sporadic distribution of the species in various parts of the State.

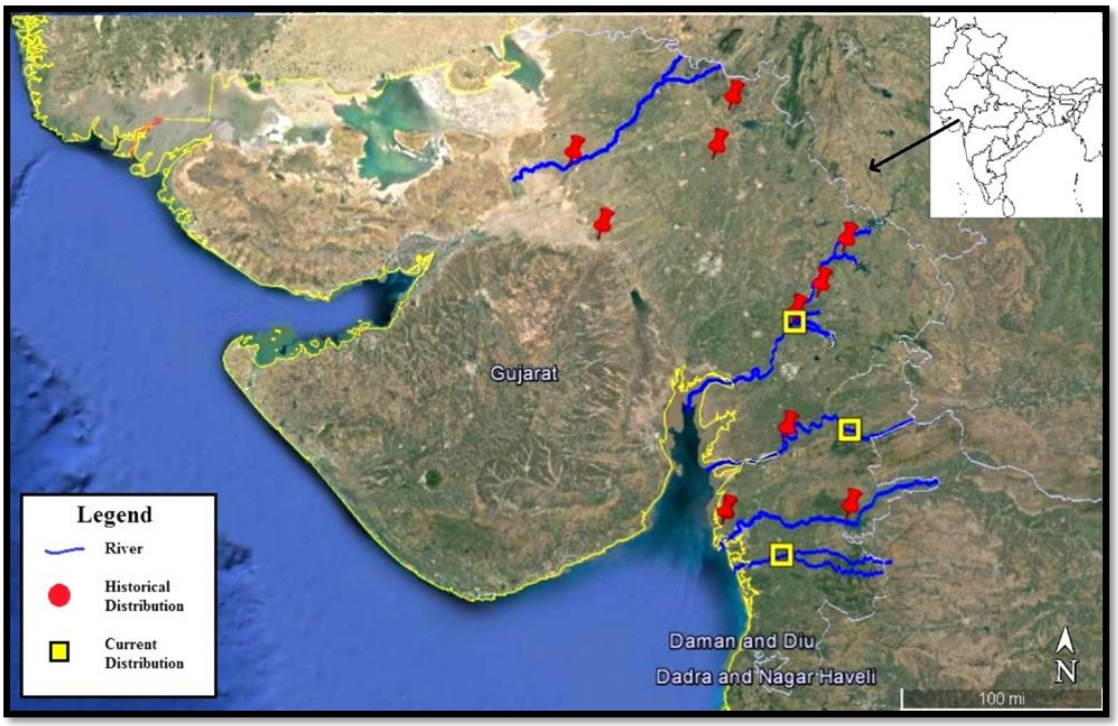

Figure 1. Map showing the historical and current distribution (up to Feb, 2017) of Smooth coated otter in Gujarat

RESULTS

Smooth coated otter have been described in the past for Gujarat (Table 1).

Recent sightings

At three sites viz. Mahi, Narmada and Purna rivers of Gujarat, the Smooth coated otter were directly sighted (Fig. 1) (Table 2). March 2016, five otters were seen in resting activity near Garudeshwar of Narmada River by the first author. Seven otters, busy in fishing activity, have been sighted by first author on June 2016 at Amarapur Village of Mahi River. Two otters were sighted on February 2017 during survey of Purna River near Mahua village. Both were playing in water and out of them, one of the otter was photographed playing with plastic water bottle (Fig. 2). Three burrows of otters were also found near this site (Fig. 3)

Table 1. Sightings of Smooth Coated Otter in Gujarat from literature review

Sr. No	Place	Number	Year of Sighting	Remarks	Source
1	Vadnagar (Pond)	-	-	Singh (2013) is mentioned, this was based on information provided by villagers and could not be confirmed from other authentic source.	Singh (2013)
2	Lunawada (Mahi River)	-	-	Singh (2013) is mentioned, this was based on information provided by villagers and could not be confirmed from other authentic source.	Singh (2013)
3	Ukai Dam (Tapti River)	1	-	Singh (2013) is mentioned, fisherman encountered this animal in Ukai dam and dead animal was also found there.	Singh (2013)
4	Nava Talav (Pond)	-	1966	This was sighted by Mr. Malek at Nava Talav water tank near surendranagar.	Singh (2013)
5	Purna river	-	1970	A school teacher reported the species in Purna river in 1970, but the sighting place is not mentioned.	Singh (2013)
6	Navavas (Village Pond)	2	1987	Mr. M.K. Mahependrasinhji saw a pair of the species before drought in 1987.	Singh (2013)
7	Nikora (Narmada river)	6	1987	S.K. Sinha claimed that he saw a group of 6 individuals in Narmada river in 1987.	Sinha (1989)
8	Timba (Mahi River)	-	1989	Small population of species has been also reported by S.K. Sinha in Mahi river near Timba village.	Sinha (1989)
9	Little ran of Kutch (Banas River)	-	1998	During the mammals' study of Gujarat in 1998, which was carried out by Nita shah, she reported that villagers had seen otters near fringe of Little Rann of Kutch in Banas river.	Singh (2013)
10	Lachhanpura (Mahi River)	5	2007	During survey of Small mammals in central Gujarat. GES team has reported 5 individuals of species in Mahi river near Lachhanpura village. They were playing in water and catching fishes.	GES (2009)
11	Tena Village Pond	1	2011	Otters used to live in the village pond, once woman who was busy in cloth washing was bitten by otter. In return the animal was killed by villagers.	Thakor (2015)

Figure 2. Smooth coated otter in Purna River (top); playing with plastic water bottle (bottom)

Table 2. Present sites of Smooth coated otter existence

Sr. No	Site	GPS Location	Year	No. of individuals	Activity	Habitat description
1	Mahua (Purna River)	21° 1'13.51"N 73° 7'41.32"E	February, 2017	2	Playing with plastic water bottle	Sandy-loam bank substrate with small to medium rock; *Acasia nilotica* along the river side of the bank, and other side Construction going on.
2	Amrapura (Mahi River)	22° 38'13.34"N 73°13'40.44"E	June, 2016	7	Fishing in Flowing water	Rocky river bed; clay bank; small to medium waterfalls. *Prosopis juliflora* dominated area.
3	Garudeshwar (Narmada River)	21° 53' 8.48"N 73°38'51.65"E	March, 2016	5	Resting on sandy island	Island with Sand dunes, one side with medium rock boulders and other side with dense vegetation.

Figure 3. Burrows of Smooth coated otter at Purna River

Figure 4. Sand mining activity nearby otter habitat at Purna River

DISCUSSION

A review of historical records, literature and personal communications with different biologists and naturalists of state revealed that, the isolated population of smooth-coated otter was found and scatteredly distributed in the Mahi, Tapti, Purna and Narmada rivers. Otters were also found at some nearby ponds and dams of these rivers and there is possibility of migration through tributaries and canals during flood time. Present study confirmed the existence of smooth coated otter in 3 rivers of Gujarat viz. Mahi, Purna and Narmada. Presence of three burrows at Purna indicated that, the species regularly used the stretch of river. Thus Purna is one of the prominent and promising sites for survival of otter in state.

The current study suggests that the otter population is facing a decline in Gujarat. The species, which had a scattered distribution in central, south and northern part of Gujarat, is now restricted in isolated population and in fragmented habitat at three sites. Habitat loss is the major reason for dwindling population of Smooth coated Otters and the trend of population decline is expected to continue (Hussain et al., 2008). Sand mining (Fig. 4), constructions along the riverside, water pollution, check dam and lack of awareness in local community are major threats identified during present study. These factors have compelled smooth-coated otter to live in scattered populations in fragmented habitats and roam around continuously for their survival.

There is need for further extensive and intensive studies to exactly map out the distribution of otter in Gujarat and identify the threats as per the riverine system. There are also lacunae of studies on the use of habitat by Otter during different times of the year. Some questions like where, does the Otter move around during low water level in the rivers during the summers or heavy flow during the monsoons needs to be researched. Overall, deficiency of baseline data on Status, distribution and ecology of species is constraint for its conservation. If the threats and stresses it is facing persist,

it will become endangered and its survival will be questioned in Gujarat. Hence, it is mandatory to conserve this species through restoration of its habitats, minimizing the threats, promote greater public awareness and involve local communities in the conservation.

Acknowledgment - Authors are grateful to Gujarat Ecology Commission for sponsoring the ecological profiling study, under which the present findings were reported. We are grateful to Mr. Rathod (DCF, Normal forestry Division -Surat) and Mr. Punit Nayar (DCF, Social forestry division-Surat) for their support to survey team. We are thankful to Sandeep Umaratkar, Alkesh Murli and Rahul Solanki for accompanying during field visits.

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RÉSUMÉ

DISTRIBUTION PASSEE ET ACTUELLE DE LA LOUTRE A PELAGE LISSE *Lutrogale perspicillata* AU GUJARAT EN INDE

Trois espèces de loutre sont présentes en Inde, et parmi elles, seule la loutre à pelage lisse *Lutrogale perspicillata* est recensée au Gujarat. Une recherche étendue de la littérature scientifique a été réalisée afin de comprendre la distribution historique de l'espèce, tout cela pour enregistrer leur distribution et statut actuel ; quelques sites et habitats potentiels ont été identifiés via des surveillances détaillées. La littérature disponible indiquait la présence de loutre à 11 différents sites distribués dans l le centre, le sud et le nord du Gujarat. Cependant, leur distribution actuelle est restreinte aux rivières Mahi, Narmada et Purna. Différentes méthodes directes et indirectes d'observation, incluant les observations directes, l'observation de sentiers, pistes, et terriers furent utilisées. La surveillance le long de la rivière Purna permit de relever la présence de terrier ainsi que de rapporter des observations directes. Cependant une étude plus approfondie est requise pour établir la population exacte de loutre ainsi que les menaces envers cette espèce. La fragmentation de l'habitat, le manque de sensibilisation et l'insuffisance de données sur la population initiale, sa distribution, son écologie des espèces présentes sont des contraintes vis-à-vis de sa conservation au Gujarat. Quelques suivis sur le long terme. Restauration d'habitats et programme de sensibilisation pour impliquer les parties prenantes concernées devraient être initiées pour assurer la survie de cette espèce au Gujarat.

RESUMEN

DISTRIBUCIÓN HISTÓRICA Y ACTUAL DE LA NUTRIA LISA *Lutrogale perspicillata* EN GUJARAT, INDIA

En India se encuentran tres especies de nutria; de ellas, sólo la nutria lista *Lutrogale perspicillata* está reportada para Gujarat. Llevamos a cabo una extensiva revisión de bibliografía para comprender la distribución histórica de esta especie; para registrar su actual distribución y status de conservación identificamos algunos sitios y hábitats potenciales mediante un relevamiento detallado. La bibliografía disponible indicaba la presencia de la nutria en 11 sitios distribuidos en Gujarat central, sur y norte. Sin embargo, la presencia actual está restringida a los Ríos Mahi, Narmada y Purna. Aplicamos diferentes métodos de observación directos e indirectos, incluyendo avistajes, observación de senderos, huellas y madrigueras. El relevamiento a lo largo del río Purna indicó la presencia de madrigueras, y se informaron avistajes directos. Sin embargo, se requiere un estudio en profundidad para evaluar la población exacta de nutrias y las amenazas a la especie. Factores como la fragmentación del hábitat, la falta de conciencia, y la deficiencia de los datos de base acerca del status, distribución y ecología de la especie, limitan y afectan su conservación en Gujarat. Deberían iniciarse programas de monitoreo de largo plazo, restauración de hábitats y concientización para involucrar a los actores relevantes, para asegurar la supervivencia de la especie en Gujarat.

R E P O R T

ILLEGAL OTTER TRADE: AN ANALYSIS OF SEIZURES IN SELECTED ASIAN COUNTRIES (1980-2015) - SUMMARY

(This paper is a summary of a larger report that was published by TRAFFIC and the OSG at the 13th IUCN International Otter Congress in July 2016 and presents an overview of the key findings. The full report is available for download on the TRAFFIC website: http://www.traffic.org/species-reports/traffic_species_mammals95.pdf)

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Abstract: This study is an analysis of records of the seizure of otters by law enforcement agencies in selected Asian countries between 1980 and July 2015. The study was undertaken to understand the extent and scale of the illegal otter trade in Asia, and focussed on four Asian otter species i.e., the eurasian otter (*Lutra lutra*), hairy-nosed otter (*Lutra sumatrana*), small-clawed otter (*Aonyx cinereus*), and the smooth-coated otter (*Lutrogale perspicillata*). All four species were documented in illegal trade, with 161 recorded otter seizures across 15 countries in Asia between 1980 and 2015, involving an estimated 5881 individuals. Otter skins constituted the majority of the seizures, particularly in India, Nepal and China. Since early 2000s, there seems to be a rising demand for otter pups for the pet trade, particularly in Indonesia, Malaysia, Thailand and Viet Nam. While seizure records as a whole were scarce across the region, we conclude that illegal otter trade is persistent and largely unchecked, despite otter species being legally protected across their range.

Key words: illegal otter trade, Asian otters, skin trade, pet trade

INTRODUCTION

Wild otter populations in Asia are declining due to the increasing loss of suitable habitat and human-otter conflicts because of their perceived or actual threat to local and commercial fisheries. A further significant threat to their survival, although little understood, is illegal trade. Historically, the otter trade has had a global occurrence, with the Sea Otter skin trade in North America starting in the 18th century and lasting until the beginning of the 20th century (by which time reintroduction programmes were required to save the species from extinction) (Carlson, 2002; Kruuk, 2006). It was the dense and durable properties of otter furs that made them so valuable in the then flourishing fur business. The historical demand for otter fur has resulted in the hunting of different otter species around the world, and has caused the deaths of hundreds of thousands of animals, driving several species to near extinction in many range States (Foster-Turley and Santiapillai, 1990; Kruuk, 2006; Nawab and Gautam, 2008; Duckworth, 2013).

In Asia, particularly in Bangladesh, India and Nepal, illegal hunting of otters for their skin is ongoing and poses a severe threat to regional otter populations. Early 21st century seizure data suggest that 20–30 percent of the Indian fur trade then involved otter skins (Meena, 2002). Otter poaching on the Indian subcontinent is largely aimed

at meeting the high demand in the Chinese market (WWF, 2015). It has been found that at least 50 percent of otter skins in China originate from India (Ghosh, 2005; Duckworth, 2013). Reports of otter furs being popular for sale in the Tibetan Autonomous Region (TAR) and other provinces of China have further been confirmed by Tsering (2005) and WWF (2007). Past research suggests important markets are also found in Japan, South Korea and the Russian Federation (Kruuk, 2006). While little information exists on otter populations in India, it is known that intensive trapping has resulted in severely fragmented otter populations that are now largely restricted to protected areas (Khan *et al*., 2014). A discussion group on the use of and trade in otters in Asia evolved in the margins of the 7th IUCN International Otter Colloquium in Trebon, Czech Republic, in 1998 (Melisch, 1998). However, the magnitude of the illegal Asian otter trade was particularly evident when remarkable quantities of otter skins were discovered during a joint study by the Environmental Investigation Agency (EIA) and the Wildlife Protection Society of India (WPSI) into the big cat skin trade in China (Banks et al., 2006). Openly for sale in local markets, otter skins were often found alongside Tiger *Panthera tigris* and Leopard *P. pardus* skins (in two years, no fewer than 1800 otter skins were recorded on a single market in Linxia, China). In China, these skins are used as outer linings of coats, to make hats, to embellish traditional garments like the Tibetan Chupa, or as trophies for display during festivals and sporting events.

Otters are also popular as pets, particularly as youngsters. In Indonesia, there are at least 800 private otter owners (IOSF, 2014). Observations of live otters for sale in wildlife markets in Jakarta, Indonesia have increased from incidental observations made in the late 1980s and early 1990s in West Java (R. Melisch, pers. comm., 2016), to become more widespread over the past decade as observed during market surveys across Southeast Asia albeit in small numbers (C.R. Shepherd, pers. comm., 2016).

Apart from scattered information on otter trade, there is very little understanding of the illegal trade of otters in Asia, and therefore little has been done to tackle this trade. In light of this rising threat, TRAFFIC, in partnership with the IUCN/SSC Otter Specialist Group, undertook an analysis of otter seizure records in the region between 1980 and July 2015 (Gomez et al., 2016). The study was initiated to assess the illegal trade in four otter species distributed in Asia: Eurasian Otter (*Lutra lutra*) (Near Threatened on the IUCN *Red List of Threatened Species*), Hairy-nosed Otter (*Lutra sumatrana*) (Endangered), Small-clawed Otter (*Aonyx cinereus*) (Vulnerable) and Smooth-coated Otter (*Lutrogale perspicillata*) (Vulnerable). A fifth Asian species, Sea Otter (*Enhydra lutris*), which occurs in some of the eastern coastal areas of the Russian Federation and has incidentally been observed in northern Japan, was excluded from this study due to its northern Pacific coastal distribution and very different past use and trade dynamics.

METHODS

Records of seizures by law enforcement agencies between 1980 and July 2015 of live or dead otters, and/or their parts and derivatives, in selected countries and territories in Asia were collected and analysed. Information on otter seizures included, when available: date and location of seizure, country/territory or countries/territories, origin and destination of products, seized item type, quantity, and enforcement agencies involved. Formal requests for otter seizure records were sent to all relevant CITES Management Authorities in the following countries/territories across Asia: Bangladesh, Bhutan, Cambodia, China (including Hong Kong), India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, Singapore, Sri Lanka, Thailand, and Viet

Nam. These countries/territories were selected on the basis of their previous involvement in illegal wildlife trade and/or their proximity to known fur-trade hubs (such as India). Not all countries contacted responded to our request for records and of those that did, some did not provide records. Data on seizures were also obtained from other sources, including TRAFFIC, various NGOs and open access sources such as that reported by the online media. Any additional Asian countries where seizure data were encountered during these searches (i.e. Japan, South Korea, Kuwait, the Philippines and the United Arab Emirates) were also included in the database. General trade data, including seizure data, were also extracted from the United Nations Environmental Programme-World Conservation Monitoring Centre (UNEP-WCMC) CITES trade database, a collection of all records of import, export and re-export of listed species, as reported by Parties to the CITES Secretariat. The analysis of illegal otter trade across selected countries/territories in Asia should be considered precautionary, as it is assumed that the analysed seizure records represent only a portion of the actual trade, since only a fraction of illegal trade is intercepted, seized, and/or reported. To avoid overlap between the various sources of data analysed, all seizures compiled during this study were rigorously crosschecked to prevent duplication within the dataset. Seizure data were also omitted where a credible source could not be verified or in cases where details were lacking or vague.

Scope of Data

It must be noted that this study's dataset is far from comprehensive. For nearly all countries/ territories included in this study, annual seizure records (national or CITES) are absent throughout most of the 1980–2015 period. For some years (1982, 1983, 1985 and 1991), no seizure data were found at all. These data deficits may be explained by several factors. Firstly, countries/territories may lack sufficient enforcement efforts, resulting in a small number of seizures and a higher percentage of undetected trade. Secondly, enforcement agencies may neglect to report seizures, causing national seizure data to be incomplete and/or absent. Thirdly, in some cases, national governing bodies may be unwilling to share seizure data with third parties. Finally, because of the trade's inherently secretive nature, large parts of it are bound to go undetected, rendering it impossible to determine its full extent on the basis of seizure data only.

The dataset shows that seizure records for the earlier years of the studied timeframe are scarcer than more recent records. Besides the above-mentioned factors, this scarcity may be explained by the unavailability of older documents and their absence from more modern open source facilities such as the Internet. Other gaps in older records may be explained by the CITES-membership status of the country in question. Some of the analysed countries only became signatories to CITES after 1980. Prior to their CITES-membership, these countries were not obligated to report seizures to the CITES Secretariat. The countries include Bangladesh (CITES signatory in 1982), Cambodia (1997), China (1981), India (1976), Lao PDR (2004), Myanmar (1997), the Philippines (1981), Thailand (1983) and Viet Nam (1994).

The data gaps in this study lead to an underrepresentation of illegal trade records and stand in the way of a comprehensive overview of the illegal otter trade, which is likely to be much larger than the data suggest. Additionally, other potentially important illegal trade channels must be taken into account. Casual browsing of trading websites has hinted at the importance of the Internet in the illegal otter trade although a study of this was outside the scope of the current study.

RESULTS AND DISCUSSION

Fur and Pet Trade

All four species were documented in illegal trade, with 161 recorded otter seizures across 15 countries in Asia between 1980 and 2015, involving an estimated 5881 individuals. A large majority of the recorded seizures took place in India, suggesting both a well-established Indian otter trade, and comparatively effective local law enforcement in that country. The remaining seizures occurred in China and Cambodia and to a lesser extent Nepal. All otter seizures in these countries involved skins in significant quantities, suggesting that otters are specifically targeted by poachers to meet a market demand for their fur. Seizure records suggest that large numbers of otter skins are smuggled from India to China through Nepal. Past research has illuminated important trade routes between India, Nepal, and China (Banks, 2004; Banks et al., 2006; Verheij et al., 2010; Stoner and Pervushina, 2013).

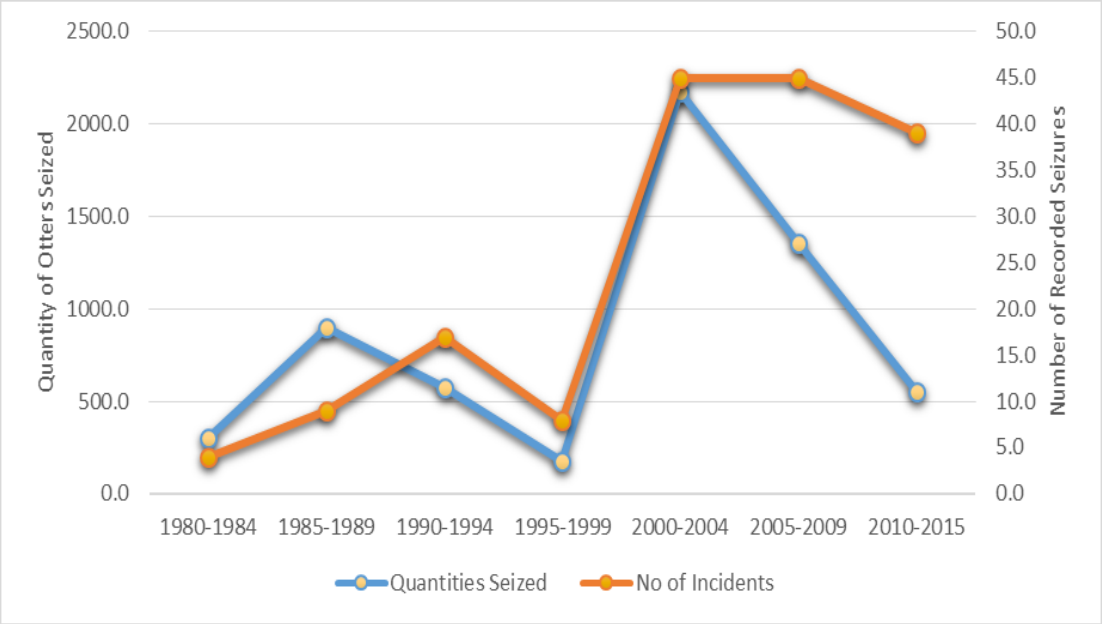


Figure 1: Total number of seizures recorded annually and quantities of otters seized.

A decline in the number of recorded otter skin seizures observed from 2005 onwards suggests waning trade levels (Figure 1). However, such a drop in seizure numbers may reflect weakened enforcement efforts and an increase in undetected trade. Similar lows in seizure data have occurred before, most notably between 1996 and 2000, after which seizure levels rose again, reaching a peak between 2003 and 2005. Furthermore, recent reports have shown the continuing extent of the trade in wild animal fur in the region (Verheij et al., 2010; Stoner and Pervushina, 2013). It is therefore too early to hint at a declining demand for otter furs. A more serious concern is that this decline in recent seizure records may be a sign of declining otter populations. The illegal otter trade has already been attributed as a key factor leading to the extinction of otters in parts of India (IOSF, 2014). The same has been reported for otter population in China where they were once widespread - demand for fur and live otters resulted in the near extirpation of the Eurasian Otter (Lau et al., 2010). Population levels of the species are still considered very low in southern China, and populations are thought to be present only in well protected areas (Lau et al., 2010). Poaching activities have also resulted in the depletion of otter populations in Myanmar where they have been hunted not just for their fur but also for their gall bladder and penis (Zaw et al., 2008).

The recent spike in illegal trade records of live animals suggests that the trade in otters for pets may now be increasing (Figure 2). The seizure data show that the number of live individuals in illegal trade has been on the rise since the 2000s particularly in Indonesia, Malaysia, Thailand and Viet Nam (Figure 3). However, the number of live otter seizures thus far remains relatively small. This may be an indication that the illegal otter pet trade mainly involves domestic markets. Of all the seizures involving live otters, there was only one incident where international trade was involved, i.e. the seizure of five small-clawed otters and six smooth-coated otter pups at Bangkok's Suvarnabhumi International Airport, reportedly headed for Japan's exotic pet market (Shepherd and Tansom, 2013). That said, it would be premature to conclude that there is no demand for pet otters. Indeed, CITES trade records show that a large part of the commercial international trade in otters concerned shipments of captive-bred live small-clawed otters.

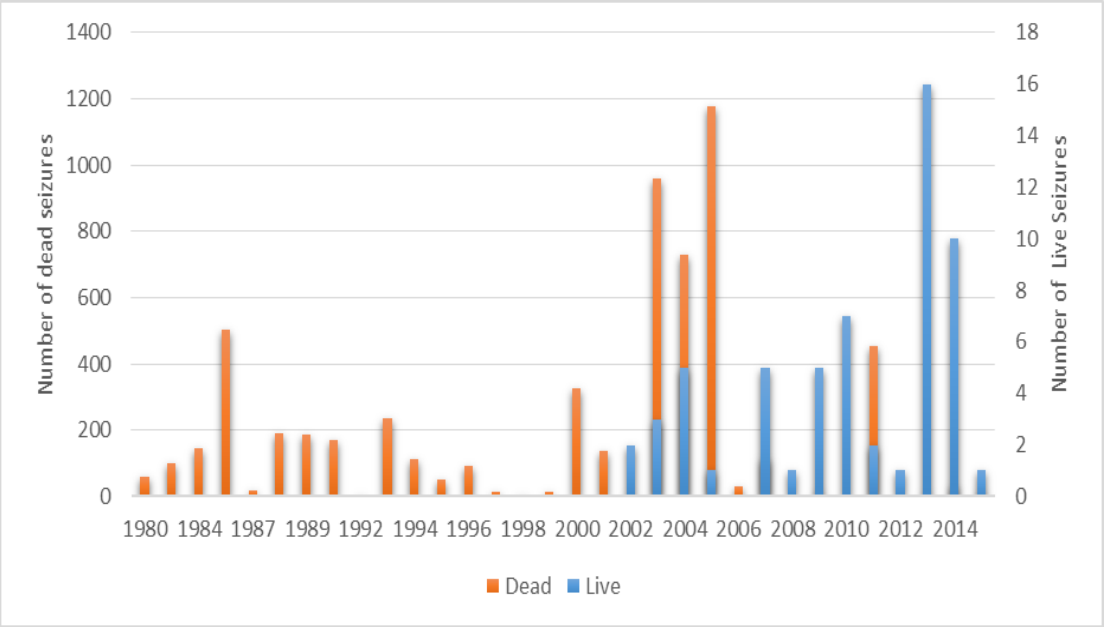
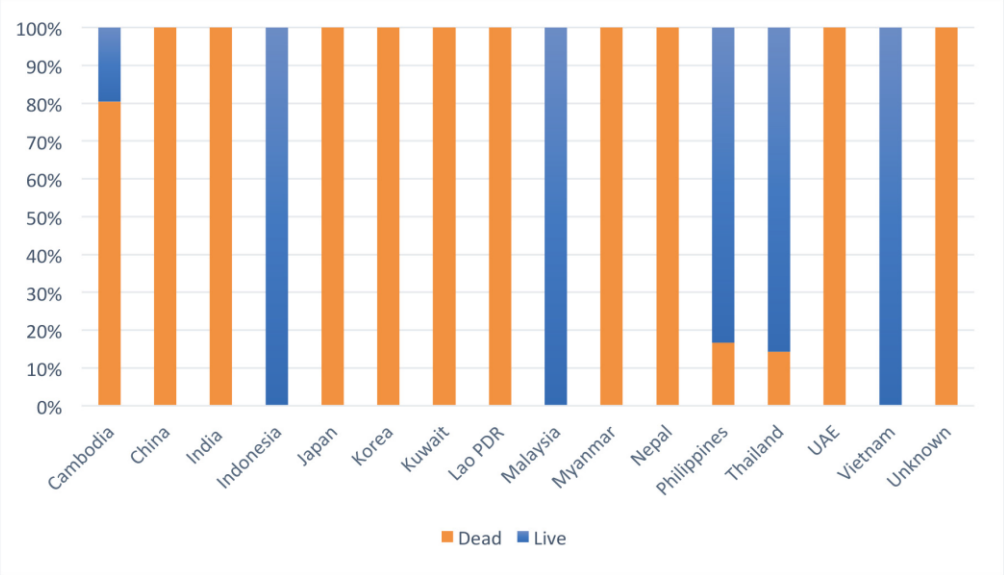


Figure 2: Number of dead vs live individuals seized per year.

There has also been a noticeable shift in the trade of wildlife from physical markets to online markets in recent years (Anon, 2014; Krishnasamy and Stoner, 2016). Preliminary scans of social media websites and trade fora have given us a glimpse of a flourishing online wild otter pet trade in Indonesia, Malaysia and Viet Nam. While actual transactions may only involve small numbers of otters, the frequency of such transactions appears to be high. A random glance at the online trade of otters in Viet Nam revealed at least 10 e-commerce websites and forums advertising otters as pets. In Viet Nam, as in Malaysia, otter seizures exclusively involved live individuals. In a recent assessment of the wildlife trade on Facebook in Peninsular Malaysia in the five months from November 2014 to April 2015, otters were highlighted as one of the most popular pet species in trade (Krishnasamy and Stoner, 2016). This was also found to be the case in Indonesia (Aadrean, 2013), and Brunei (Anon, 2014). The online illegal otter trade is likely to be substantial, and increasing, in both scale and scope. The lack of online otter trade records is perhaps the greatest gap in this study's dataset. To establish a more complete overview of the live otter trade, comprehensive assessments of the online trade are urgently needed to understand the scale and impact on wild populations and identify appropriate interventions to disrupt the trade.

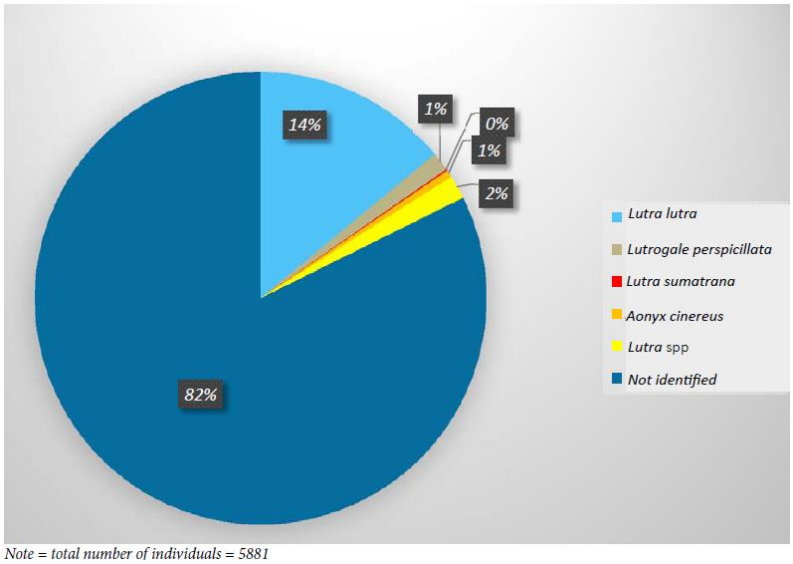


Note: dead = 5920 individuals; live = 59 individuals

Figure 3: Percentage of dead vs live individuals per country

Otter Species in Trade

Identification of Asian otters to a species level is difficult. It is exceptionally hard to distinguish between otter species, especially when dealing with skins and body parts. It is therefore unsurprising that 82% of seized otters in this study were not identified to the species level (Figure 4). Many of these were from seizures in India and China. This lack of information should be considered problematic and obstructive to conservation efforts for several reasons, the most important one being that whenever illegally traded otters remain unidentified, it becomes impossible for researchers to determine which otter species should be prioritized in conservation plans. In a similar vein, it becomes impossible to identify trends regarding the use of various species for different purposes and the demand for the different species in particular countries. Nevertheless, certain trends can be discerned from the individuals that were identified. All four Asian otter species assessed in this study were found in trade.



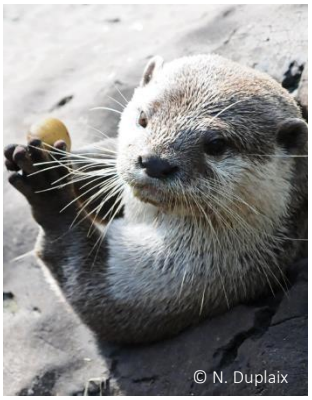
Note = total number of individuals = 5881

Figure 4: Seized otter species recorded.

Eurasian otters represented the highest number of identified individuals in seizure records (824 individuals; 87.6% of all identified individuals). This was mostly attributed to one large seizure of 778 skins in China in 2003. The skins originated in India and were in transit to the TAR along with 31 tiger skins and 581 leopard skins. No live Eurasian otters were encountered in any seizure records. Rather, recorded seizures of the species almost exclusively involved skins, confirming the species' popularity in the fur trade. Eurasian otters have the broadest habitat range of all otter species, which makes it difficult to establish any seized specimen's exact origin whenever such information is not recorded. Nevertheless, India and China's well-established fur trade means that these countries will continue to play an important role in the Eurasian otter trade.

The smooth-coated otter is also traded primarily for its fur. A large proportion of seizures of this species were skins and to a much lesser extent, carcass and tail. There were also several seizures of live individuals, reportedly destined for the pet trade. Many of the seizures were reported in Cambodia (70%), where this species is coveted by locals for use in traditional medicine (Poole, 2003). Such medicinal use includes otter skins used to assist women during pregnancy and childbirth. These practices may still occur in Cambodia, and the traditional medicine industry, and increasingly the pet trade, may pose significant threats to the smooth-coated otter and possibly even the endangered hairy-nosed otter, the only other otter species seized in that country.

The hairy-nosed otter was by far the least encountered species in trade records, with only six individuals seized between 2002 and 2008 in five separate incidents. This is not surprising as it is the rarest otter species in the region and has recently been rediscovered in Cambodia, Indonesia, Malaysia, Thailand and Viet Nam (Aadrean et al., 2015). All five seizure records for this species occurred in Cambodia. Of the six individuals seized, three were live and three were skins. It is impossible to draw any conclusions with regards to their trade and use with such a scarcity of seizure data. Nevertheless, given this species is already under severe pressure, any level of trade is likely to pose a significant risk to its survival.



Small-clawed otters are a popular species in the pet trade. CITES trade records show that nearly all legally traded small-clawed otters were live. More than half of all seizures reported for the species were of live individuals, albeit in small quantities (67.7%). These seizures occurred in Indonesia, Malaysia, Philippines, Thailand and Viet Nam. In India, the species is hunted for its fur and populations have reportedly been drastically reduced over the last decade (IOSF, 2014). There was one reported seizure of nine small-clawed otter skins in India in 2014.

CONCLUSION

This study was born out of a desire to understand the extent and scale of the illegal trade in four Asian otter species, in order to facilitate future research and action plans. However, there is a paucity of information on the illegal trade of otters in the Asian region. This is due to the fact that wildlife crime is still a low priority for governments and furthermore, otters are a low priority species for most conservation organizations. Seizure data were scarce for most countries assessed in this study with the exception of India. The real scale and scope of the Asian illegal trade in otters is therefore difficult to determine. The inherently secretive nature of the trade means that most illegal shipments go undetected. Additionally, the incompleteness of seizure data (due to poor enforcement and/or reporting) stands in the way of any conclusive measurement of the true extent of the issue. Wherever trade records are scarce, it is difficult to establish whether this is due to actual low trade levels or due to a lack of reporting.

Nevertheless, based on the seizure records acquired, it can be concluded that the illegal trade in otters is persistent and largely unchecked, even though the four Asian otter species receive a variety of legal protections across their range. While this study provides a preliminary understanding of the role of the illegal trade in endangering otter populations in parts of Asia, it also highlights the significant gaps in our knowledge that need to be addressed in order to mitigate these threats. First, the true extent of the trade remains unknown due to its inherently covert nature. Estimates in this report are likely to under-represent the magnitude of the trade. Second, little is known about the status of the four Asian species - uncertainty about population sizes, reproduction rates and in some cases distribution, makes it difficult to determine the resilience of each species in the face of exploitation. Third, in most seizure data, otters were not identified to the species level, which clearly poses an obstacle to estimating the impacts of the trade on the different otter species, and complicates the task of prioritizing species of concern for conservation action.

Further investigation is therefore urgently required to establish a more complete overview of the illegal otter trade in the region, including market and trade route surveys in key areas to identify trafficking hot spots and scale of the trade. Assessments of the online trade are also critically needed to better understand these new trading platforms and enhance protection of Asian otters. Underpinning the need to understand the illegal trade in otters is the need for research into the status of these four Asian otter species across their range so as to understand the impact of illegal trade on wild populations.

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RÉSUMÉ

COMMERCE ILLEGAL DE LOUTRES: UNE ANALYZE DES SAISIES DANS UNE SELECTION DE PAYS ASIATIQUES (1980-2015) - RESUME

Cette étude est une analyse des enregistrements des saisies de loutres par les organismes d'application de la loi dans une sélection de pays asiatiques entre 1980 et Juillet 2015. Cette étude fut menée pour comprendre l'étendu et l'échelle du commerce illégal des loutres en Asie, et fut ciblée sur 4 espèces de loutre asiatique qui sont la loutre d'europe (*Lutra lutra*), la loutre de sumatra (*Lutra sumatrana*), la loutre cendrée (*Aonyx cinereus*) et la loutre à pelage lisse (*Lutrogale perspicillata*). Ces 4 espèces ont été documentées dans le commerce illégale, avec 161 saisies de loutre enregistrées parmi 15 pays en Asie entre 1980 et 2015, impliquant une estimation de 5881 individus. La peau de loutre constitue la majorité des saisies, en particulier en Inde, au Népal et en Chine. Depuis le début des années 2000, il semble y avoir une hausse de la demande pour les jeunes loutres pour le commerce des animaux de compagnie, en particulier en Indonésie, Malaisie, Thaïlande et le Vietnam. Alors que l'enregistrement des saisies dans son ensemble étaient peu abondantes au sein de la région, nous concluons que le commerce illégal des loutres est persistant et largement non maitrisé en dépits du fait que ces espèces de loutre sont légalement protégées

RESUMEN

COMERCIO ILEGAL DE NUTRIAS: UN ANÁLISIS DE INCAUTACIONES EN PAÍSES ASIÁTICOS SELECCIONADOS (1980-2015) - RESUMEN

Este estudio es un análisis de los registros de incautación de nutrias por agencias de fiscalización y autoridades de aplicación en países Asiáticos seleccionados, entre 1980 y Julio de 2015. El estudio fue llevado a cabo para entender la extensión y escala del comercio ilegal de nutrias en Asia, y está focalizado en cuatro especies Asiáticas de nutria, la nutria Eurasiática (*Lutra lutra*), la nutria de Sumatra (*Lutra sumatrana*), la nutria de uñas pequeñas asiática (*Aonyx cinereus*) y la nutria lisa (*Lutrogale perspicillata*). Las cuatro especies fueron documentadas como apareciendo en el comercio ilegal, con 161 incautaciones registradas de nutrias, en 15 países en Asia entre 1980 y 2015, involucrando estimativamente 5.881 individuos. La mayoría de las incautaciones estuvieron constituidas por pieles, particularmente en India, Nepal y China. Desde principios de los 2000, parece haber una creciente demanda de crías de nutria para el comercio de mascotas, particularmente en Indonesia, Malasia, Tailandia y Viet Nam. Aunque los registros de incautaciones tomados como un todo fueron escasos a escala de toda la región, concluimos que el comercio ilegal de nutrias es persistente y en gran parte inadvertido o sin control, a pesar de que las especies de nutria están legalmente protegidas en toda su distribución.

OSG MEMBER NEWS

Since the last issue, we have welcomed 7 new members to the OSG: you can read more about them on the Members-Only pages.

Joanna Alfaro-Shigueto, Peru: In 1995, with colleague biologists, veterinarians and conservationists, we co-founded the non-profit group Pro Delphinus, a research organization that focused on marine conservation and small-scale fisheries, with a strong environmental education focus. In 2002, I was appointed as the Pro Delphinus President, extending the organization's work to other marine species including marine otters, seabirds and sharks.

Ninoslav Djurovic, Montenegro: I have been monitoring otters in Montenegro for the last seven years. Otters are not well known in this country, so I am working hard on educating the public, and getting agencies and ministries involved in making a plan for the protection and conservation of otters. I work in the National Park of Montenegro, and as well as surveying for otters, I teach visitors about otters and their importance. I am currently forming an NGO for otter conservation to raise the level of protection and explain the importance of the otter in Montenegro.

Lalita Gomez, Malaysia: I'm currently a programme officer with TRAFFIC based in Southeast Asia, looking at the illegal trade of wildlife in the SEA region. One of the species I focus on are otters, particularly the four Asian otter species. I first started working on otters in 2015 on a joint project between TRAFFIC and the IUCN OSG analysing otter seizure data in Asia between 1980 and 2015. The main aim of this project was to get a better understanding on what was driving trade of the four species found in Asia i.e. Small-clawed, Smooth-coated, Eurasian and Hairy-nosed otters.

Jeffrey Mangerl, Peru: I am a conservation biologist working at the Peruvian non-governmental organization ProDelphinus. I have been conducting research on the marine otter (*Lontra felina*) in Peru since 2003. This work has centered around understanding their distribution, activity patterns, foraging, and the threats they face related to human interactions (eg. habitat disturbance, fishery interactions, disease transfer).

Damián Pardo, Colombia: I am working on the genetic diversity of the neotropical river otter in Colombia, to contrast the population structure of this species in Colombia with that in Brazil and Mexico, to help with conservation strategies. I am co-found and senior researcher of the Otters Up Conservation Project in the Palmari Nature Reserve between Brazil, Colombia and Peru, implementing an adaptive management strategy for the sustainable use of aquatic resources to allow local communities to protect and conserve giant and neotropical river otters in the area.

Megan Stolen, USA: I have recently started work on a project in central Florida collecting data from road-kill otters, and also sightings information via a citizen Science "Otter Spotter" online form. I also give talks to increase awareness of otter biology and conservation.

Christina Wolf-Petre, Austria: I am a biologist with special focus in the field of (large) carnivores, amd am part of the WWF Austria Wildlife Conservation Team concentrating on 5 “conflict” species: lynx, wolf, beaver, otter and white tailed eagle. Because of my former experience in the field of wildlife conflicts, work on large predators, and WWF’s intensified work on otters, I have been appointed to lead the work on this species within the team.