# FINAL REPORT

## 2022

**PREPARED BY**

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**SUBMITTED TO**

Rufford Foundation

# FISHING CAT: STATUS AND ITS CONSERVATION IN WETLANDS OF CHITWAN NATIONAL PARK, CENTRAL NEPAL

**September 2022**

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# ACKNOWLEDGEMENTS

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# ACRONYMS

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|---|---|
| BNP | Baridya National Park |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CNP | Chitwan National Park |
| DNPWC | Department of National Park and Wildlife Conservation |
| IUCN | International Union for Conservation of Nature |
| KTWR | Koshi Tappu Wildlife Reserve |
| PNP | Parsa National Park |
| SNP | Shuklaphant National Park |
| UNSECO | United Nations Educational, Scientific and Cultural Organization |

# 1. INTRODUCTION

The fishing cat, scientifically known as *Prionailurus viverrinus* is one of the twelve felid species found in Nepal (Lamichhane et al., 2016). Their resemblance is to that of a domestic cat, however, they are larger in size and have two stripes on the cheeks and two above the eyes which run along its forehead. It is also one of the species that is entirely dependent on wetlands, preying on fish, amphibians, reptiles, birds, small poultry animals, rodents, insects, and scavenges on carcasses of larger animals (Mishra et al., 2021). Along with wetlands, fishing cats also reside on marshy land, streams, creeks, grasslands, and swamps (Timilsina et al., 2021).

Globally, fishing cats are found to inhabit wetland and marshy lowlands of eastern Pakistan, India, Nepal, Sri Lanka, Thailand, Cambodia, Vietnam, and Bangladesh (Mishra et al., 2021). In Nepal, their distribution occurs mainly in the lower Terai with the presence of high biodiversity and large wetland areas. So far, the species are documented in several areas inside Chitwan National Park (CNP), Bardia National Park (BNP), Parsa National Park (PNP), Koshi Tappu Wildlife Reserve (KTWR), Shuklaphanta National Park (ShNP), Jagadishpur reservoir, Ghodaghodi Lake (Suwal and Verheugt, 1995). Other Ramsar sites in the plains are also supposed potential habitats for the fishing cat but limited studies have been conducted on the species distribution and ecological characteristics in Nepal (Mukherjee et al., 2012). Jnawali et al. (2011) estimated that an average of 150 to 200 fishing cats thrive in the Terai region of the country.

Moreover, the species have been listed in the "Vulnerable" category of the IUCN red list due to its population decline resulting from the shrinkage of wetland habitat and widespread indiscriminate killings (Chowdhury et al., 2015). In Nepal, the species is still not given a protected status like other endangered mammalian species like Bengal Tiger and One-horned Rhinoceros despite their low population (Mishra et al., 2021). Furthermore, the actual status of fishing cat within and outside of the CNP is also not

addressed properly thus causing great hindrance in the planning and implementation of conservation measures for the species.

## 2. STATEMENT OF PROBLEM

The first research on fishing cats in CNP was a radio-telemetry study in 1980, during which 4 fishing cats were radio-collared. This study defined the habitat of fishing cat for the first time in Nepal (Mishra, 2020). Then in 2011, Sagar Dahal and Dibya Raj Dahal set a live trap in CNP and captured 2 individuals (Dahal and Dahal, 2011). In 2012, Rama Mishra conducted a camera trap survey which led to capturing images of 5 fishing cats near lakes and swamps surrounded by dense tall grasses (Mishra et al., 2018). However, all of those studies inside protected areas have been archaic and require fresh or new ground data. Whereas, the government conducts tiger count surveys regularly at an interval of 4 years. Currently, 93 tigers are expected to inhabit the CNP and 235 tigers are present in the country (DNPWC, 2020).

On the other hand, fishing cats are one of the least known species in Nepal whose population is expected to be less than that of tigers and are on the verge of extinction due to several anthropogenic activities (Sunquist and Sunquist, 2002). IUCNs 'The Status of Nepal's Mammals: The National Red List Series' also mentions the primary threats to a fishing cat as habitat loss due to wetland pollution, wetland destruction and over-exploitation of the fish population (Jnawali et al., 2011).

Moreover, the country lacks accurate information about the status and distribution of the fishing cat population in wild. On top of that, very limited research and conservation effort have been given by concerned authorities regarding the fishing cat species. Those limitations have caused a great hindrance in the conservation of these "Vulnerable" species. Additionally, most of the people living close to the fishing cat habitat are also unaware of the existence of fishing cat as they are often mistaken for other domestic/wild cat species due to a lack of its knowledge.

# 3. OBJECTIVE

1. Identify the presence of fishing cat within wetlands of the Kasara sector of CNP
2. Understand the perception of local community people towards the fishing cat species
3. Strengthen the capacity of local community people for long term monitoring
4. Carryout awareness program to educate people about the status of the fishing cat and their role in the habitat conservation of the species

# 4. STUDY AREA

The study was conducted in the buffer zone and wetland area of the Kasara sector, Chitwan National Park (CNP). CNP is also considered one of the major biological hotspots of different wildlife species. CNP is one of the country's first national parks to be established in 1973 and enlisted as a world heritage site by UNESCO in 1984 for having a diverse ecosystem of international significance (DNPWC, 2020). Also, the park encloses wetland (Beeshazar and associated lakes) areas within its buffer zone which are internationally recognized under the RAMSAR convention 2003.

Furthermore, considering the effective management of the park, an entire national park, and its buffer zone is divided into four administrative sectors: Northern (Kasara), Southern (Madi), Eastern (Sauraha), and Western (Amaltari) (Lamichhane et al., 2019). In order to carry out research and conservation work more effectively and successfully with the available resources, the study area primarily focused on the Northern (Kasara) sector of the park. This sector is considered as one of the good fishing cat hotspots of CNP due to the presence of a higher number of shallow lakes and water resources.

The study area is located at 84.355896 Longitude and 27.530162 Latitude covering 221 sq km area and connected to 5 other buffer zones such as Meghauli, Kerunga, Kalabanjar, Barandabhar, Patihani. Moreover, the entire national park is globally considered one of the top natural sites rich in flora and fauna with the presence of 75 mammal species, 643

species of birds, 56 species of herpetofauna, 121 species of fish, 206 species of butterfly and 422 plant species (DNPWC, 2020).
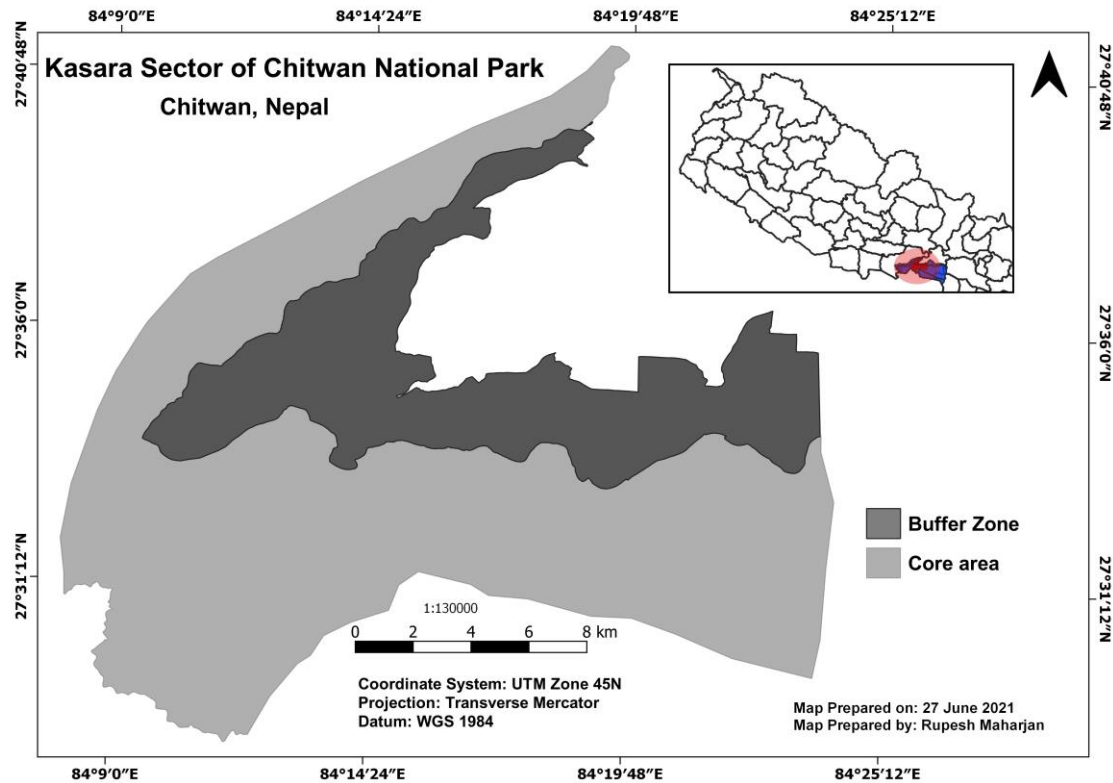


*Figure 1. Map showing the Kasara Sector of Chitwan National Park*

# 5. METHODOLOGY

## 5.1. Reconnaissance Field Survey

Initially, preliminary sign surveys and informal interviews with park authorities, local fishermen, and wildlife technicians of CNP were carried out to identify the potential habitats of fishing cats to centralize the research area. The areas of presence and sightings encountered were thoroughly inspected and marked during the reconnaissance survey. Similarly, the presence data of the species from various published and unpublished sources were collected and then a participatory study area map was prepared.

## 5.2. Camera trap study

Based on the information collected during the reconnaissance survey, a camera trap study was carried out from the month of April 2021 to the month of June 2021 to survey the occurrence of fishing cats. The study area was divided into 2*2 km$^2$ grid cells where 10 pairs of trail cameras were used. Each pair of the camera were installed at a distance of 7 m apart within each cell. Those pairs of cameras faced each other at 30 - 45 cm above the ground to capture the photograph of a fishing cat at its height and the cameras were installed in each study grid.



Photo Credit: Bir Bahadur Kumal

*Figure 2. Image showing the positioning of Trail camera*

## 5.3. Sign survey:

Sign survey method was used for collecting presence data of fishing cats in the region. This method was opted along with camera traps for the study of fishing cat habitats, and to accurately detect the presence of fishing cats in the region. The survey was carried out based on line transects that were aligned along with rivers, lakes, and other wetland

areas. The presence of fishing cat within the study area were determined based on the signs of the species such as pugmark, and scat and based on these signs, camera traps were laid.

## 5.4. Questionnaire survey:

A questionnaire survey and focal group discussion were conducted in the buffer zone lying close to the fishing cat habitat within CNP from March to September 2021. The surveys targeted local fishermen in their private lands and other local people who were directly or indirectly dependent on the wetland of CNP. The initial surveys targeted the nature and cause of human fishing cat conflict and identified potential solutions for conflict minimization. The surveys were also used to assess the level of knowledge on fishing cats in the local community. A post - questionnaire survey was also conducted within the project area as a monitoring phase after the successful completion of an awareness campaign. This is to view the increased understanding of fishing cat species by the local community people living close to the fishing cat habitat after the implementation of the awareness campaign.

## 5.5. Education and Awareness Program:

A conservation awareness program was carried out in more than 9 schools and buffer zone communities of the region through the means of posters and multimedia presentations to educate the younger generations about the status and conservation needs of the fishing cats. Adult men and women were also included in the awareness program to increase the awareness level in the community. Furthermore, fishing cat monitoring and conservation training were given to local community people, from different occupational and ethnic communities, to strengthen their capacity and to encourage them to be citizen scientists and gain their support for long term monitoring and conservation of the fishing cat species.

# 6. RESULT

## 6.1. Camera trap Survey

The camera trap conducted in the Kasara region of CNP resulted in capturing fishing cat in three different locations, which were more than 2km far from each other. All of those images were captured within the wetland of the Kasara sector of Chitwan National Park (CNP) near the Rapti river. The images of captured fishing cats are shown below:
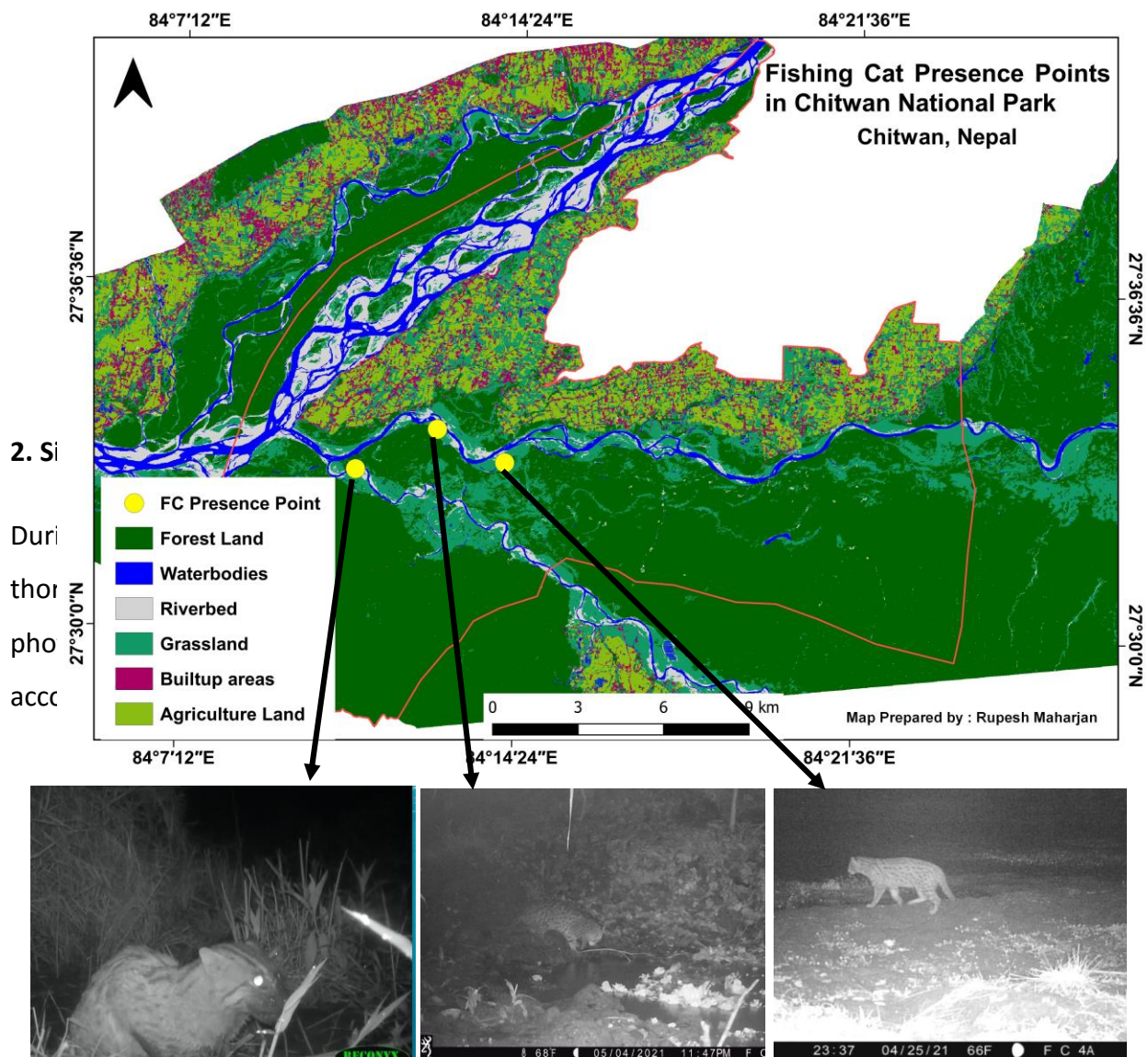


*Figure 3. Image showing the position of fishing cat presence points*

## 6.2 Sign survey

During the transect walk, potential habitat areas within the park and buffer zone of CNP were thoroughly scanned for signs of pugmark, and scat. Every sign encountered was recorded as a photograph with an object placed adjacent to the sign. The signs were first confirmed by the accompanying wildlife technician.



Photo Credit: Rupesh Maharjan

*Figure 4. Image showing the pugmark of fishing cat*

## 6.3. Questionnaire survey

A total of 146 respondents have been interviewed, who were mostly local farmers (47%), students (34%), fishing communities (fish farmers & local fisherman) (8%), and park officials (11%), to share information on the status of fishing cat species and its conservation in CNP. Among the respondents, 70% were male and the rest 30% were female. During the first survey, only 20% of the respondents could easily identify fishing

cats, 15% had to be shown photos of fishing cats and 65% said they had never seen fishing cats.

Among those who had seen fishing cats, 76% had seen them in the buffer zone area (farms), and 24% had seen them inside the park. These sightings are more frequent during the season when harvesting of wheat and barley takes place

Based on the perception of respondents, the present potential threat to fishing cats in Kasara is habitat loss (33%), competition for food (25%), illegal poaching and killing (13%), and excessive fishing (12%). The remaining 16% didn't respond to any threats as they were unaware of the status of fishing cats. Along with the threats, 15% of respondents have seen and heard about the human-fishing cat conflict, and the major reason was livestock killing of farmers (47%), fish hunting from fish farms (16%), and 37% responded to both livestock and fish hunting for the local fish ponds as the conflict.
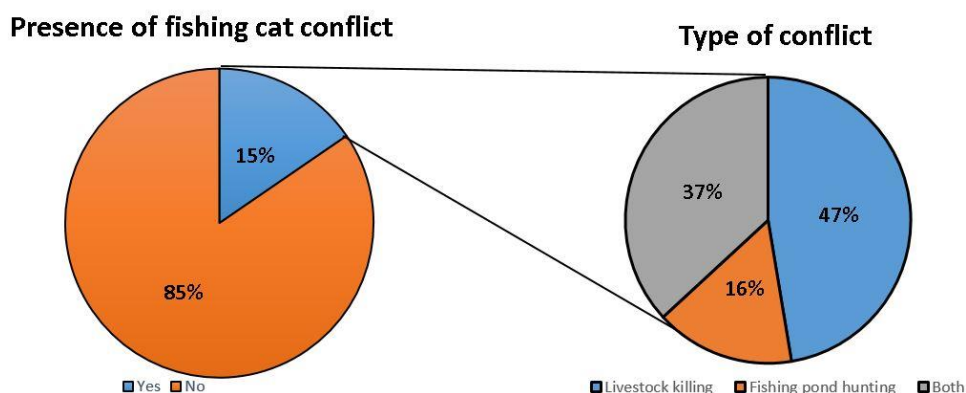


*Figure 5. Pie chart showing the presence of fishing cat conflict and type of conflict*

On the willingness for the conservation of fishing cats, more than 52% responded with a positive aspect to the importance of conservation, 16% thinks the conservation of fishing cat species are not required and 32% didn't know if its conservation was important or not. But on further question, if any of their livestock or fishes would be killed by the fishing cat; those previously advocating on conserving fishing cats decreased to 47%.
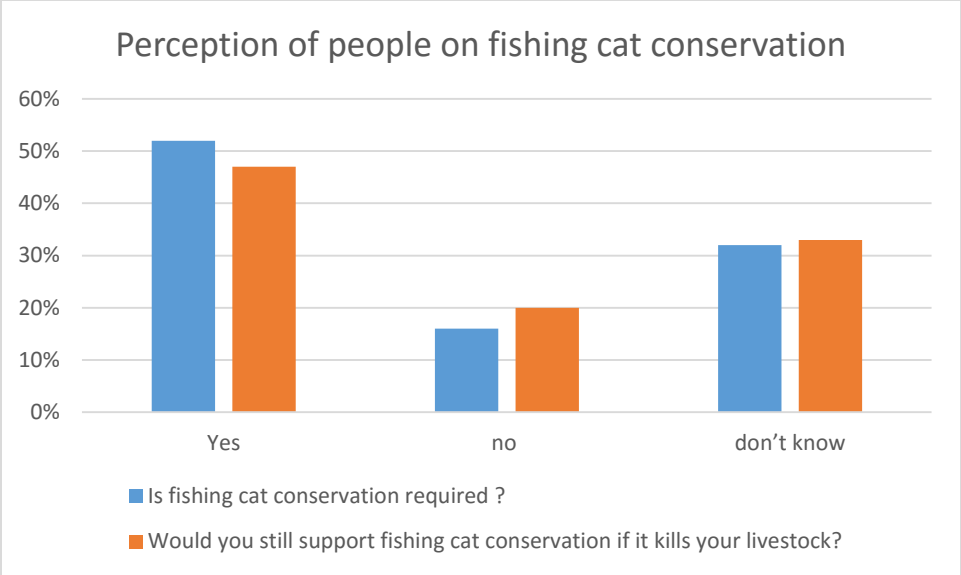
*Figure 6. Bar chart showing the perception of people on fishing cat conservation*

After running awareness campaigns in the community, 104 respondents were interviewed during the post-survey. Among those respondents, around 72% of people considered that the conservation of fishing cat species is important while only around 12% of people believes that fishing cat conservation is not required and remaining 16% didn't know if its conservation was important or not.



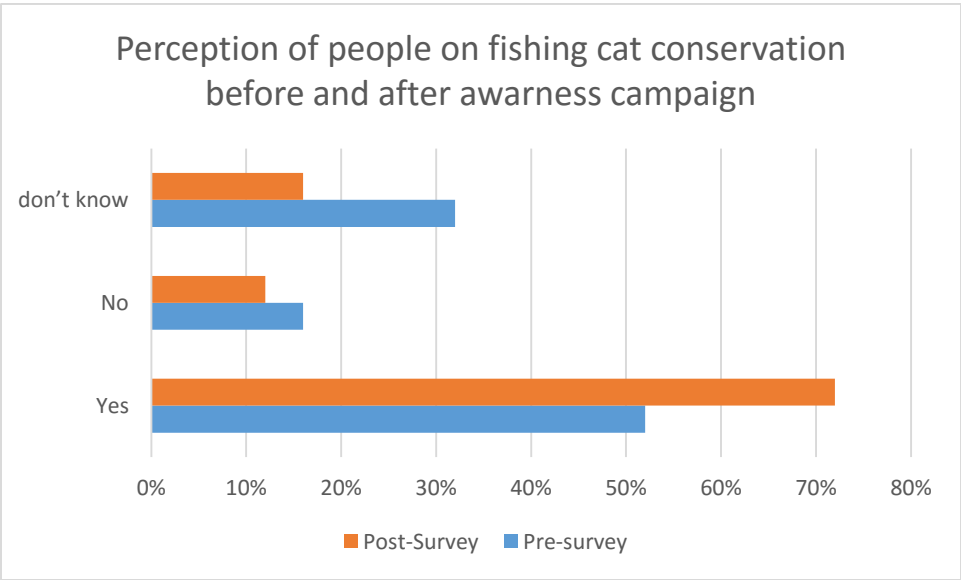*Figure 7. Perception of people on fishing cat conservation before and after awareness campaign*

Photo Credit: Nikias Maharjan

*Figure 8. Questionnaire survey*

## 6.4. Education and Awareness programs

Awareness programs for the conservation of fishing cats were carried out within the schools and communities of the project area. A banner was prepared in the Nepali language that highlighted the gist of the campaign i.e. Conservation of Fishing Cat. These banners were placed in viewable areas during the awareness programs.

We have carried out awareness programs in 10 community schools where more than 300 students participated. School-level conservation awareness programs were chosen because students often play an important role in conveying information and convincing their parents and neighbors toward species conservation. Presentation and lecture on the importance of ecology, potential threat, and identification traits were showcased to the students followed by exhibiting a poster. The poster included major threats to this species and necessary actions to be taken to conserve its habitat.

*Figure 9. Awareness program in Shree Kajiman Secondary School*

At the community level, awareness campaigns were conducted in the areas near the buffer zone of Kasara. The participants mostly consisted of fish farmers, cattle herders, buffer zone committees, community forest users groups and relevant stakeholders. An oral presentation was given to local community people on the importance of fishing cat and its habitat conservation. They were briefed on adapting to alternative measures to protect their pond and change agricultural practices by using less pesticides and more organic fertilizers. Posters were also distributed at the campaigns for more engagement of the community members. Through the conduction of awareness campaigns at the school and community levels, the effort of the project has reached more than 500 households directly and indirectly.

*Figure 10. Carrying out door to door awareness campaign*

## 6.5. Strengthening capacity of local personnel

As a part of creating awareness within the local communities, the project has given wildlife monitoring and conservation training to more than 25 personnel from different occupational backgrounds (local wildlife technicians, local community leaders and local wildlife guides) to motivate and strengthen their capacity for a long term monitoring and conservation of the species as a citizen scientist. They were also trained in handling GPS and camera traps for monitoring the fishing cat species. Similarly, they were also trained to identify the species by the means of signs such as pugmarks.

*Figure 11. Fishing cat monitoring and conservation training program*

# 7. CONCLUSION

The fishing cat is one of the elusive species which is tricky to be directly seen in the wild. In the world, the population of these species are declining due to its habitat loss through the excessive conversion of wetland areas into agricultural lands. Besides that, the research and conservation of fishing cat species have always been undermined, especially in the buffer zone of Chitwan National Park, due to the fact that their existence and its conservation need have been only known to limited people. This project, however, has helped to understand the current status of fishing cat within and outside of the protected areas as well as able to gain the trust and support of local community people for future fishing cat conservation activities.

# 8. WAY FORWARD

Fishing cat is one of the highly neglected and undermined species in comparison to other large endangered mammalian species. It seems that very less to no effort has been given to the conservation of this particular species by local communities and authorities surrounding the areas of CNP. It is primarily caused due to lack of awareness about the existence and conservation of the fishing cat within those localities. So more fishing cat research and conservation awareness programs are still needed to be carried out in the larger areas of CNP. This will not only aware local communities of the need for fishing cat conservation but also will help us to further gain community level support in our long term fishing cat conservation activities.

In order to conserve and increase the population of fishing cat. This fishing cat conservation project will continue its conservation effort by collaborating with local stakeholders, conservation partners and fishing cat conservation groups. Based on the current understanding of fishing cat in CNP, still more awareness of fishing cat conservation is required. So in the coming days, we will be extending our conservation work not only in the Kasara sector of CNP but also in other parts of the park as well.

# 9. RECOMMENDATION

The following recommendations have been transpired from this project which will help in the conservation of fishing cats in near future.

- **Mass awareness**: Use of different mediums to increase the awareness at an individual level through radio jingles, newspapers, articles, posters, etc.
- **Community-level intervention**: Enhance the capacity of local communities through training and opportunities to participate in the local conservation activities which will guarantee long-term monitoring and conservation of the fishing cat species.
- **Government level intervention:** The Government of Nepal should also provide special attention to fishing cat conservation.
- **Adjacent communities**: Awareness campaigns needs to be carried out among other adjacent communities, living close to the fishing cat habitat, as people have not fully understood the significance of fishing cat and its importance for conservation.

# REFERENCES

Aryal, C., Ghimire, B., and Bhattarai, B. (2018). Small cats in Nepal: Conservation status of felinae sub-family in the country. Nepalese Journal of Environmental Science, (6), 75-80

Crampton, L. (2021). The Fishing Cat: An Interesting and Vulnerable Animal in Asia. Available at: The Fishing Cat: An Interesting and Vulnerable Animal in Asia - Owlcation

Dahal, S., and Dahal, D.R. (2011). Trapping of fishing cat in Chitwan National Park, Nepal. Catnews55.

DNPWC b. (2020). Chitwan National Park. http://www.dnpwc.gov.np/en/conservation-areadetail/78/. Department of National Parks and Wildlife Conservation.

Jnawali, S. R., Baral, H. S., Lee, S., Acharya, K. P., Upadhyaya, G. P., Pandey, M., Shrestha, R., Joshi, D., Lamichhane, B. R., Griffiths, J., Khatiwada, A. P., Subedi, N. and Amin, R. (2011). The status of Nepal's mammals: The National Red List Series. Department of National Parks and Wildlife Conservation, Kathmandu, Nepal

Lamichhane, B. R., Kadariya, R.., Subedi, N., Dhakal, B. K., Dhakal, M., Thapa, K, & Acharya, K. P. (2016). Rusty-spotted Cat: 12th cat species discovered in Western Terai of Nepal. Cat News, 64, 30-36

Lamichhane, B. R., Persoon, G. A., Leirs, H., Poudel, S., Subedi, N., Pokheral, C. P., Bhattarai, S., Gotame, P., Mishra, R., & de Iongh, H. H. (2019). Contribution of buffer zone programs to reduce human-wildlife impacts: the case of the Chitwan National Park, Nepal. Human Ecology, 47(1), 95-110.

Mishra, R., Basnet, K., Amin, R., & Lamichhane, B. R. (2018). Fishing Cat Prionailurus viverrinus Bennett, 1833 (Carnivora: Felidae) distribution and habitat characteristics in Chitwan National Park, Nepal. Journal of Threatened Taxa, 10(11), 12451-12458

Mishra, R. (2020). Save Tigers but do not forget Fishing Cats. Nature Khabar. Available at: http://naturekhabar.com/en/archives/15402

Mishra, R., Gautam, B., Kaspal, P., & Shah, S. K. (2021). Population status and threats to fishing cat Prionailurus viverrinus (Bennett, 1833) in Koshi Tappu Wildlife Reserve, Eastern Nepal. Nepalese Journal of Zoology, 5(1), 13-21

Mukherjee, S., Sanderson, J., Duckworth, W., Melisch, R., Khan, J., Wilting, A., Sunarto, S. and Howard, J. G. (2010). Prionailurus viverrinus. The IUCN Red List of Threatened Species. 2010: e. T18150A7673993.Myers, P., Espinosa, R., Parr, C. S., Jones, T., Hammond, G. S. and Dewey, T. A. (2006). The animal diversity web. (http://animaldiversity.org).

Mukherjee, S., Appel, A., Duckworth, J.W., Sanderson, J., Dahal, S., Willcox, D.H.A., Herranz Muñoz, V., Malla, G., Ratnayaka, A., Kantimahanti, M., Thudugala, A., Thaung, R. &

Rahman, H. 2016. Prionailurus viverrinus. The IUCN Red List of Threatened Species 2016: e.T18150A50662615. https://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T18150A50662615.en. Accessed on 14 January 2022.

Sunquist, M. and F. Sunquist. (2002). Wild Cats of the World. University of Chicago Press. Pages 241-245.

Suwal, R. N. and Verheugt, W. J. M. (1995). Enumeration of the mammals of Nepal, biodiversity profiles project technical publication No. 6. Department of National Parks and Wildlife Conservation, Ministry of Forests and Soil Conservation, Kathmandu, Nepal

Timilsina, S., Mishra, R., Adhikari, A., Gautam, S., & Neupane, B. (2021). Status, current distribution and threats to the Fishing cat Prionailurus viverrinus (Bennett, 1833) in Nepal. Journal of Animal Diversity, 3(2), 18-25