PROCEEDINGS OF

THIRD SEMINAR ON SMALL MAMMALS CONSERVATION ISSUES

Small Mammals Vulnerable to Climate Change

May 18, 2012

Yak Palace, Hotel Narayani, Pulchowk, Lalitpur, Nepal

PROCEEDINGS OF THIRD SEMINAR ON SMALL MAMMALS CONSERVATION ISSUES - 2012

Organized by: Small Mammals Conservation and Research Foundation, Kathmandu, Nepal
In collaboration with: Department of National Parks and Wildlife Conservation, Babar Mahal, Kathmandu
In Financial Support from:
National Trust for Nature Conservation, Khumaltar, Lalitpur
WWF Nepal, Baluwatar, Kathmandu
Himalayan Nature, Lazimpat, Kathmandu
Nepal Academy of Science and Technology, Khumaltar, Lalitpur

Edited by: **Hem Bahadur Katuwal** and **Sabina Koirala**
ISSN: **2091-2056**

Suggested citation: Katuwal, H.B. and S. Koirala (Eds.) 2012. Proceedings of Third Seminar on Small Mammals Issues. Small Mammals Conservation and Research Foundation, New Baneshwor, Kathmandu, Nepal, 55 pp.

ACKNOWLEDGEMENTS

SMCRF organizes an annual event the "seminar on small mammals issues" since 2010 with collaboration of its partner stakeholders and in support from different organizations. At first we would like to express sincere gratitude to Advisory Committee members especially, Mr. Juddha Bahadur Gurung and Dr. Shanta Raj Jnawali for their continuous advice and support. We are greatly thankful to the review committee; Dr. Paul Racey, Regius Professor (Emeritus), Aberdeen University, Scotland, UK; Dr. Merlin D. Tuttle, Founder, Bat Conservation International, USA; Dr. Nikky Thomas, Harrison Institute; Dr. Debbie Bartlett, University of Greenwich, UK and Daniel W. Challender, Co-chair, IUCN SSC Pangolin Specialist Group for their precious time in reviewing and commenting to the papers for the seminar.

We thank DNPWC for the collaboration. This seminar would not have been a success, if WWF Nepal, NTNC, NAST and Himalayan Nature had not backed with financial support. In this term, we are indebted to Mr. Deepak Kumar Singh, NTNC; Dr. Shanta Raj Jnawali, Dr. Narendra Man Babu Pradhan, WWF; Mr. Sharad Kumar Singh, Himalayan Nature and Mr. Omini Acharya, NAST for their kind encouraging support.

We were glad to welcome Mr. Kamal Jung Kunwar, DNPWC as the chief Guest. We are grateful to his presence, Dr. Hem Sagar Baral for keynote, Dr. Krishna Chandra Shrestha, Former Professor of Tri-Chandra Campus and Prof. Dr. Khadga Basnet, Central Department of Zoology for the session chair.

We also appreciate the tireless contribution of volunteers, SMCRF Executive members and other direct and indirect supporters.

Editors

CONTENTS

Keynote Speech:

Oral Presentations:

Study of Fishing Cat (*Prionailurus Viverrinus*) in Nepal: Past, Present and Future

Sagar Dahal
Small Mammals Conservation and Research Foundation, New Baneshwor, Kathmandu, Nepal
Correspondence: sagardahalinktm@gmail.com

Abstract: *Prionailurus viverrinus,* is a small cat widely known as fishing cat. It is mostly associated with wetlands and marshy areas. Fishing cat was described for the first time in the literature by Bennet (1833). Hodgson (1836) gave the first description of fishing cat in Nepal. He gave a short note on its morphological characters and mentioned that it had affinity to Viverrae like face. Pocock (1939) provided skull measurement of the species collected from Sehwan, Sind, Nepal and Kanthalai Ceylon. There remains a long gap in the study of Fishing cat afterwards. Charles McDougal and James L.D. Smith (1984) wrote that the fishing cat is the second most common small cat in Chitwan National Park with indeterminate status in the Terai. IUCN Red Data List gives the account of only radio-telemetry study on fishing cat done on early 1990's at the Chitwan National Park, Nepal. Recent studies on Fishing cat after 2010 has provided the distribution of fishing cat with geographical coordinates in Koshi Tappu Wildlife Reserve, Suklaphanta Wildlife reserve, Bardia National Park, Chitwan National Park. However, their distribution in Parsa wildlife Reserve and outside the protected area of Tarai Arc Landscape is unknown. Fishing cat are known to suffer from habitat destruction and human conflict in Bangladesh, India and Thailand. Such study has not yet been carried out in Nepal. A detail study of distribution range, population, habitat analysis and conservation threat along Terai Arc Landscape in Nepal is urgent.

Keywords: *Prionailurus viverrinus,* small cat, Chitwan National Park, literature

Introduction

Prionailurus viverrinus, a small cat, is popularly known as fishing cat. It is mostly associated with wetlands and marshy areas. Fishing cats are good swimmers and fish have been found to be its most frequently taken prey in Chitwan National Park, Nepal [23]. However, according to Pocock (1939) the name fishing cat is misleading. The teeth are neither especially adapted in any way of catching/eating fish and for crushing shells of molluscs nor they share greater liking for fish than wild cats of other species; they are fit for preying upon any terrestrial vertebrate animals they can overcome, and there are record cases of calves, sheep, dogs, and large snakes being killed by it [26].

Wozencraft's (1993) classified the small cats within subfamily Felinae [23]. Subfamily Felinae contains 13 genera and genus *Prionailurus* contains four species including fishing cat. Firstly, fishing cat was named *Felis viverrinus* [5]. The species name *viverrinus* was given due to its civet like morphological character. Again, the species was named *Felis himalayanus*, Himalayan Serval [16], *Felis viverriceps*, sharp face cat [15], *Viverriceps bennetti* [12]. Severtzov (1858) changed the name *Felis* and *Viverriceps* to *Prionailurus* [21]. The present classification *Prionailurus viverrinus* is accredited to Bennett as he first described the species to the world though the genus *Prionailurus* is taken from the work of Severtzov. The genus *Prionailurus* is derived from the Greek word "prion" meaning saw (as in tool that slices wood) and "ailur" meaning cat. Fishing cat is placed in *Prionailurus* according to genetic analysis [18, 24]. Common name of fishing cat in Nepali is "Malaha Biralo" [4]. Fish is found as the major diet of fishing cat which is followed by birds and insects in an study done on Keoladeo National Park, Bharatpur Rajasthan India [13]. In the same study rodents were the least preferred diet where as other species recorded were seeds, hair of hare and cattle, mollusks, sales of snakes and monitor lizard. Fishing cat also prey on small civets, young chittal fawns, wild pigs, domestic goats, calves, dogs, poultry and water fowls where as it has also been seen scavenging tiger kills and live stock carcasses [23]. Fishing cat is ranked 334 in the category of Evolutionary Distinct and Globally Endangered (EDGE) animal with Evolutionary Distinct rank of 9.52 and EDGE score of 4.43 (http://www.edgeofexistence.org/mammals/species_info.php?id=390). Fishing cat being a small carnivore is believed to check the small mammal's population like rodents in ecosystem.

Materials and methods

I used secondary data collection and literature review to find the records of fishing cat observed and studied in Bangladesh, India, Nepal, Pakistan, Srilanka and Thailand. The articles from Journal of Asiatic Society of Bengal, Proceedings of Zoological Society of London, and Journal of Bombay Natural History Society were extensively studied to find the record of fishing cat studies. Bibliography present in the fishing cat working group website was very useful to find the source of literatures on this less studied species. Recent account on the status of fishing cat was taken from the website of IUCN red list. Other relevant information were taken from the local conservation newsletters, magazines, proceedings of the seminars, unpublished reports, short communications and personal communications.

Results

Study of Fishing Cat in Nepal: Past and Present

Fishing cat was described for the first time to science by J.M. Heath (1833) in an oral presentation at a meeting of the Zoological Society of London. The first description was published in the same year by Bennet in the proceedings of Zoological Society of London. The author mainly described the morphological structures of the species. However, he did not provide the information on distribution or where it was obtained from. William Jardine (1834) gave the brief information about the species with the diagrammatical plate 24 under the name *Felis himalayanus*. He also described the morphological characters and gave an account on the skin received from the Himalayan district of India. Both William and Bennett compared the species with serval but differentiate it with the morphological characteristics and size. Fishing cat is smaller than the serval. The first description of fishing cat in Nepal was given by Hodgson (1836). He gave a short note on the morphological characters and mentioned that it has affinity to Viverrae like face and Lynx by the shortness of its tail but has no further resemblance to either. Hodgson also provided the anatomical features of intestine being three times the length of the body and caecum an inch long. M.S. Hodgson recorded one male individual of fishing cat in Bankalwa, Morang and said that it was a common wild cat of the Tarai [14]. The length of skull of fishing cat was given five inches and width of three inches and eight lines [12]. Daniel Giraud Elliot described the distribution of fishing cat in open lower regions of Nepal and Tarai according to Horsfield in his imposing monograph published between 1878 and 1883 [29]. Robert A. Sterndale (1884) provided the common name of the species from different parts of India. He provided a brief description on the distribution and behavior of the species. He also gave description on the structure of bones and morphological characters. The cat is known to be fierce and untamable by Buchnan Hamilton but Blyth states that he had frequently handled and had even held on his hand in the Surrey Zoological Garden and perfectly tamable [30]. Blanford (1888) also provided the general description of morphology, skeletal structure, dimension, distribution and feeding habit. Lydekker in volume I of the four volume of "The Royal Natural History" (1893-94) wrote that it was found along the flanks of the Himalaya as far westward as the independent state of Nepal [29]. Pocock (1939) gave skull measurement of the species collected from Sehwan, Sind, Nepal and Kanthalai Ceylon.

Fishing cat is broadly classified as small cat and described as an endemic oriental faunal zone species with discontinuous distribution and occurrence in Himalayan foot hill region of the Tarai in India extending eastward to Nepal and Assam [28]. Fishing cat is the second most common small cat in Chitwan national Park (CNP) whose status for remainder of Tarai is indeterminate [20]. A radio telemetry study of fishing cat was carried out in Chitwan NP in 1990's which showed that the home range of female was 4/6 km^2 and the male was 16/22 km^2 (J.L.D Smith pers comm. in Sunquist and Sunquist 2002 cited from Mukherjee et al. 2010) [22]. The distribution of fishing cat is recorded from Chitwan NP, Bardia NP, Suklaphanta Wildlife Reserve, Koshi Tappu Wildlife Reserve and Sunsari district [31]. Fishing cat has been recorded from Beeshazari lake of Chitwan NP [1]. Fishing cats had the very restricted distribution and were recorded from three locations around Sauraha, CNP [19]. Two individuals of fishing cat were trapped at Tiger Tops Tented Camp area of Chitwan NP [9]. In a recent study fishing cat has been recorded from Koshi Tappu Wildlife Reserve [25]. Fishing cat has also been recorded from Bardia National Park and Suklaphanta Wildlife Reserve (http://fishing-cat.wild-cat.org). Study of fishing cat is being carried out in four locations namely Sauraha, Kasara, Tiger Tops area and Island area in Chitwan NP (pers. comm. with Rama Mishra 2012) and Koshi Tappu Wildlife Reserve (pers. comm. with Dr. Hem Sagar Baral 2012).

Study of Fishing Cat in Future

Fishing cat are widely distributed through the variety of habitat types (including both evergreen and tropical dry forest [27], their occurrence is highly localized and has a discontinuous distribution [23]. The habitat, ecology, distribution, conflict and threat to the fishing cat has not been explored in Nepal. After 175 years of identification of this cat we still don't know the distribution range within Nepal. We don't have any information of their distribution within protected area of Parsa Wildlife Reserve and major wetlands, marshland, man-made reservoirs, lakes outside the protected area of Tarai Arc Landscape and eastern region. A detail survey of fishing cat within and outside the protected area of TAL and eastern region must not be delayed. Once we know the detail distribution range, the population count of fishing cat must be carried out. However, the population of fishing cat is expected to be 150-200 [17] but this is a very rough estimate. Simultaneously, threat assessment, habitat analysis, and conflict with human must be carried out. Local perception is essential for the long term conservation of any species. Ethnic local fishermen depends certain amount of their life income from fishing on natural wetlands which is a probable threat to fishing cat. Nepal does not have a fishing cat action plan yet which is a must in immediate future for the long term conservation and management. Ecological research, diet analysis, genetic analysis and evolutionary genetics of fishing cats of Nepal must be carried out in the future**.** Awareness campaign in local community is necessary during all the scientific projects. Any conservation efforts need encouraged and enthusiast community for the sustainable survival of species.

Discussion and Conclusions

Villagers of Pandav Nagar at Chitwan NP frequently visit the wetlands sites of Tiger tops tented camp area for fishing and disturb the habitat, however there were no evidence of fishing cat being killed by them [9]. The fishing cat present in the densely human populated area of Howrah and Hoogly of India suffers from retaliatory killing and accidental hit by train [3]. There are several examples of fishing cat beaten to death as retaliatory killing or just for fun from the collection of various Bangladeshi newspaper collection sent by Dr. Anwarul Islam (pers. communication 2011). In Thailand major threats that occur to fishing cat are hunting, over fishing, vegetation removal, burning of the habitat. They are also kept as high value pets and are good market commodity. Snares are used to capture the fishing cat. A large area of land has been converted to shrimp farm which is narrowing the habitat of fishing cat [7, 8]. Population density of Tarai region of Nepal is increasing. The human population density of Tarai has increased from 330 to 392 per km^2 in last decade in Nepal [2] which might be a major threat to this species in coming decades. This is an alarming call for us to learn from the examples of India, Bangladesh and Thailand for the conservation of fishing cat. Nepal has more than 23% of total area as protected area. More than 30% of area is covered with forest. Nepal has many examples of successful conservation program in the conservation history. Successful launch and continuation of vulture restaurant, zero poaching of one horned rhinoceros, continuous increase in the number of Tiger population and success of Gharial crocodiles breeding project have set standards in the conservation of endangered species in Nepal. Fishing cat is also endangered species with decreasing population trend in World [22] and Nepal might have good population account of this species. Will we repeat the examples of India or Bangladesh or Thailand in our coming future? Or shall we act when the things are still under control.

References

[1] Acharya D., Aryal B., Joshi S., and D.R. Neupane. 2007. Beeshazari lake on the brink of extinction. Conservation Watch Nepal 1(3): pp 1-2.

[2] Adhikari, N. (Eds). 2012. International Forum. Introduction to Nepal 2011/12. International Forum publication P. Ltd, Anamnagar, Kathmandu, Nepal. 7-17.

[3] Adhya, T. 2011. Status survey of Fishing cats (*Prionailurus viverrinus*) through community participation in and around the major wetlands of Howrah and Hooghly, West Bengal, WWF India.

[4] Baral, H.S. and K. B. Shah. 2008. Wild Mammals of Nepal. Himalayan Nature, Kathmandu.

[5] Bennet, E.T. 1833. *Felis viverrinus*. Proceedings of the zoological society of London Part I: printed by Richard Taylor, 68-69. London.

[6] Blanford, W.T. 1888. The Fauna of British India, including Ceylon and Burma. Mammalia. Taylor and Francis, London.

[7] Cutter, P. 2007. Surveys for Fishing Cat (*Prionailurus viverrinus*) in Thale Noi Non-Hunting Area, Pattalung Province, Thailand, May 2006 - February 2007. Report: 1-25. Report to Smithsonian's National Zoological Park and Cincinnati Zoo.

[8] Cutter, P. 2009. Camera Trapping and Conservation Status Assessment of Fishing Cats at Khao Sam Roi Yod National Park and the Surrounding Areas, Thailand.

[9] Dahal, S. and D.R. Dahal. 2011. Trapping of fishing cat in Chitwan National Park, Nepal. Cat News 55: 10-11.

[10] http://www.edgeofexistence.org/mammals/species_info.php?id=390

[11] http://fishing-cat.wild-cat.org

[12] Gray, J.E. 1867. The skulls of the Felidae. Proceedings of Zoological Society of London, 268, London.

[13] Haque, N. M. and Vijayan, V. 1993. Food habits of the Fishing cat *Felis viverrinus* in Keoladeo National Park, Bharatpur , Rajasthan. Journal of Bombay Natural History Society. 90: 3 498-500

[14] Hinton, M.A.C. and T.B. Fry. 1928. Mammals survey of Indian, Burma and Ceylon. Report No. 37 Nepal. Journal of Bombay Natural History Society. 2: 399-428.

[15] Hodgson, B.H. 1836. *Felis viverriceps*. Synoptical description of Sundry New Animals, enumerated in the Catalogue of Nipalese Mammals. Journal of the Asiatic Society of Bengal 5: 232.

[16] Jardine, W. 1834. Himalayan Serval. The Naturalist's Library I. Mammalia 2:230-231.

[17] Jnawali, S. R., Baral, H. S., Lee, S., Subedi, N., Acharya, K. P., Upadhyay, G. P., Pandey, M., Shrestha, R., Joshi, D., Lamichhane, B. R., Griffiths, J., Khatiwada, A. and Amin, R. in press. The Status of Nepal's Mammals: The National Red List Series. Department of National Parks and Wildlife Conservation, Kathmandu, Nepal.

[18] Johnson, W.E., Eizirik, E., Pecon-Slattery, J., Murphy, W.J., Antunes, A. Teeling E., and S.J. O'Brien. 2006. The late Miocene radiation of modern Felidae: a genetic assessment. Science. 311. 73-77

[19] Karki, J. 2011. Distribution of some small cats in Chitwan National Park. Proceedings of Second Seminar on Small Mammals Issues, 85. Small Mammals Conservation and Research Foundation, New Baneshwor, Kathmandu, Nepal.

[20] McDougal, C. and J.L.D. Smith. 1984. Status of cats in Nepal. Proceedings from the Cat Specialist Group meeting in Kanha National Park,143, India.

[21] McKeena, M.C. and S.K. Bell. 1997. Classification of mammals – above the species level. Columbia University Press. New York.

[22] Mukherjee S., Sanderson, J., Duckworth, W., Melisch, R., Wilting A., Sunarto S. and Howard J. G. 2010. IUCN Red List of Threatened Species. Version 2011. www.iucnredlist.org.

[23] Nowel, K. and Jackson, P. 1996. Wild Cats: A status Survey and Conservation Action Plan. IUCN/SSC Cat Specialist Group, Gland, Switzerland.

[24] O'Brien, S. J. and W.E. Johnson. 2007. The evolution of cats. Scientific American 297: 68-75.

[25] Pandey, P. and P. Kaspal. 2011. Small Mammals Survey in and around Koshi Tappu Wildlife Reserve, Nepal. Proceedings of Second Seminar on Small Mammals Issues, 40-45. Small Mammals Conservation and Research Foundation, New Baneshwor, Kathmandu, Nepal.

[26] Pocock, R.I. 1939. The Fauna of British India, including Ceylon and Burma. Mammalia. Primates and Carnivore (in part) families Felidae and Viverridae. Taylor and Francis, London. 1: 281-284.

[27] Rabinowitz, A.R. and S. R.Walker. 1991. The carnivore community in a dry forest mosaic in Huai Khaeng Wildlife Sanctuary, Thailand. Journal of Tropical Ecology, 7: 37-47

[28] Roberts, T.J. 1977. Mammals of Pakistan. Ernest Benn Limited, London, UK.

[29] Sanderson J. 2009. How the fishing cat came to occur in Sumatra? Cat News 50: 6-9.

[30] Sterndale, R.A. 1884. Natural History of the Mammalia of India and Ceylon. Thacker, Spink and Co., Calcutta.

[31] Suwal, R. Verheugt, W.J.M. and P. Yonzon. 1995. Enumeration of Mammals of Nepal. Biodiversity Profiles Project Publication No. 6. Department of National Parks and Wildlife Conservation, Kathmandu.

[32] Wozencraft, W.C. 1993. Order Carnivora. In Mammals Species of the World, Second Edition. Wilson, D.E. and Reeder, D.M. (Eds.). Smithsonian Institution Pres, Washington and London.