A Survey of Smooth-Coated Otter (Lutrogale Perspicillata Sindica) and Fishing Cat (Prionailurus Viverrinus) in Chotiari Reservoir, Sanghar, Pakistan Using Camera Traps

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A SURVEY OF SMOOTH-COATED OTTER (*LUTROGALE PERSPICILLATA SINDICA*) AND FISHING CAT (*PRIONAILURUS VIVERRINUS*) IN CHOTIARI RESERVOIR, SANGHAR, PAKISTAN USING CAMERA TRAPS

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ABSTRACT

Chotiari Reservoir located in District Sanghar, Sindh, Pakistan is known for its high biodiversity. Several threatened species of animals and plants including smooth coated otter (*Lutrogale perspicillata sindica*) and fishing cat (*Prionailurus viverrinus*) are known to abound this wetland. A survey for authenticating the presence and active nesting sites of smooth coated otter and fishing cat was conducted during 2012. Two of the four installed camera traps have captured photos of fishing cat whereas two cameras were successful in photographing a family of smooth-coated otter composed of five individuals. The survey confirmed the presence of two species which otherwise considered to be rare or locally extinct.

Keywords: Camera trapping, Chotiari Reservoir, Smooth-coated otter, *Lutrogale perspicillata sindica*, Fishing cat, *Prionailurus viverrinus*.

INTRODUCTION

Chotiari Reservoirs which is located in District Sanghar, Sindh, is considered as a favorable habitat for a variety of mammals including 14 large and 24 small mammals (Khan and Hasnain, 2008). A number of these mammals were not sighted directly but their presence was recorded on information provided by locals or scanty scientific clues (Rais *et al.*, 2010, 2011). Information about some of these mammals such as smooth-coated otter (*Lutrogale perspicillata sindica*) and fishing cat (*Prionailurus viverrinus*) is based entirely on hearsay and accounts of the locals (Rais *et al.*, 2009). The presences of these species have also been reported from various parts of Pakistan including Chotiari Reservoir by Khan *et al.*, (2010, 2013) through indirect records. Rais *et al.*, (2009) carried out study on the population of smooth-coated otter in Sindh province and reported the confirmed presence of only few individuals. They observed six healthy cubs of smooth-coated otter at Chotiari Reservoir which is the only confirmed proof of this species in the area. The remaining information about this species was based on indirect evidence such as foot prints whereas no adult was observed by them.

There are no two opinions that some mammal and reptile species are very hard to observe due to their shy and nocturnal habits. Although methods of animal counting, assessment and monitoring using foot prints, calls, burrows, colonies, food remains and scats observations were previously being used, however, emerging new technologies such as camera trapping, satellite monitoring systems etc. are gaining popularity in animal research (Karanth and Nichols, 1998; Kucera and Barrett, 1993; Mace *et al.*, 1994; Silveira *et al.*, 2003; Jenks, 2011). Camera trap technologies are used especially in those areas that hard to access due to dense forests, vegetation cover where live trapping, sighting or even indirect sighting methods could not be used (Mohd-Azlan and Lading, 2006; Bernard *et al.*, 2013). In Chotiari Reservoir, no previous record of camera trapping is available for verification and population assessment of any animal.

In order to authenticate the presence and record any behavioral aspects of smooth-coated otter and fishing cat camera trapping was used. The present paper reports the results of the camera trapping made in 2012.

MATERIAL AND METHODS

Study Site

Sanghar District has large complex of brackish and freshwater wetlands comprised of small ponds, large lakes, irrigation canals, storage reservoirs (Rais *et al.*, 2008). It is a semi-natural reservoir having a complex of terrestrial and aquatic ecosystems of freshwater, brackish lakes and shallow marshes having patches of riverine forests, agriculture lands, and sand dunes in North known as “Achro Thar” (Khan and Hasnain, 2008). The historical Nara Canal covers its north eastern and eastern boundaries.

The reservoir is spread over 13 kilometers wide and 16 km long area and occupies an area of about 64,000 acres with water storage capacity of about 0.71 million acre feet. Complex of Chotiari Lakes was flanked by a rich flora of

riverine forest along the embankment of Nara river course (Fig.1). This reservoir is known to have rich mammal population including smooth-coated otter and fishing cat but no sighting of these animals is reported from the area.

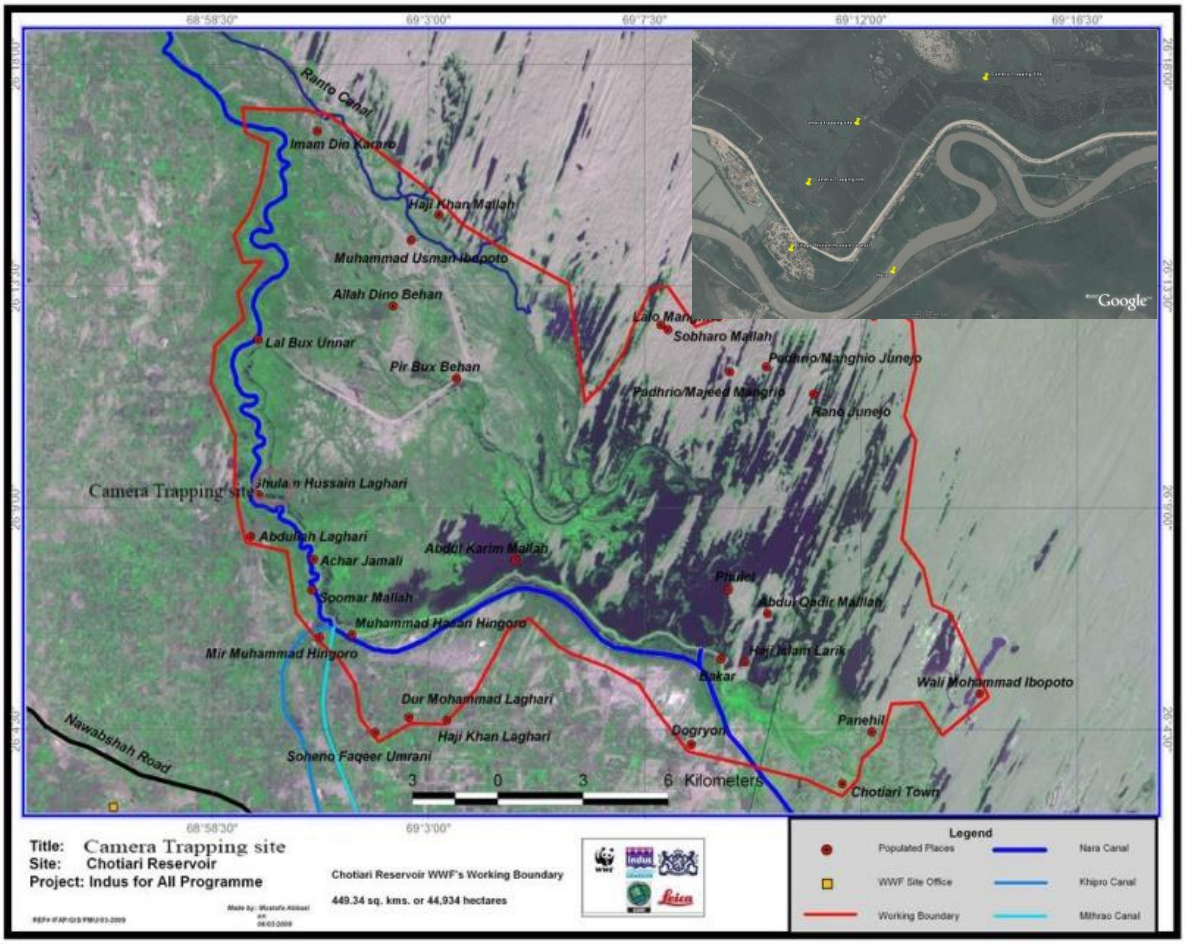

Fig. 1. Map of Chotiari Reservoir showing camera trapping site.

Fig. 2. Camera traps installed for capturing photos.

In order to verify the presence of smooth-coated otter and fishing cat in Chotiari Reservoir a reconnaissance survey was conducted to assess the hotspot of these mammals by using direct and indirect sighting technique and local community interviews. An estimate of the smooth-coated otter has been made based on this survey. Habitat was evaluated during the survey. Safe and active sites were identified for installation of the camera traps. Total of four active sites were identified with the help of local community. All the sites were situated inside the Chotiari Reservoir near Makhi Forest. The sites have very limited anthropogenic activities thus considered as appropriate for camera trapping.

The selected sites were densely covered by the wild plant species as *Typha elephantina, Typha domingensis, Phragmites karka, Phyllanthus reticulatus, Alhagi maurorum Luffa echinata, Schoenoplectus litoralis, Tamarix aphylla, Tamarix indica, Acacia nilotica* and other herbaceous hydrophytes e.g. *Bacopa monnieri, Phyla nodiflora, Cynodon dactylon, Cyperus rotundus, Cyperus bulbosus etc.*

Four of Reconyx HyperFire PC 800 with elimination range of 70 ft. taking 3.2 MP color picture by day and monochrome by night, capable to take 2 frames per second. The camera traps has infrared sensors to detect animal movement and automatically captured the movements. New batteries were installed that capable to capture 10,000 pictures. The cameras were set on automatic mode with 1 frame per second/trigger on normal mode. Before installing the cameras was passed through walk test to ensure the results. All the cameras were installed at right angle just 1.5-2 feet above the ground level (Fig. 2). The data were accumulated with every three days interval from the cameras and analyzed on the spot.

RESULT AND DISCUSSION

While selecting the sites for installation of the camera traps an estimate of the population of smooth-coated otter was made (Table 1) which is based primarily on the account of locals and animals foot prints. The survey indicates that there is a healthy population of smooth-coated otter in the Chotiari Reservoirs, however, this survey did not include any direct sighting of the otters.

Table 1. Estimates of population of smooth-coated otter in the Chotiari Reservoirs based on accounts of locals and foot prints.

Area	**Locations**	**Estimated Population**
Bakar	Old Bakar Lake near Bakar village	6
Near outlet	Fish farms between Bakar and outlet of the reservoir	10
Outlet to Pakseri	Outside of the reservoir, natural ditches and fish farms	20
Pakseri to Lal Bux Unnar village	Inside and outside of the reservoir seepage and fish forms	30
Pumping station Akenwari	Pumping station to inlet of the reservoir (outside of the reservoir)	20
Total		**86**

Camera traps have been extensively used for population estimates and behavior of other species (Leuchtenberger *et al.,* 2014; Prakash *et al.,* 2012) but authors have no information about their use for estimating population of smooth-coated otters. Fishing cat has been studied through camera trap by Karki (2011) and Lynam *et al.,* (2013). During initial part of the present study, four camera traps (numbered as 1 to 4) that were deployed near Makhi Forest, Chotiari Reservoir did not take any photographs of the targeted species except few birds including *Acridotheres tristis* (Common myna), *Ixobrychus cinnamomeus* (Cinnamon bittern) and *Amaurornis phoenicurus* (White-breasted waterhen). During the third week of the survey camera no. 3 was taken monochrome photographs of a fishing cat (Fig.3). The camera no. 1 and 2 successfully captured monochrome and colour photographs of a family of smooth-coated otter having five members in the group visited about three time of the same location at different timings within 24 hours (Fig. 4). These otters were observed resting and playing within the group (Table 2). Camera no.4 was also success to capture a fishing cat but unfortunately the pictures was out of focus as the cat was very near the camera but its identification is confirmed because of shape of animal and markings thereupon.

Fig. 3. Camera trap # 3 & 4 showing fishing cat.

Fig. 4. Camera traps # 1 & 2 showing smooth-coated otter).

Table 2. Details of captured photos of smooth-coated otter and fishing cat at Chotiari Reservoir.

Camera	Species	Date	Time	Temperature	Number of frames
01	Smooth-coated 0tter	22-07-2012	08:32:03-8:33:47 AM	30°C	06
	Smooth-coated otter	22-07-2012	10:30:44-10:31:12 AM	34°C	06
02	Smooth-coated otter	22-07-2012	05:38:27-05:38:29 AM	28°C	05
	Smooth-coated otter	22-07-2012	08:26:46-08:33:44 AM	30°C	18
	Smooth-coated otter	22-07-2012	10:30:06-10:30:09 AM	37°C	05
03	Fishing cat	20-07-2012	07:58:51-07:58:54 PM	31°C	03
	Fishing cat	21-07-2012	06:43:39-06:43:50 PM	36°C	08
04	Fishing Cat	21-07-2012	05:41:58-05:43:10 AM	26°C	30

The percentage of captured photographs is given which reveals that fishing cat was observed 33 % of the captured times of camera whereas smooth coated otters occupied 30 % of the time where birds were observed at 27 % of the captured time and at 10 % time there photograph capture was empty.

Fishing cat food consists of fish and other small animals including crabs, invertebrates and birds which are hunted by the cat (Haque and Vijayan, 1993). During the survey, fishing cat was observed in the same area where smooth-coated otter were noticed especially on those places where the otter usually eat their prey. The fishing cat

visits this area to consume the remains of the fish eaten by otters. This association between two carnivorous mammal species observed during the present study where fishing cat which is a predator hunting for aquatic animals also scavenge on the food remains of smooth-coated otters. While working on camera trapping it was noticed that the foraging success generally increases within the mixed mammalian associations (Venkataraman, 2015). The association between two carnivorous mammal species observed during the present study required further studies for detail inter-species behavior and association type.

Fishing cat is an endangered animal according to the IUCN Red List whereas, smooth-coated otter is considered vulnerable with decreasing population trend. There is a need to study the detailed ecology of these important animals by using camera trap technology as well as collection of information about of the biology the two species in the area.

The study proved that camera trapping is a cost and time efficient method for rapid assessment and to determine status, abundance and occurrence of wildlife in a particular area, it is generally used for the confirmation of the presence of particular species. Several researchers published paper on the otter presence at Chotiari Reservoir but not directly observed them however, the camera trapping survey has confirmed the presence of healthy population of this precious species in the Chotiari wetland habitat.

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REFERENCES

Bernard .H., A. H. Ahmad, J.Brodie, A. J. Giordano, M. Lakim, R. Amat, S.K.P. Hue, L. S. Khee, A. Tuuga, P.T. Malim, D. Lim-Hasegawa, Y. S. Wai and W. Sinum (2013). Camera-trapping survey of mammals in and around Imbak Canyon Conservation area in Sabah, Malaysian Borneo. *Raffles Bull. Zool.,* 61: 861–870.

Haque, N. M. and V. Vijayan (1993). Food habits of the fishing cat Felis viverrina in Keoladeo National Park, Bharatpur, Rajasthan. *Journal of the Bombay Natural History Society*, 90: 498-500.

Jenks, K. E., P. Chanteap, K. Damrongchainarong, P. Cutter, P. Cutter, T. Redford, A. J. Lynam, J. Howard and P. Leimgruber (2011). Using relative abundance indices from camera-trapping to test wildlife conservation hypotheses – an example from Khao Yai National Park, Thailand. *Trop. Conserv. Sci*., 4: 113-131.

Karanth, K. U. and J. D. Nichols (1998). Estimation of tiger densities in India using photographic captures and recaptures. *Ecology*, 79: 2852–2862.

Karki, J. B. (2011). Distribution of some small cats in Chitwan National Park. In: *Proceedings of Second Seminar on Small Mammals Issues* (Dahal, S. and S. Thapa eds.). Pp. 40-45. Small Mammals Conservation and Research Foundation, New Baneshwor, Kathmandu, Nepal.

Khan, W. A. and S. A. Hasnain (2008). *Large mammals at Indus for all programme sites (Unpublished Report)*. WWF-P, Karachi, pp. 88.

Khan, M. Z., I. S. Khan, S. A. Ghalib, D. Abbas and T. Jabeen (2013). Vertebrate bbiodiversity of Nara Game Reserve, Sindh, Pakistan. *Int. J. Biol. Biotech*., 10: 383-394.

Khan, W.A., M. Qasim, E. Ahmad, A. A. Chaudhry, H. B. Bhaagat and M. Akhtar (2010). Status of smooth-coated otter (*Lutragale perspicillata)* in Pakistan. *Pakistan J. Zool*., 42: 817-824.

Kucera, T. E. and R. H. Barrett (1993). The Trailmaster camera systems for detecting wildlife. *Wildl. Soc. Bull*., 21: 505–508.

Leuchtenberger, C., C. A. Zucco, C. Ribas, W. Magnusson and G. Mourão (2014). Activity patterns of giant otters recorded by telemetry and camera traps. *Ethology Ecology & Evolution*, 26: 19-28.

Lynam, A. J., K. E. Jenks, N. Tantipisanuh, W. Chutipong, D. Ngoprasert, G. A. Gale, R. Steinmetz, R. Sukmasuang, N. Bhumpakphan, L. I. Grassman, Jr., P. Cutter, S. Kitamura. D. H. Reed, M. C. Baker. W. McShea, N. Songsasen and P. Leimgruber (2013). Terrestrial activity patterns of wild cats from camera-trapping. *Raffles Bulletin of Zoology*, 61: 407-415.

Mace, R.D., S. C. Minta, T. L. Manley and K. A. Aun (1994). Estimating grizzly bear population size using camera sightings. *Wildl. Soc. Bull*., 22: 74–83.

Mohd-Azlan, J. and E. Lading (2006). Camera trapping and conservation in Lambir Hills National Park, Sarawak. *Raffles Bull. Zool.,* 54: 469–475.

Prakash, N., D. Mudappa, T. S. Raman and A. Kumar (2012). Conservation of the Asian small-clawed otter (*Aonyx cinereus*) in human-modified landscapes, Western Ghats, India. *Tropical Conservation Science*, 5: 67-78.

Rais, M., M. Z. Khan, D. Abbass, G. Akber, R. Nawaz and S. Islam (2011). A qualitative study on wildlife of Chotiari Reservoir, Sanghar, Sindh, Pakistan. *Pakistan J. Zool*., 43: 237-247.

Rais, M., M. Z. Khan, D. Abbass, I. S. Khan, S.A. Ghalib, F. Tabbassum, G. Akber and R. Nawaz (2008). Changes in the avifauna of the wetlands of District Sanghar, Sindh, Pakistan. *Berkut.* 17 (1-2): 13-24.

Rais, M., M. Z. Khan, S. A. Ghalib, D. Abbass, W. A. Khan, S. Islam and A. Husnain (2009). Recent records of smooth-coated otter (*Lutrogale perspicillata*) form Sindh, Pakistan. *Pakistan J. Zool*., 41: 413-414.

Rais, M., M. Z. Khan., D. Abbass and G. Akber (2010). Study on some medium-sized and large mammals of Chotiari Wetlands Complex, Sanghar, Sindh, Pakistan. *J. Basic and Appl. Sci*., 6: 63-67.

Silveira, L., T. A. Anah, A. T. A. Jacomo and J. A. F. Diniz-Filho (2003). Camera trap, line transect census and track surveys: A comparative evaluation. *Biol. Conserv.,* 114: 351-355.

Venkataraman, V. V., J. T. Kerby, N. Nguyen, Z. T. Ashenafi. and P. J. Fashing (2015). Solitary Ethiopian wolves increase predation success on rodents when among grazing gelada monkey herds. *J. Mammal*., 96:129–137.

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