

SHEKHAR S. KOLIPAKA^{1*}, D. P. SRIVASTAVA², SHANTANU PRASAD³ AND NIKI A. RUST⁴

Fishing cat conservation in human-dominated landscapes in West Bengal, India

In India, fishing cats *Prionailurus vivverinus* are found both in protected and unprotected landscapes. To ensure the continued survival of fishing cats in the unprotected human-dominated Amta block of West Bengal state, local conservation enthusiasts started the 'Baghrol Basa Fishing Cat Project' in 2016. Their efforts to safeguard the fishing cat revealed fascinating findings into the lives of this felid species that appears to be able to live alongside humans. The project's efforts to increase interest within the local community to support fishing cats in the 30 km² area show first results. In this case study, we provide insights into the progress of the project. The experiences offer optimism that, in India, human-fishing cat coexistence may be less concerning than survival of leopards or tigers in human-used lands. To roll out this project further and help protect fishing cats in other unprotected areas, the Baghrol Basa Fishing Cat Project plans to look beyond its current work area to similar adjoining human-dominated lands of West Bengal.

The fishing cat's range in India is large and covers the east coast and the flood plains and mangrove areas of West Bengal state. It also extends into central India and the Him-

alayas where the cats exist next to smaller rivers and their catchments that eventually confluence with the main rivers like Godavari, Krishna, Ganga and Brahmaputra. Within

its range in India, the Indian Wildlife Protection Act 1972 lists fishing cat as a Schedule I species meaning Endangered and globally the IUCN Red List classifies it as Vulnerable (WPA-India 1972, Mukerjee et al. 2016).

The fishing cat is a wetland specialist and half its population in India is thought to live in protected areas, with the rest in unprotected habitat (Mukerjee et al. 2016). There are a few large coastal wetland protected areas that could support more than 100 individuals of the species, such as the Coringa Sanctuary in Andhra Pradesh and the Sundarbans in West Bengal (Sathiyaselvam & Satyanarayana 2016). The majority of the inland protected areas within the fishing cat range, like the Kaziranga National Park NP, Nameri Chitwan NP and others, though large, have small habitats suitable for this wetland specialist. Both the coastal and inland protected areas are fragmented, where areas surrounding these NPs are mosaics of human-used lands including villages, towns, cities and intensively farmed landscapes.

Because a large proportion (50%) of India's fishing cats live in unprotected habitat or in highly fragmented protected areas, two main questions of conservation relevance are raised: A) How safe are the unprotected areas for the survival of a species since a significant portion of its population lives in unprotected, human-used lands? B) How to ensure their continued survival in these unprotected lands? In this article, we document the experiences of a project to conserve fishing cats in the unprotected, human-dominated lands of West Bengal state in India with insights into how we might go about answering the two questions.

The Project Area

The Hooghly River (traditionally known as the Ganga) flows through West Bengal to the Bay of Bengal (Fig. 1). This area has many wetland habitats where people raise fish in seasonally-flooded areas. This area is relatively rich in biodiversity and home to several mammal species including numerous mammal, bird, reptile, fish and insect species adapted to wetland habitats

The Tourism Model

To ensure the continued survival of a population of fishing cats in the Amta block of West Bengal, a group of local conservation enthusiasts headed by Shantanu Prasad started the 'Baghrol Basa Home Stay' in 2016. They established the following institutions and

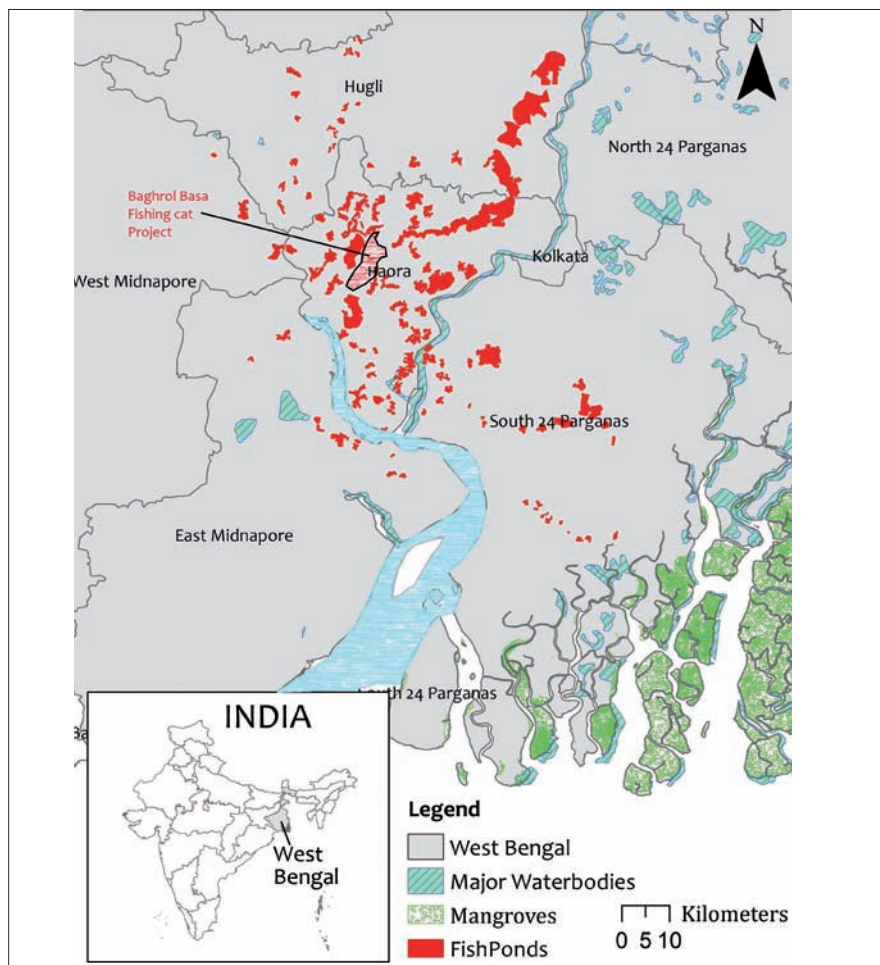


Fig. 1. The location of the Baghrol Basa Fishing Cat Project site (pink) and the areas with fish ponds in the landscape (Red). Map made by S. S. Kolipaka.



Fig. 2. A fishing cat stalking prey in a privately-owned fish pond in Kalbansh village of Amta Block, West Bengal, India (Photo S. Prasad).

activities: (1) they set up a travel company called Forest Dwellers that offers specialised wildlife tours in West Bengal and the North Eastern States of India; (2) they established Bhagrol Basa Home Stay as an independent unit that offers photographic tours focused on fishing cats; and (3) they set up Harbes Nest another home stay unit that focuses on Red Pandas. 20% of their profits from 1, 2 and 3 are channelled into an NGO that they set up called WATER – Wildlife Awareness Trust for Environment and Research. The fishing cat project is financed by WATER. Shantanu Prasad and his team at Bhagrol Basa drive tourists at night time on specific routes into an unprotected area of water-

logged swamps and fish ponds to see fishing cats and other nocturnal wildlife covering 30 km². Fishing cats are sighted almost every night during these drives and photographs are taken and catalogued by staff and tourists to identify individuals (Fig. 2, 3). The photographs allowed individual identification based on their unique facial markings and coat patterns. Camera traps are additionally set up by the staff to record photos and videos to help uncover more information about their behaviour such as their activity patterns, interactions with other wildlife, and their activities around fish ponds. The project personnel also engage with local communities to understand the problems that people

have from local wildlife. For example, local people complain that fishing cats raid fish ponds and steal large commercially valuable fish. There are also incidents of local people eating fishing cats for ritualistic reasons. The project personnel are currently trying to understand the scale of fish losses and frequency of killings of fishing cats. Gathering such information is not so straight forward so SSK (Author 1) is helping the project personnel to systematically gather information. The strategy is to deploy camera traps near fish ponds to understand the frequency of fishing cat visits and catch success, analysis of scats to understand diet and to talk to local people and understand more about the consumption of fishing cats.

Results

Insights into the lives of fishing cats

Over 2,000 fishing cat photos made during night drives between March 2016 and January 2019 reveal 19 individual cats living with-in the 30 km² area. Videos were also made using camera traps. These photos and videos provide qualitative insights into the behaviour of fishing cats in this area, their interactions with other carnivores, and their dependence on fish ponds (Figs. 4–6; Supporting Online Material SOM Figures F1–F4, Videos V1–V3). Fishing cats with cubs (Fig. 7) were also recorded on three occasions, suggesting that these human-use areas have favourable sites for fishing cats to den and raise young.



Fig. 3. Profile pictures of individual fishing cats, identified by their unique facial markings, scars and whisker patterns (Photos Bhagrol Basa Fishing Cat Project).



Fig. 4. Jungle cat in the Kalbansh village, Howrah District, walking towards a bridge a few hours after a fishing cat crossed the bridge (SOM F1; Photo S. Prasad).



Fig. 5. Fishing cat crossing a path while a golden jackal sits watching. No antagonistic behaviours were recorded between the two species and, after the fishing cat passed, the golden jackal moved to the place where the fishing cat fed on a fish and ate the remains (Photo by S. Prasad; see SOM V1).

The Human Dimension: Understanding conflicts

Local fish pond owners complained of losses of fish from fishing cats. We have photographic evidence of fishing cats catching large carps and catfish from ponds. However, the availability of fish in ponds is highly variable. Before the onset of the summer monsoon in June/July fish ponds are emptied of fish. Fish seedlings are reintroduced in October/November and fish losses occur at various life stages of the fish. For instance, small fish are caught by birds like the kingfisher and heron. Slightly larger fish are eaten by monitor lizards and snakes. Since fishing cat also feeds on frogs, birds, beetles, snakes, rodents and monitor lizards near the ponds, their presence near ponds cannot be linked to fish losses alone. The fishing cat as a top predator is also performing a regulatory function by preying on the primary and secondary consumers. A thorough study on the diet of fishing cat is therefore required. When the role of the fishing cat was explained to the pond owners and photos and videos shown, there was increased openness to see the fishing cat from a new perspective. Two incidents of retaliatory killings of fishing cats and one instance of ritualistic consumption of the dead cats by people were reported. Open interviews by DPS (co-author) unearthed that pond owners are concerned about human thieves who steal fish at night time. They maintain a high level of vigilance, especially before the harvesting period. During this tense period, if fishing cats are caught stealing fish, people may retaliate and kill the odd fishing cat. We did not find any evidence of local people trying to systematically target fishing cat with an intention to exterminate it completely. Since the fishing cat is protected by Indian law the subject of eating fishing cats is sensitive to local people and such data is not easy to collect. It will take more time to fully understand this cultural aspect.

Engagement with local people:

The fishing cat project fully funded some initiatives and the project personnel discussing initiatives with local people with the goal to improve poor relations with community members and to increase local interest in the fishing cat project. Examples include:

Local Employment: Over 100 local village community members were provided temporary work during the renovation of the Bhagrol Basa Home Stay. Thirty people are employed for at least 100 days a year maintaining and running Baghrol Basa homestay.

Fish Fingerlings Donation Programme: Under this programme fisherman who complained of severe fish losses (from any factor) are given fish fingerlings (young fish) as a goodwill gesture. Since November 2017 until January 2019, four affected pond owners were given 30–60 kg fish fingerlings per pond per year. This programme is financially demanding and more effective ways of compensating losses have to be found. So far the programme showed a high potential to improve human tolerance of fishing cats near some ponds.

Awareness Programmes: Local awareness programmes on fishing cats and other local wildlife were conducted annually. In total, approximately 2,000 schoolchildren and their parents attended these programmes. As a next step, by customising educational material provided by Munich Zoo, Germany, there are plans, for example, to show the regulatory effects of fishing cats to a wider audience and position the fishing cat as a friend of the pond owner.

Dog Vaccination Programme: Rabies is common in the area. On the request of the local villagers, rabies vaccinations for domestic dogs (street dogs and pets) were administered by the fishing cat project personnel in 5

villages. In the first phase, 80 dogs were vaccinated through a partnership with the local animal health department. The programme was received well by the local communities. Continuing and expanding the rabies programme could benefit both people and local wildlife from dog-related disease risks.

Discussion

In a human-dominated landscape, the conflict between people and wildlife is likely if wildlife and people utilise the same resources. Clearly identifying conflicts and their root causes is critical (Madden & McQuinn 2015). Innovative and adaptive ways of addressing conflicts and minimising collateral damage are central to conservation success in human-dominated lands (Kolipaka 2018). The project experience shows that financial incentives to people help but more low cost and non-monitory ways of soliciting support need to be found. The project personnel are being trained to adapt to this need and to maintain a good relationship with local communities to ensure that there is local buy-in for this conservation project. This process of building and maintaining good relations could help to limit conflicts being redirected at fishing cats, given that most “human-wildlife conflicts” are instead conflicts between different groups of people over how to manage wildlife (Redpath et al. 2013). If this species is to survive in the long-term, conserving fishing cats outside protected areas can help ensure gene flow between protected areas. It is essential that the involvement of the communities living with this species is increased to gain support for the species. West Bengal provides a positive case study of how a local tourism project can generate its own money and channel some of its profits towards fishing cat conservation. This is one way to provide sustained and crucial funding for conserving this species. Our preliminary case study shows the fishing



Fig. 6. Fishing cat sitting in front of a house highlights the proximity at which people and fishing cats live in the Kalabansh area (Photo by M. Kanti Kar).



Fig. 7. Fishing cat with three cubs was photographed in March 2019 by a tourist Mr Robin Hamilton near Bhagrol Basa (Photo by R. Hamilton).

cat can adapt well to living in close proximity to humans in West Bengal. Whilst protected areas continue to be essential for the conservation of cat species, adaptable species like the fishing cat can live alongside humans where there is tolerance to coexist and suitable habitat.

Acknowledgements

The authors wish to thank the staff of the Bhagrol Basa Home Stay and those working in the Fishing Cat Project as well as the local communities who live alongside fishing cats.

References

Madden F. M. & McQuinn B. 2015. Conservation's blind spot: The case for conflict transformation

in wildlife conservation. *Biological Conservation* 178, 97–106.

Mukherjee S., Appel A., Duckworth J.W., Sanderson J., Dahal S., Willcox D.H.A., Herranz Munoz V., Malla G., Ratnayaka A., Kantimahanti M., Thudugala A., Thaug R. & Rahman H. 2016. *Prionailurus viverrinus*. The IUCN Red List of Threatened Species 2016: e.T18150A50662615. <http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T18150A50662615.en>

Redpath S. M., Young J., Evely A., Adams W. M., Sutherland W. J., Whitehouse A. & Gutierrez R. J. 2013. Understanding and managing conservation conflicts. *Trends in ecology & evolution* 28, 100–109.

Sathiyaselvam P. & Eswar Satyanarayana J. 2016. Status of Fishing Cat and Indian Smooth-coated

Otter in Coringa Wildlife Sanctuary. EGREE Foundation, An initiative of Gol-UNDP-GEF-GoAP (EGREE) Project, Kakinada.

WPA 1972. <http://envfor.nic.in/legis/wildlife/wildlife2s1.pdf>, accessed on 1 April 2019.

Supporting Online Material Figures F1–F4 and V1–V3 are available at www.catsg.org.

¹ Leo Foundation, The Netherlands

*kolipaka.s.s@gmail.com

² PhD Researcher, Wildlife Institute of India, India

³ Conservation Practitioner, Bhagrol Basa Fishing Cat Project, India

⁴ School of Natural and Environmental Sciences, King's Road, Newcastle University, Newcastle, UK