R E P O R T

A SURVEY OF SMOOTH COATED OTTERS (*Lutrogale perspicillata sindica*) IN THE SINDH PROVINCE OF PAKISTAN

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ABSTRACT: The present report reveals the findings of surveys conducted jointly by Sindh Wildlife Department (SWD), Government of Sindh and WWF Pakistan, Islamabad (WWF-P) during November-December, 2008 and February 2009 with the objectives to confirm the existence of Smooth coated otter (*Lutrogale perspicillita sindica*) in different areas in Sindh and to identify various threats to otter population. An area of about 5,000 km was traversed covering 36 different sites in 12 districts of Sindh province where there were reports of otter existence. The existence of otter was confirmed at 25 sites in 11 districts. Evidence like recent otter tracks, remains of fish eaten by otter, otter spraints, and holts was gathered and local residents and fishermen were interviewed to verify the existence of otter at every site. Five sites located in four different districts were identified where an otter population exists throughout the year, whereas otters visited all the other sites occasionally over different seasons, in search of food. Various threats to the species identified during the surveys included hunting for fur, habitat degradation, water pollution, weak enforcement of wildlife laws, increasing tourism and competition and conflicts between otters and fishermen. The total population of Smooth coated otter was also estimated over the 25 sites as 178.

Keywords - Sindh otter, Indus eco-region, Sindh Wildlife Department, Indus for All Program

INTRODUCTION

Otter Conservation Project (OCP): The first phase of the Indus Eco-region Conservation Program of WWF-Pakistan, also known as the ***Indus for All Program***, has prioritized three threatened wildlife species; Marsh crocodile (*Crocodilus palustris*), Hog deer (*Axis porcinus*) and Smooth coated otter (*Lutrogale perspicillta*) as species of special concern, and intends to conserve these species in the Indus eco-region through their protection, habitat restoration, relocation and management with the help of local communities and the Sindh Wildlife Department (SWD). In this context, ***Indus for All Program*** has funded a two year (October 2008 to September 2010) Otter Conservation Project (OCP) for SWD via its Partnership Fund. This article is based on the findings of surveys conducted jointly by SWD and WWF-P, Islamabad under the OCP during November 23 to December 04, 2008 and February 12 to 21, 2009.

The Study Area: The study area is the Sindh province of Pakistan, comprising 23 districts, and is located in the southeastern part of Pakistan between latitudes N 23° and 28° and longitudes E 66° and 71°, covering an area of 140,914 km² (about 18% of the country's total land) and a population of 42.4 million (about 23 % of country's total population) (Government of Pakistan, 1998). It is bounded on its northwest by Baluchistan Province, on the northeast by Punjab Province, on the southern side by the Arabian Sea and towards the east by the Rajasthan and Gujrat states of India (Figure 1).

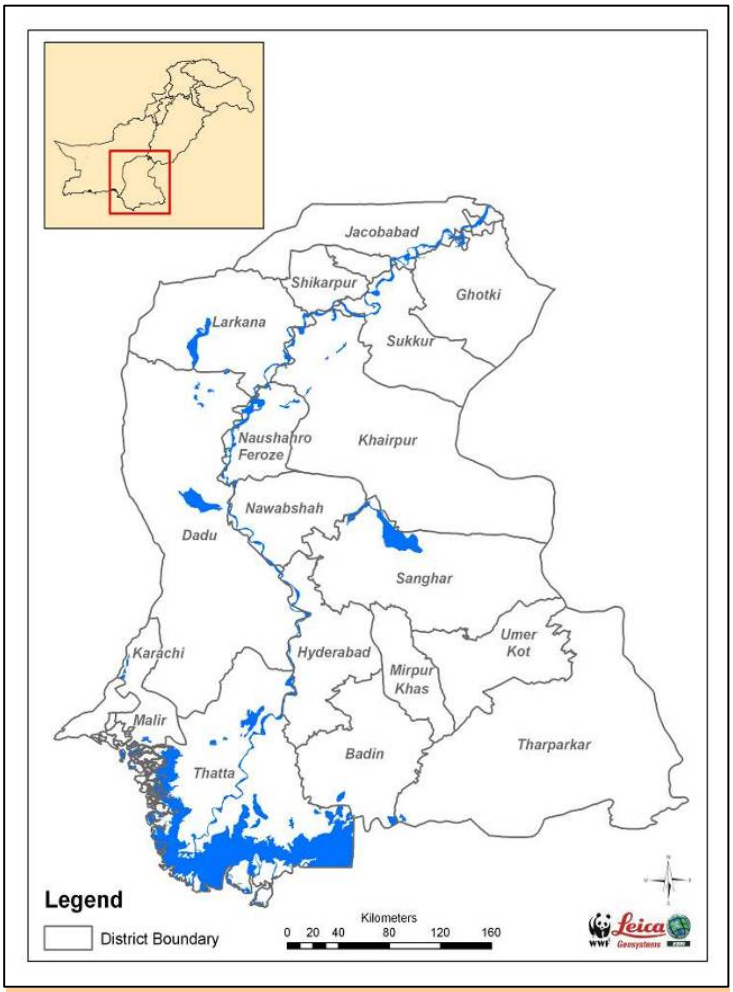

Fig. 1: Map of study area © WWF-P, Islamabad

Physiography: The study area represents four geophysical parts, with the Khirthar mountain range on its west; a central plain bifurcated by Indus River, a desert belt at its east and the Indus delta on its south. The Indus River is regarded as the lifeline and backbone of the economy for the Province, fulfilling the irrigation and drinking water requirements of the Province, thus playing an important role in regulating the economy of the country (Akbar, 2008).

Wetlands: In Sindh, there is a network of canals originating from three different barrages (Guddu, Sukkur and Kotri) on the Indus River. A large number of freshwater lakes and ponds of varying sizes are formed due to seepage of water along different canals and annual inundation of river water during the monsoon, and these provide suitable habitats for the Smooth coated otter (Akbar 2008).

Vegetation: Four types of distinct ecosystems exist in the study area, *i.e.*, tropical thorn forests, riverine, wetlands and coastal ecosystems (Akbar, 2008).

Wildlife: Sindh, having diversified habitat types, hosts a huge variety of amphibian, reptilian, avian and mammalian fauna. Key mammalian species include Asiatic Jackal (*Canis aureus*), Wolf (*Canis lupus*), Striped hyena (*Hyaena hyaena*), Caracal (*Felis caracal*), Smooth coated otter (*Lutrogale perspicillata*), Hog deer (*Axis porcinus*), Sindh ibex (*Capra aegagrus*), Chinkara (*Gazella bennettii*), Indus dolphin (*Platanista minor*) amongst others.

Otters: Pakistan is home to two species of otters: Smooth coated otter (*Lutrogale perspicillata*) and Eurasian otter (*Lutra lutra*). The Eurasian otter occurs in the northern mountainous region while the Smooth coated otter occurs in Sindh, Punjab and North West Frontier Province (NWFP) of Pakistan. The sub species found particularly along the Indus River has been referred as "Sindh otter" (*Lutrogale perspicillata sindica*) (Pocock, 1939). It is known as "Oodh Balao" and "Paani ki Billee" (water cat) in Urdu language, "Ludhro" (singular) and "Ludhra" (plural) in Sindhi language, "Luddhar" in Punjabi language and "Da Khwar Spay" (water dog) in Pushto language in NWFP.

Importance of the Smooth Coated Otter: Apart from its ecological role, the species has become a potential source of income for the local communities. An otter skin can fulfill the basic needs of a rural family for at least six months. Hundreds of nomadic people are involved in the illegal trade in wild animals and animal parts in the country; otter skin is amongst the highly priced wildlife products and fetches price ranging from Pak Rupees 30,000,- to 60,000,- (Khan et. al., 2008). This illegal practice, however, has put the otter population at risk.

Objectives of the study: The objectives of the study included determining the otter population and its distribution, identification of potential habitats and understanding the potential threats to the species in Sindh province.

REVIEW OF LITERATURE

Many studies have been conducted on otters in different countries of the world. However, in Pakistan only a few workers have dealt with the otters. Khan and Hasnain (2008) estimated the population of Smooth coated otter around Keti Shah riverine forest in Sukkur district and in a part of Nara canal lying within Sanghar district in Sindh. A detailed literature review on Smooth coated otter has also been conducted by Khan et al. (2008) that contains information about previous studies on Smooth coated otter in relation to its nomenclature, status, distribution and geographical range, biology, habitat, behavior and ecology, ecological role, food and feeding habits, breeding, territory size and threats. Gachal et al. (2007) studied the physio-chemical parameters of water samples from two different sites in River Indus representing the otter habitats and found them contaminated and not suitable for otter existence. Ellerman and Scot (1951), Ellerman (1961) and Prater (1965) have confirmed the occurrence of this species in Pakistan. Various authors (Siddiqui, 1969; Ahmad and Ghalib, 1975; Roberts, 1997, 2005) described otter in their published material while discussing mammalian fauna of Sindh province.

METHODOLOGY

The study area represents different types of habitats and terrains comprising semi desert plains, cultivated lands, wild lands, river, barrages, canals, lakes, ponds and fish farms etc. Therefore, different direct and indirect methods were applied to find out the potential sites of the occurrence in the study area.

Apart from gathering secondary information from published and unpublished reports about populations and distribution of otters in the study area, relevant people in different areas including the officials of SWD, WWF-P, Fisheries and Irrigation Departments, Fisher Folk Forum, local hunters, local fishermen, fish farmers, fish traders, boatmen and some political and influential people were contacted to obtain their views about existence of the otters in study area. Fish markets in different districts where the fishermen daily gather to sell their catch were also visited in order to listen to different fishermen and fish traders and to gather some information about the existence of the otter and problems for fishermen related to the otters.

According to the information obtained through all the sources, 12 districts containing potential otter habitats were marked on a district map of the Sindh Province. Almost every possible potential otter site was visited for the confirmation of otter existence. Recent otter tracks, remains of eaten fish by otter, otter spraints and holts were the means to confirm the existence of otters. GPS coordinates at every site were recorded to develop the population distribution maps. Photographs of otter tracks, remains of eaten fish by otter, otter spraints and otter habitats were also taken.

During the survey, an attempt was also made to estimate the existing population of Smooth coated otter in the study area. This population estimation was made by using Tracks Count Technique (Brower et. al., 1990) at five sites (site No. 3, 4, 5, 13 and 14; table 3) while at rest of the 20 sites, the estimates were based only on interviews with locals, fishermen, fish farmers and hunters.

Equipment and field kits used during the surveys included Digital camera (Canon EOS 30 D), search lights, measuring tape, binoculars (10 x 50), GPS (Garmin Map 76) and field guide books.

RESULTS

An area of about 5,000 km was traversed in 12 districts of Sindh. A total of 36 sites were visited to record the existence of otter, of which 25 sites in 11 districts were positive (Table 1).

Table 1: Sites where otter existence was confirmed during the survey

Sr. No.	Site	District	GPS Coordinates	Habitat Description
1	Guddu Barrage	Kashmore	N 28º 23' .796" E 69º 44' .574"	Thickly vegetated banks with *Typha, Saccharum* etc.
2	Summanu Lake	Ghotki	N 28º 23' .748" E 69º 43' .869"	Thickly vegetated banks with *Typha, Saccharum.*
3	Keti Shah	Sukkur	N 27º 46' .299" E 68º 55' .442"	River banks with *Tamarix, Saccharum, Phragmites*
4	Keti Shah	Sukkur	N 27º 48' .068" E 68º 54' .054"	River banks with *Tamarix, Saccharum, Phragmites*
5	Keti Shah	Sukkur	N 27º 46' .785" E 68º 55' .183"	River banks with *Tamarix sp., Saccharum, Phragmites*
6	Hummal Lake	Qambar Shahdadkot	N 27º 41' .159" E 68º 51' .166"	Sparse *Typha* growths in patches in the lake
7	Hummal Lake	Qambar Shahdadkot	N 26º 49' .267" E 67º 39' .388"	Sparse *Typha* growth in patches at small islands in the lake
8	Nara Canal	Khairpur	N 26º 27' .097" E 68º 54' .113"	Banks covered with thick vegetation, Mesquite etc.
9	Jamrao Headwork	Nawab Shah	N 26º 56' .005" E 68º 58' .327"	Mesquite, *Saccharum*, *Typha* etc. along banks
10	Baqar Lake	Sanghar	N 26º 50' .744" E 68º 47' .399"	Sand dunes along one side and vegetation; *Typha*, *Saccharum* etc. along the other sides
11	Dhalor Mori	Sanghar	N 25º 05' .570" E 69º 09' .531"	Fish farms surrounded by thick vegetation of *Typha*, *Saccharum* etc.
12	Khipro Canal	Sanghar	N 26º 06' .103" E 69º 00' .926"	Canal banks covered by thick vegetation of *Typha*, *Saccharum* etc.
13	Nara Canal	Sanghar	N 26º 07' .049" E 69º 00' .790"	Canal banks covered by *Typha*, *Saccharum*, Masquite, etc.
14	Goath Leghari	Sanghar	N 26º 09' .275" E 68º 59' .470"	Agricultural fields and *Typha* and *Saccharum* along water bodies
15	Chotiari Reservoir	Sanghar	N 26º 12' .313" E 68º 59' .571"	Thick vegetation of *Typha*, *Saccharum*, Mesquite, etc.
16	Usman Ibopoto	Sanghar	N 26º 13' .617" E 69º 02' .206"	Agricultural fields and *Typha* and *Saccharum* along water bodies
17	Power House	Sanghar	N 26º 24' .412" E 68º 52' .766"	Agricultural fields and *Typha* and *Saccharum* along water bodies
18	Manchhar Lake	Jamshoro	N 26º 25' .097" E 67º 39' .113"	Sparse *Typha* growths in patches at small islands in the lake
19	Talar village	Badin	N 24º 46' .244" E 68º 56' .414"	Agricultural fields, *Saccharum* and *Typha* along ponds at wild lands
20	Mirpur Sakro	Thatta	N 24º 35' .349" E 67º 44' .668"	Agricultural fields, *Saccharum* and *Typha* along ponds at wild lands
21	Mirpur Sakro	Thatta	N 24º 35' .855" E 67º 44' .023"	Agricultural fields, *Saccharum* and *Typha* along ponds at wild lands

22	Haleji Lake	Thatta	N 24º 47' .212" E 67º 45' .947"	Thick vegetation, *Typha*, Masquite *Saccharum* etc. around the lake
23	KDA Branch Canal Chilya	Thatta	N 24º 48' .017" E 67º 58' .860"	Canal banks covered by thick vegetation of *Typha*, *Saccharum* etc
24	Keenjhar Lake	Thatta	N 25º 01' 254" E 68º 01' 215"	Thick vegetation, *Typha*, Mesquite *Saccharum* etc. around the lake
25	Jamrau canal	Mirpur Khas	N 25º 35' 33.8" E 69º 04' 40.4"	Canal banks covered by *Typha*, *Saccharum*, Mesquite etc.

Historical Distribution of Smooth coated otter in Sindh

Based on the available literature and personal communication with biologists, the historical distribution of Smooth coated otters in Sindh Province was plotted on a map (Figure. 2). The wildlife conservation movement started in Pakistan during early 1970's after the report about the WWF expedition to Pakistan (Mountfort and Poore, 1968) and the Wildlife Enquiry Committee Report under the Ministry of Agriculture and Works (Government of Pakistan, 1971). Results of the research conducted prior to this conservation movement in the country have been considered as historical data for plotting the distribution of the Smooth coated otters in the study area. According to these records, Smooth coated otters existed along the River Indus throughout the Sindh Province (Blanford, 1881; Murray, 1884) and in upper Sindh, lower Indus valley and eastern Nara (Pocock, 1939). According to Mountfort (1969) and WWF (1967) the Smooth coated otters existed in the Indus River in West Pakistan. Roberts (1977 revised edition in 1997) reported the existence of the species at Keti Bunder, Sindh coast, Sundari Lake and east Nara swamps and described its range beyond the lower Indus.

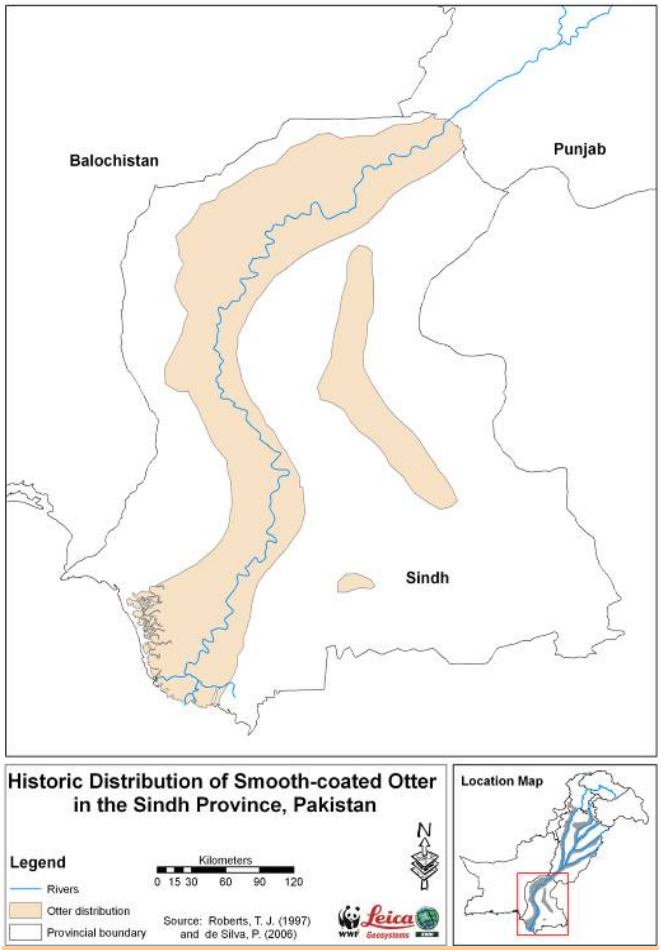

Fig. 2: Historical distribution of Smooth coated otter in Sindh © GIS Lab, WWF Pakistan

Current Distribution of the Smooth coated otter in Sindh

Thirty-six sites in 12 districts in the study area were searched for evidence of the Smooth coated otter, and its existence was confirmed at 25 sites in 11 districts (Table 1; Fig. 3).

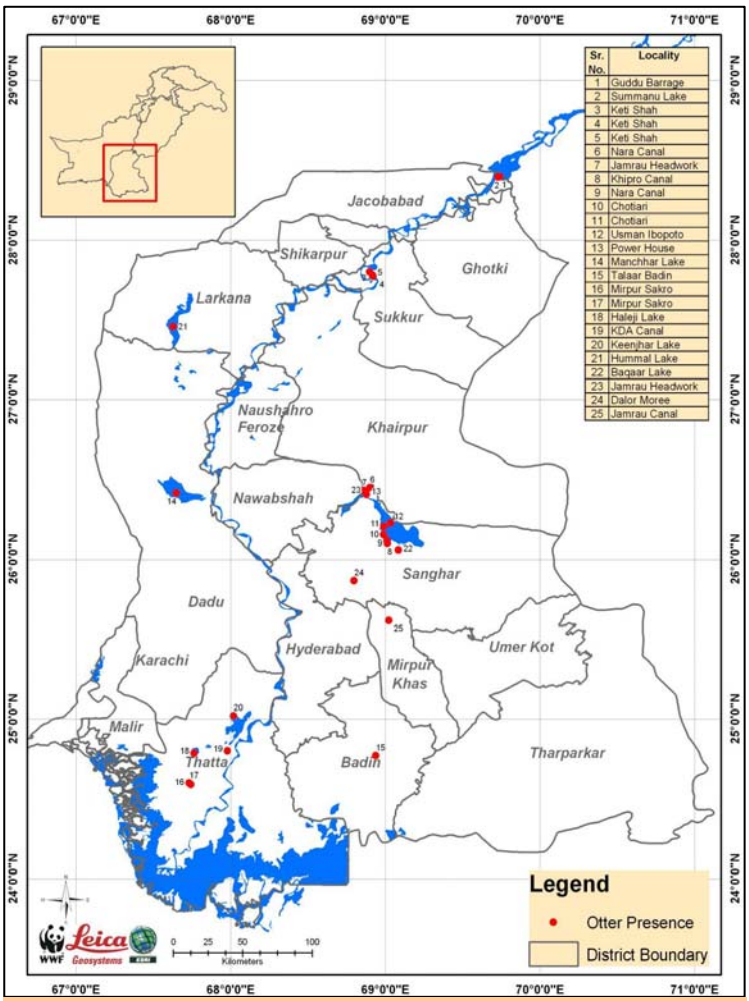

Fig. 3: Current distribution of Smooth coated otter in Sindh © GIS Lab, WWF Pakistan

Observation Records of Otter

Only at one site (out of the 25) near the Power Hose in Chotiari Wetlands Complex (site No. 17), was the otter observed directly; a female with six newly born cubs (Fig. 6). At the rest of the 24 sites, the existence of otters was confirmed on the basis of indirect evidence such as tracks, spraints, holts, remains of eaten fish by otter and interviews with locals, fishermen and fish farmers (Table 2; Fig 4 and 5).

Estimated Otter Population

The population of smooth coated otter was estimated around 178 (152 to 204) at all the sites where there were evidences of otter existence (Table 2). These estimates are

based on Track Count Method at five sites (site No. 3, 4, 5, 13 and 14) while at the rest of 20 sites these depended on interviews.

Fig. 4: Otter spraint in Chotiari, Sanghar © WWF-P, Islamabad

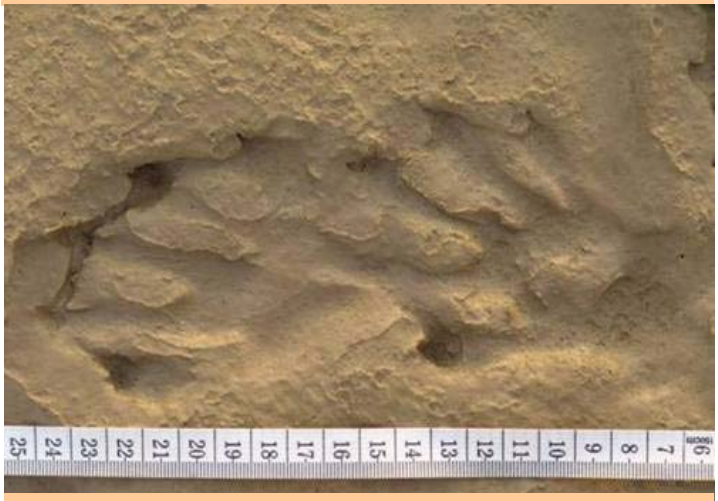

Fig 5: Otter tracks along Nara canal, Sanghar © WWF-P, Islamabad

Fig. 6: Six otter cubs near Power House, Chotiari © Indus for All Programme

Table 2: Observation records and estimated numbers of otters

Sr. No.	Location	Estimated Otter Population	Direct Obser-vation	Indirect Observations				
				Otter Holts	foot print	spraint signs	eaten fish	interview
1	Gudu Barrage	**10 - 12**	-	-	-	√	-	√
2	Sumanu Lake	**10 - 12**	-	-	√	-	-	√
3	Keti Shah	**6**	-	-	√	-	-	√
4	Keti Shah	**4**	-	-	√	-	-	√
5	Keti Shah	**2**	-	-	√	-	-	√
6	Hummal Lake	**4 - 6**	-	-	-	-	-	√
7	Hummal Lake	**6 - 8**	-	-	-	-	-	√
8	Nara Canal	**8 - 10**	-	-	√	-	-	√
9	Head Jamrau	**10 - 16**	-	√	√	-	-	√
10	Baqar Lake	**4 - 6**	-	-	√	-	-	√
11	Dhalor Mori	4 - 6	-	-	√	-	-	√
12	Khipro Canal	**4 - 6**	-	-	-	-	-	√
13	Nara Canal	**8**	-	-	√	-	-	√
14	Goth Leghari	**8**	-	-	√	-	-	√
15	Chotiari	**2 - 4**	-	-	√	√	-	√
16	Ibopoto	**2 - 4**	-	-	√	-	-	√
17	Power House	**8 - 10**	√	-	√	√	-	√
18	Manchar lake	**4 - 6**	-	-	-	-	-	√
19	Talaar	**6 - 8**	-	-	√	-	√	√
20	Mirpur Sakro	**4 - 6**	-	-	√	-	-	√
21	Mirpur Sakro	**4 - 6**	-	-	√	-	-	√
22	Haleji Lake	**12 - 18**	-	-	√	√	-	√
23	KDA Branch	**6 - 8**	-	-	√	-	-	√
24	Keenjhar lake	**4 - 6**	-	-	√	-	-	√
25	Jamrau canal	**12 - 18**	-	-	√	-	-	√
Total Population		**152 - 204**	**178 animals in the study area**					

Potential Otter Sites

Criteria were developed to identify the potential otter sites in the study area as follows.

- Whether otters occur at the site throughout the year
- Whether the site offers a potential and healthy habitat to otters
- Whether adequate food is available
- The level of human disturbance at the site
- Whether the habitat provides suitable breeding sites
- Whether the area is easily accessible

Using these the selection criteria, out of the 25 sites, five (Nos. 1, 8, 13, 15 and 22) in four districts were identified as the potential sites (Table 3).

Table 3: Potential otter sites identified during the reconnaissance survey

Sr. No.	Site	District	GPS Coordinates
1	Guddu Barrage	Ghotki	N 28º 23’ .796” E 69º 44’ .574”
2	Nara Canal	Khairpur	N 26º 27’ .097” E 68º 54’ .113”
3	Nara Canal	Sanghar	N 26º 07’ .049” E 69º 00’ .790”
4	Power House, Chotiari	Sanghar	N 26º 12’ .313” E 68º 59’ .571”
5	Haleji Lake	Thatta	N 24º 47’ .212” E 67º 45’ .947”

Conservation Status of Smooth coated otter

The Smooth coated otter is categorized as Near Threatened (IUCN Red List of Pakistan Mammals, 2005). Although it is protected (P) in Sindh under Sindh Wildlife Protection Ordinance 1972 and enlisted in Appendix II of the CITES Category 2007, the otter is considered to be on the decline due to habitat fragmentation, conflicts with fishermen and hunting for its pelt (Roberts, 1997; Gachal et al., 2007). Due to high levels of pollution in Hummal and Manchhar Lakes, the otter has almost disappeared from these two large lakes. The case of Keenjhar Lake is somewhat different, where increased human activities as a result of ill-planned tourism and over-fishing have forced the otters to leave. In Keenjhar Lake, the otter is still found and one animal was found dead in May 2008 on the nearby road, killed by a vehicle. In Chotiari Wetlands Complex, *Typha* cutting and burning of the undergrowth are the major factors that force the resident otter populations to move locally.

THREATS TO SMOOTH COATED OTTER IN SINDH

Major threats to Smooth coated otter identified during the study are discussed below:

Otter Hunting for Fur Trade

A nomadic tribe named differently in different areas in the country (Baagree, Oadh, Pakhee Waas, Changar), and working under the shelter and protection of some resourceful people and wildlife products dealers and traders, is the major culprit in otter skin trade (Fig. 7 and 8). More than 400 well-trained hunters belonging to this tribe are actively hunting wild animals in the country. According to the hunters there are two types of otters, a white and a dark one. The hunters are paid by the dealers or middlemen Rs. 12,000 to 15,000 (US $ 150 to 180) for the dark skin and Rs. 25,000 to 30,000 (US $ 312 to 375) for the white skin, whereas the middlemen earn from the traders Rs. 30,000 (US $ 375) for the dark skin and Rs. 60,000 (US $ 750) for the white skin. Unfortunately, no white skin was available.

Fig. 7: Settlement of nomadic tribe near Sanghar © WWF-P, Islamabad

Fig. 8: Settlement of nomadic tribe near Sanghar © WWF-P, Islamabad

Habitat Degradation

The otter, being an amphibious animal, utilizes both water and land environments for its various activities and hence, both water and land collectively constitute its habitat. The aquatic part provides food, while the terrestrial part provides necessary shelter and refuge to the animal. Unfortunately, in the study both aquatic and terrestrial habitats of otter have seriously deteriorated because of:

i. Water Pollution

Manchhar Lake is the largest freshwater body in South Asia covering an area of 233 km2. Since 1982, the Right Bank Outfall Drain (RBOD), stretching over 111 km, is dumping the sewage, waste water and industrial effluents into the lake from six different towns and cities located on the right bank of the River Indus and to the north of the lake. This practice has severely damaged the water quality and associated biodiversity, and has affected the livelihood of over 50,000 people. The level of pollution in the lake can be assessed by the fact that the annual fish catch from the lake is now less than 100 tons, whilst it was 300 tons in 1994 and 3,000 tons in 1950 (Mustafa 2008). Under such environmental conditions, it is hard for the otter to survive where it was once found in abundance. The case is similar for the Hummal Lake, as the two lakes are connected.

ii. Clearing of Vegetation

Otter habitats in most of the study area consist mostly of *Typha sp.* along with *Phragmites* and *Saccharum sp.* These three plant species provide refuge, shelter and the breeding grounds to the species. *Typha sp.*, which is around 70% of the vegetation in most of the otter habitats in the study area, is cut for various purposes by the locals and nomads (Fig. 9). Mostly it is used for making mats to cover the roofs of temporary houses (Fig. 10 and 11). *Typha* from an area of almost 2.5m^2 is required for making one mat measuring 2.5 x 5.5 m. A single person can make four such mats in a day. These people are paid Rs. 50 (US $ 0.63) for one mat and hundreds of such mats are made weekly and sold in nearby towns. Annual *Typha* cutting forces the otters to move and look for some other refuge at least during *Typha* harvesting, and thus it poses a serious threat to its resident population.

Fig. 9: Cutting of *Typha* from otter habitat © WWF-P, Islamabad

Fig. 10: Making of sheets from *Typha* © WWF-P, Islamabad

Fig. 11: Piled up sheets of Typha
© WWF-P, Islamabad

Weak Enforcement of Wildlife Laws

The decline in otter populations even in the presence of Sindh Wildlife Protection Ordinance 1972 suggests that the protection is not effective and there are gaps in the implementation of the wildlife laws (Shafiq, 2005). Poor law enforcement due for various reasons like lack of trained staff and funds is also contributing to the otter decline in the study area.

Burning of Undergrowth

Thick vegetation of Mesquite (*Prosopis juliflora*) in Chotiari Wetlands Complex is burnt dried annually by the local communities to have fuel wood as well as fresh grasses for their livestock (Fig. 12). These fires in otter habitat not only disturb the fauna of the area but also remove the refuge and shelter of the otter and force it to move to other areas at least for a short period of two to three months during the year.

Fig. 12: Burning of undergrowth
© WWF-P, Islamabad

Presence of hunting and feral dogs

Hunting and feral dogs in the study area especially around Keenjhar Lake are a threat to otters especially the cubs.

Tourism

Thousands of tourists from Karachi, Hyderabad, Thatta and other cities visit Keenjhar and Haleji Lakes on weekly basis, and otter populations have been greatly affected at these two sites. According to the locals, about six to eight year back, the otter was commonly found around Keenjhar Lake but now it is difficult to locate. Dumping of polythene bags, plastic bottles, glass bulbs and other non-degradable wastes are some of the negative impacts associated with the tourism that affect the habitat quality.

Keenjhar Lake, covering an area of 9,842 ha (98.42 km^2), is a good income resource for fisherman of Thatta district where 10,766 fishermen with 1,205 boats are actively involved in fishing. The total annual fish catch from the lake has been reduced from 194,861kg in 2001-02 to 27,351 kg in 2004-05 (*Indus for All Program*, 2006). These figures reflect the over-exploitation of the fisheries resources in the lake. Such anthropogenic activities encompassing over 10,000 fishermen and thousands of tourists at the lake on daily basis has adversely affected the otter population.

Human-Otter Conflicts

Many fish farmers and locals consider otters as pest and try to kill them whenever they get a chance. There are some reports of huge damage to fish stocks in fishponds and many fish farmers have closed their fish farms due to otters' attacks on the fish stocks in their fish farms. Similarly, *Typha* and *Saccharum sp.* constituting the major part of otter habitat also provide a source of livelihood for the local communities in the study area. Therefore, upon utilization of common resources by both otters and human, there is serious conflict between the two.

Competition for Food

Fish provides food for both human and otters. There are hundreds of small and large freshwater lakes in the study area, and many fish farms in the area. People have also converted many of these natural freshwater lakes into fish farms. Human occupancy on natural wetlands has also created a difficult situation for otters who rely on natural wetlands for food, and they have either to forage far away or to attack the fish farms. Thus, otters in the study area do not have permanent refuge, feeding and breeding grounds and have to move seasonally, which constitutes a continuous disturbance for otters.

Otter attacks on Humans

The otter is considered a dangerous animal among the locals. There are many examples of otter attacks on humans in the study area, but all such attacks by otters were found to be in self-defense.

DISCUSSION

There are very few and insufficient data available from literature to compare the past and present status of Smooth coated otter in the study area, but after interviewing a number of people from all the 25 sites in the study area where the existence of otter was confirmed during the survey, it was found that the otter population is facing a decline. The main reasons for this are poor the economic condition of local communities, unemployment and lack of awareness about otters and to some extent, fish farming. High demand of otter skin in China and Tibet (IOSF 2008) and its high price (Khan et al., 2008) in the study area, and low risk for the hunters due to weak enforcement of wildlife laws, have encouraged otter hunting by the poor local communities.

Once existing in vast areas almost all along Indus River and irrigation system in Sindh (Roberts, 1997; Khan and Husnain, 2008), Smooth coated otters have been compelled now to live in scattered populations in fragmented habitats, and to keep moving for survival in the study area, due to habitat destruction through vegetation removal, water pollution and planned annual forest fires, over-hunting, lack of awareness and continuous and regular human intrusions/disturbances in otter habitats. Only five sites in the study area, out of 25 during the survey, were found to be the potential sites of the Smooth coated otter where it could be found through out the year, while rest of the 20 sites of otter existence were those visited by otters occasionally in different seasons. Despite all this, some of the local fishermen consider otter's presence as a blessing as they get more fish trapped in their nets due to otter activity. Fishermen that used to keep otters as pets and as assistants for fishing in the past revealed that otter is a very intelligent and loyal animal and can be tamed in a short period of time.

Breeding by Smooth coated otters and birth of the cubs may occur at any time throughout the year (Roberts, 1997; Foster-Turley, 1992). Litter size of 2 to 4 cubs is normal (Roberts, 1997), but during the survey six cubs were found with a mother at Chotiari Wetlands Complex in Sanghar District. According to fishermen and some hunters, six otter cubs per pregnancy are a common phenomenon.

The Baagree Tribe is playing a key role in the decline of Smooth coated otter. It is very unfortunate that hunting habits actively contribute to threaten the wildlife in the country even in the presence of wildlife protection laws.

CONCLUSION

The Smooth coated otter is an important ecological indicator of a healthy wetland and associated biodiversity, especially the fish fauna. Once distributed widely throughout Sindh, it exists in fragmented habitats in isolated populations now. If threats and stresses continue to exist, it will vanish. Hence, it is mandatory to conserve this species through restoration of its habitats, minimizing the threats and its relocation from sensitive to protected habitats.

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RESUME

UNE ENQUETE SUR LA LOUTRE A PELAGE LISSE (*Lutrogale perspicillata sindica*) DANS LA PROVINCE DE SINDH, PAKISTAN.

Ce rapport révèle les conclusions d'enquêtes de terrain accomplies conjointement par le Département de la Faune Sauvage de la province de Sindh (SWD), le Gouvernement de Sindh et le WWF Pakistan basé à Islamabad (WWF-P) entre novembre-décembre 2008 et février 2009. Les objectifs étaient de confirmer l'existence de la Loutre à pelage lisse (*Lutrogale perspicillata sindica*) dans différentes régions de Sindh et d'identifier les menaces pesant sur la population. Une région d'environ 5000 km a été prospectée couvrant 36 sites dans 12 districts de la province où la Loutre y était déjà mentionnée. La présence de l'espèce a été confirmée sur 25 sites pour 11 districts. Les preuves récentes de présence comme les empreintes, les restes de poissons, les épreintes et les catiches ont été collectées. De plus, les résidents locaux ainsi que les pêcheurs ont été sondés afin de confirmer l'existence de la Loutre sur chacun des sites. Cinq sites positifs dans quatre districts différents présentent une population régulière tout au long de l'année alors que les autres sites positifs ne sont fréquentés qu'occasionnellement en fonction des saisons notamment pour la recherche de nourriture. De nombreuses menaces pesant sur l'espèce ont été identifiées durant l'enquête: la chasse pour le pelage, la dégradation des habitats, la pollution de l'eau, la faible application des lois de conservation de la faune sauvage, l'augmentation du tourisme et enfin la compétition ou les conflits entre loutres et pêcheurs.

Sur ces 25 sites, la population totale de Loutre à pelage lisse a été estimée à 178 individus.

RESUMEN

RELEVAMIENTO DE NUTRIA DE RÍO DE EPELAJE SUAVE (*Lutrogale perspicillata sindica*) EN SINDH, PROVINCIA DE PAKISTÁN.

El presente reporte revela los hallazgos de relevamientos conducidos en conjunto por el Departamento de Vida Silvestre de Sindh (SWD), el gobierno de Sindh y el Fondo para la Vida Silvestre Mundial Pakistan, Islamabad (WWF-P) durante noviembre-diciembre del año 2008 y febrero del 2009 con los objetivos de confirmar la existencia de nutria de río de pelaje sueve (*Lutrogale perspicillata sindica*) en diferentes áreas de Sindh y para identificar varias amenazas para la población de nutrias de río. Un área de 5.000 km^2 fue recorrida cubriendo 36 sitios diferentes en 12 distritos de la provincia de Sindh donde la existencia de nutria de río fue reportada. La presencia de nutria de río fue confirmada en 25 sitios en 11 distritos. Evidencias como huellas recientes de nutria de río, restos de peces recientemente consumidos, feces, y madrigueras fueron collectadas y residentes locales y persadores fueron entrevistados para verificar la existencia de nutrias de río en cada sitio. Cinco sitios localizados en cuatro distritos diferentes fueron identificados donde poblaciones de nutria de río estivieron presentes a lo largo del año, los otros sitios fueron visitados por nutrias de río ocacionalmente durante diferentes estaciones, en búsqueda de comida. Amenazas para la especie identificadas durante los relevamientos fueron cacería por la piel, degradación de hábitat, polución de agua, falta de implementación de leyes de vida silvestre, incremento del turismo y competición y conflictos entre nutria de río y pescadores. Una población total estimada de nutria de río de pelaje suave de 178 individuos fue estimada para los 25 sitios.