

This report will be made public. If it contains confidential or sensitive information, please also provide a revised report for sharing with the public.

Section I. Project Information	
Project Title: Parsa National Park: the saviour of tigers.	
Grantee Organisation: Zoological Society of London	
Location of project: Parsa National Park and its extended area.	
Size of project area (if appropriate): 128.39 Sq. Km	No of tigers in the project area, giving evidence & source: 18 in Parsa National Park (PNP) (National Tiger Census 2018) and 7 tiger cubs (ZSL monitoring 2018-2021) camera trapped towards east of PNP.
<p>Partners: <i>(Please give details of partners, including communities, academic institutions, etc. for this project.</i></p> <p>Department of National Parks and Wildlife Conservation (DNPWC)</p> <p>DNPWC is the main government authority providing oversight for conservation and management of wildlife in Nepal. It is responsible for the overall management of Nepal's Protected Areas (PA) including the buffer zones. ZSL has an excellent professional relationship with the DNPWC, having had a working MoU with them since 2014 and renewed for five years in 2019. Through DNPWC, ZSL also has a close working relationship with the PA managers at PNP. The DNPWC, through Programme Coordination Committee (PCC), facilitates the implementation of project activities and is responsible for overall monitoring and evaluation of the project. The proposed project has been formulated under the guidance of the DNPWC and the required permission has been obtained. The project will help DNPWC gain valuable lessons to improve tiger habitat and mitigate Human Tiger Conflict (HTC) in other tiger-bearing PAs of Nepal.</p> <p>PNP</p> <p>In 1984, PNP was gazetted as a wildlife reserve, primarily aiming to preserve the wild Asian elephant and their remaining habitat including other varieties of fauna. In 2015, the reserve area was extended to 627.39 sq.km from 499 sq. km and in 2017 the status was upgraded from a wildlife reserve to a National Park. PNP plays a vital role in achieving the goals and objectives of PA management regimes in Nepal as it provides critical habitat for endangered species including the tiger and transboundary connectivity with Chitwan NP and Valmiki Tiger Reserve in India. It is also part of the Terai Arc Landscape (TAL), which is a globally important landscape for tiger conservation. The previously established Project Management Unit (PMU) at PNP, chaired by the Chief Conservation Officer with members of ZSL, had facilitated the implementation of the project activities. The members of the PMU are responsible for coordination, facilitating project activities, monitoring progress, and reporting to the PCC.</p>	

Mithila Wildlife Trust (MWT)

MWT is non-profit non-governmental organisation established by a group of committed professional nature lovers, social workers, and volunteers in 2013, registered with the District Administration Office, Dhanusha, Nepal and affiliated with Social Welfare Council, Kathmandu, Nepal. MWT has been organizing and strengthening capacities of local volunteers for planning, implementing, and monitoring social development programmes, thereby facilitating their own and their community's welfare through sustainable and wise use of natural resources. The trust has its office at Mithila Bihari Municipality-3 (Mithileshwor) Dhanusha, Province 2, Nepal.

Project Contact Name: *(main contact via email)*

Hem Sagar Baral

Email: hem.baral@zsl.org

Actual start date of project: 1 February 2021

Reporting period: 1 February 2021 – 31 January 2022

Please ensure that your report relates to the objectives and activities detailed in your proposal and log frame. Please include results data in Section II and Section III.

Section II. Project Results

Long Term Impact: *(How has this work contributed to the vision and long-term impact that your project aims to achieve?)*

ZSL Nepal has implemented several tiger conservation projects in PNP and its buffer area since 2014. Through these, ZSL has supported PNP in achieving a nearly three-fold increment in its tiger population. It is important to secure this population's future in the PNP and beyond its boundaries. PNP's recently annexed 129 sq. km area (called PNP extension area; PNPea) provides a platform for the tigers to recolonize the eastern landscape, where they were extirpated from perhaps during the 1970s. WCCA has been instrumental in tiger conservation in PNP, particularly PNPea, supporting different tiger conservation projects. Despite the smaller scale intervention of this project in terms of location and activities, it nonetheless serves to continue the legacy of the previous projects, aiming to achieve ZSL's two long-term tiger conservation goals. The two goals are:

- i) Securing Chitwan-Parsa Complex's (CPC) role as a globally vital tiger stronghold which can continue to support an increased tiger population in a rapidly changing world; with high-quality habitat, local communities committed to its conservation, and connectivity to the wider landscape and
- ii) Securing vital connectivity between all tiger-bearing PAs in the Terai Arc Landscape (TAL).

To achieve these goals, this project dealt with one major objective: Grassland and wetlands are managed to secure high quality tiger habitat within PNP through evidence-based habitat mapping and tiger monitoring.

In accordance with this objective, current habitat patterns in the extension area of PNP was identified, which has supported PNP authorities to understand the existing habitat patterns within the area and promote habitat management based on the requirement for wildlife. Based on the habitat mapping results and its recommendation for habitat intervention sites, 20 ha of grassland was expanded, and a waterhole constructed within the extension area of PNP, which is expected to support growing number of residential and migratory wildlife. The habitat map can inform park managers on other important sites for intervention. Likewise, information on wildlife status gathered through hotspot monitoring has been useful for decision makers for developing pragmatic approaches towards better conservation outcomes.

Conservation Outcome: *(What are the actual changes that this project has achieved?)*

During the project implementation, a habitat map of the extension area of PNP was produced, covering approx. 128.39 km². This has helped to identify current habitat pattern in the extension area of PNP. Likewise, regular hotspot monitoring via camera traps has also improved park authorities' knowledge on dispersal and habitat use by tigers and other wildlife in the area. This year, a total of 25 species of mammals were recorded from the area.

Both these have enabled park officials and ZSL to identify strategic areas for intervention, the product of which was the recently managed 20 ha of grassland and a waterhole constructed in the extension area of PNP. This has created new habitat for wildlife, improving access to water, food, and cover, within PNP.

Summary of activities and achievements: *(Please provide a summary for use in our communication materials Max 300 words) (203 words)*

Through this project, different habitat types (Grassland 0.67%, Wetland 0.05%, Riverbed 13.25% Forest 86.03%) within the extension area of PNP were identified through a participatory GIS mapping process. Based on the knowledge gained through regular hotspot monitoring in the area and identified habitat needs within the park, ZSL provided technical and financial support to PNP for the expansion of 20 ha of grassland and the construction of a new waterhole at strategic locations. These locations had higher wildlife density and richness. The management of grassland intervention included grass cutting, removal of woody vegetation and invasive plant species, uprooting and management of trees. Furthermore, the newly supported waterhole (2.5 meters radius) in the extension area of the park is expected to promote year-round availability of water for wildlife. In a bid to conduct monitoring of tiger and prey population more systematically within in the extension area, the area was divided into 18 grid cells of a grid size 3kmX3km. 17 camera traps were laid in 16 grid cells with at least 1 in each grid cell. The preliminary camera trap result shows the evidence of 25 mammal species including endangered species like Bengal Tiger *Panthera tigris*, Asian Elephant *Elephas maximus*, Dhole *Cuon alpinus*.

Details of activities and results: *(Please give detailed narrative of the results of each objective & output. Please include measures for example patrol numbers and distances covered)*

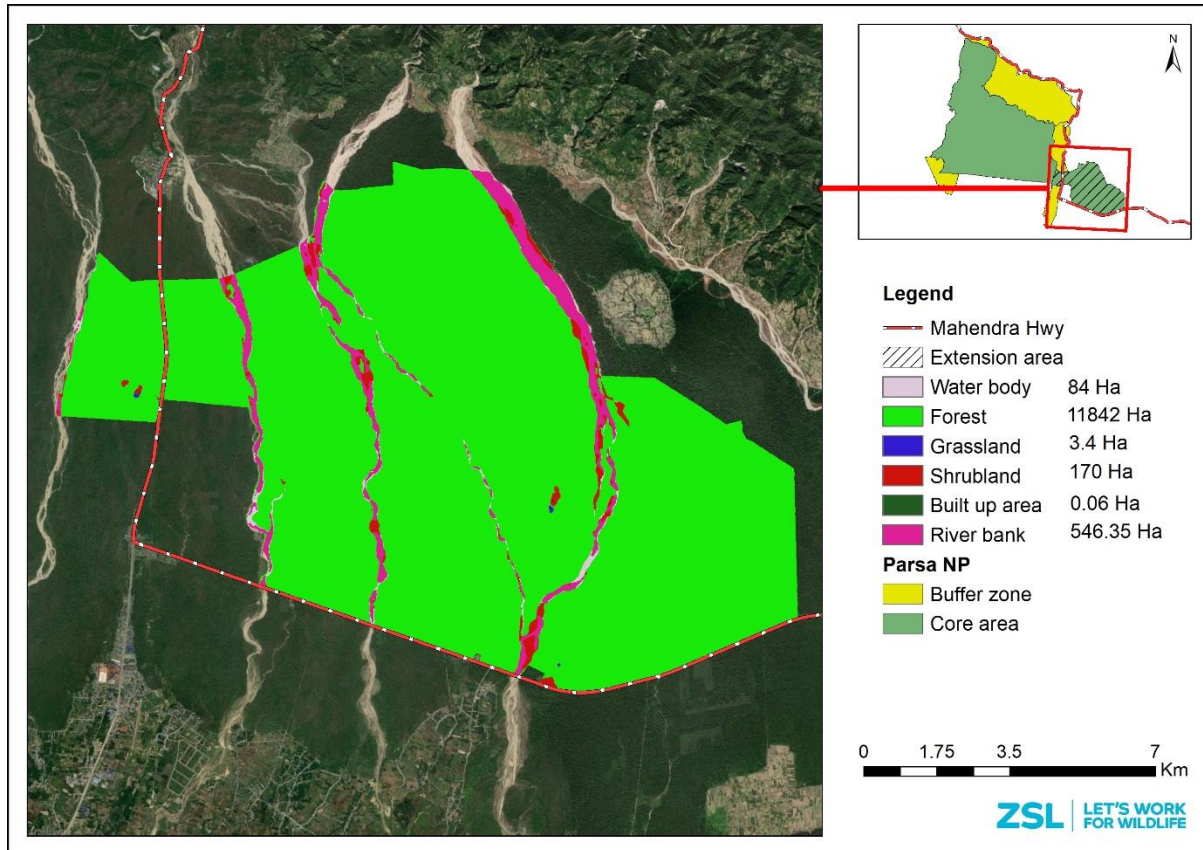
The project was given approval through the Project Coordination Committee (PCC) at DNPWC. Prior to the implementation of the project activities, a Project Management Unit (PMU) meeting was conducted. PMU is an established body between national parks and ZSL at the field level, that when required can hold a meeting and decide to implement project activities at the site. The Chief conservation officer of the park is the coordinator of the PMU followed by NTNC-BCC in charge and ZSL field in charge are its members. Park authorities, along with other stakeholders were informed about the project and its activities in detail in PMU meeting. The project activities were initiated after prior consultation with the park and other stakeholders.

Activity 1.1 Conduct habitat mapping to identify the key habitat types of the extended area of PNP

A one-day workshop on the identification and delineation of major habitat types of extension area of PNP was conducted in March 2021, at the PNP headquarter. Altogether 11 participants from PNP and ZSL Nepal attended the workshop which was led by the Chief Conservation Officer of PNP. The workshop was focused on the delineation of habitat types using appropriate methods and field inspection that will help PNP authorities for spatial planning and appropriate habitat management interventions in the future to secure and expand the key habitat of tigers and prey population.

Based on the project objectives and discussion made in the habitat mapping workshop, a GIS based approach was selected for the identification and classification of habitat types. For habitat classification, satellite data of 2015 was used which was further processed by using ArcGIS for identification of the habitat classes. The map was then produced (see figure 1) using the same GIS software. The forest area of the extended area of PNP is estimated to be 11842 ha or 86.03% of the total area which comprises *Shorea robusta* Sal Forest (including degraded Sal Forest), *Cassia fistula*, and riverine species such as *Dalbergia sissoo* and *Acacia catechu* in the stream banks. Similarly, riverbed covers 13.25%, bushes/grass 0.67% and water body 0.05% of the total area. Field verification of the map was carried out in the second half of the project period. All the reports were also shared, and brief explanation was given to the park authority regarding the distribution of habitat types within the extension area of the park.

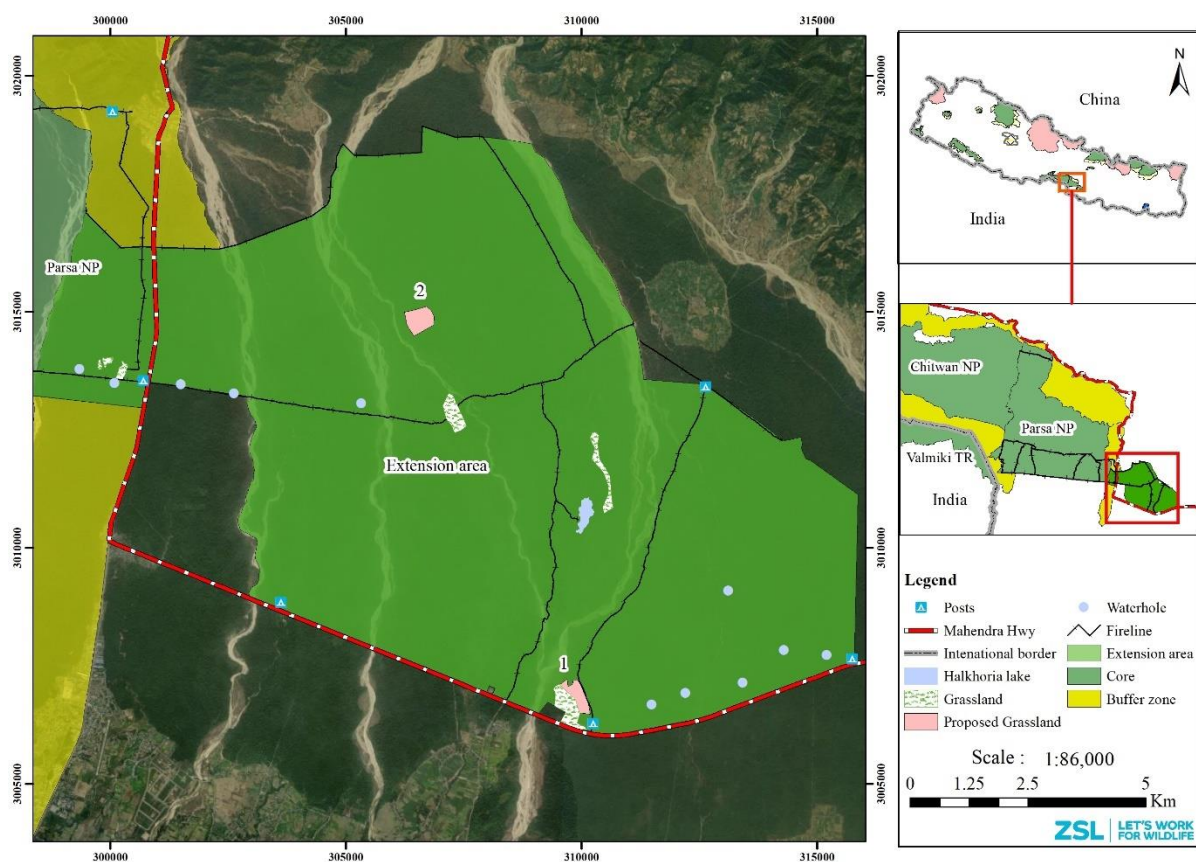
Figure 1: The habitat map of the extension area of PNP



Activity 1.2 Support PNP to manage 20 ha of grassland in an extended area

In January 2022, technical and financial support was provided for the expansion of 20 ha of grassland habitat based on the findings of habitat mapping, monitoring results and recommendation from park authorities. Out of the two proposed sites (shown in figure 2) for grassland management, Sahajnath area (proposed site 1) located in south central part of the extension area (27°10'7.65"N and 85° 4'46.53"E) which is approximately 500m north-east from Sahajnath Guard Post was selected for the management intervention. This area acts as an important corridor between PNP and southern connected forests outside protected area and is one of the key habitats of extension area currently supporting the increasing numbers of tigers and their prey base. The management intervention includes grass cutting, removal of woody vegetation and invasive plant species, uprooting trees, and management of those trees. A total of approximately 20 hectares has been cleared and effectively managed.

Figure 2: (Top) Proposed sites are shown in the map. (Bottom) Grassland management completed.

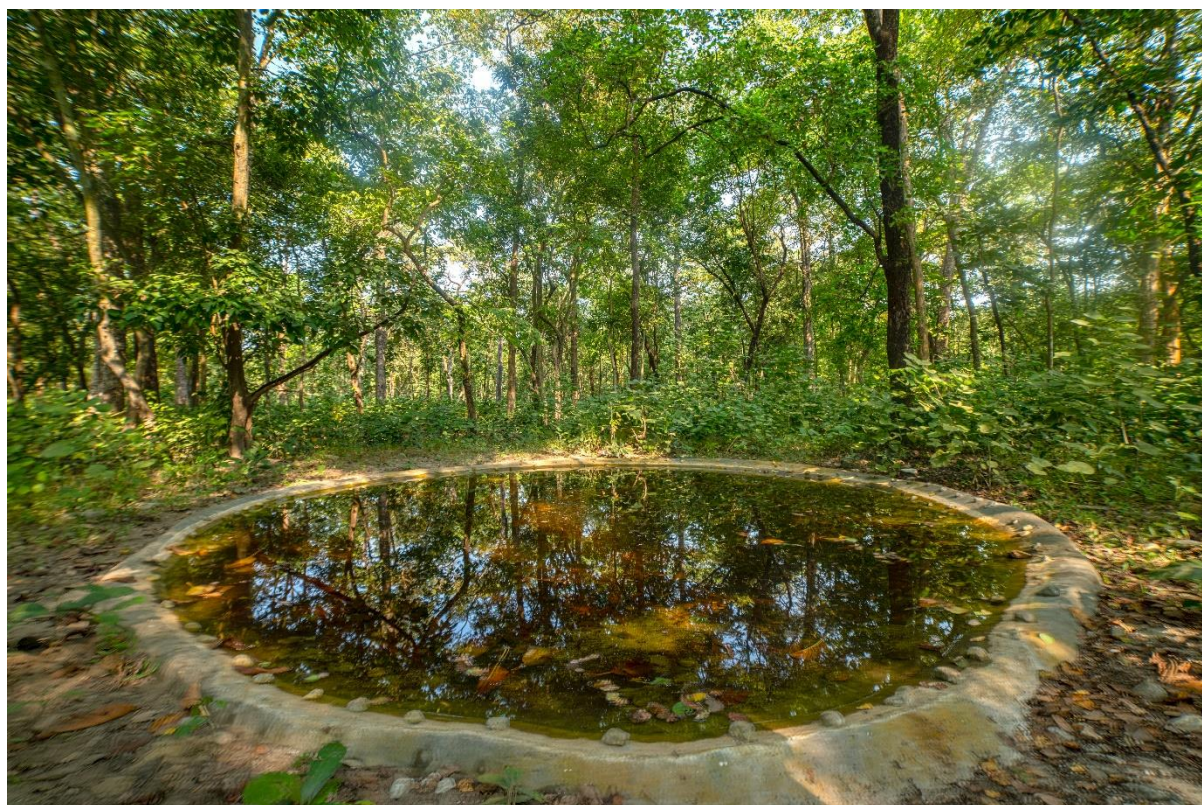


Activity 1.3 Support PNP to construct and manage one new waterhole in an extended area

In October 2021, we have supported to construct one new waterhole at a strategic location in the extension area of the park based on habitat mapping in the area. The waterhole is in a circular shape of a radius of 2.5 m. The Park authorities believe that the artificial pond will serve as a year-round

source of water for wildlife. The pond is located at a site which is approx. 1 km north from the park headquarter, Aadhavar.

A photo of a newly constructed artificial waterhole in an extension area of PNP is given below:



Activity 1.4 Conduct hotspot/dispersal monitoring in an extended area of PNP throughout the project period

At the beginning of the project from February to mid-June 2021, 7 remotely activated cameras were deployed in 7 different strategic locations. Later from July 2021, the extension area was divided in 18 grid cells of 3km x 3km grid size for systematic monitoring and to maximize the coverage of monitoring. Out of 18 grid cells, 16 grid cells were continuously monitored, placing at least one camera trap in each grid cell and 2 grid cells were left due to inaccessibility. All the camera trap stations were selected based on real time SMART patrolling observations, experiences of PNP patrol team at site and a quick reconnaissance survey that provided enough information of a place where promising signs of tiger's and other wildlife were observed. Altogether >16,000 photographs were obtained throughout the monitoring period.

A total of 25 mammal species were captured on camera traps during the monitoring period. Surprisingly, tigers were captured in all 16 camera stations indicating PNP extension area as a good recovery site for tigers. A checklist of mammals recorded during monitoring is listed in Table 1 with their IUCN and national status.

S. N.	Common Name	Scientific Name	Global Status	National Status	Remarks
1	Common palm civet	<i>Paradoxurus hermaphroditus</i>	LC	LC	
2	Nilgai	<i>Boselaphus tragocamelus</i>	LC	VU	
3	Common leopard	<i>Panthera pardus</i>	VU	VU	
4	Indian grey mongoose	<i>Herpestes edwardsii</i>	LC	VU	
5	Four-horned antelope	<i>Tetracerus quadricornis</i>	VU	DD*	
6	Honey badger	<i>Mellivora capensis</i>	LC	EN	
7	Indian crested porcupine	<i>Hystrix indica</i>	LC	DD	
8	Bengal fox	<i>Vulpes bengalensis</i>	LC	LC	
9	Jungle cat	<i>Felis chaus</i>	LC	LC	
10	Large Indian civet	<i>Viverra zibetha</i>	LC	NT	
11	Leopard cat	<i>Prionailurus bengalensis</i>	LC	VU*	
12	Masked palm civet	<i>Paguma larvata</i>	LC	LC	
13	Rhesus macaque	<i>Macaca mulatta</i>	LC	LC	
14	Sambar deer	<i>Rusa unicolor</i>	VU	VU	
15	Spotted deer	<i>Axis axis</i>	LC	VU	
16	Terai grey langur	<i>Semnopithecus hector</i>	NT	LC	
17	Bengal tiger	<i>Panthera tigris tigris</i>	EN	EN*	
18	Wild boar	<i>Sus scrofa</i>	LC	LC	
19	Asian elephant	<i>Elephas maximus</i>	EN	EN*	
20	Gaur	<i>Bos gaurus</i>	VU	VU	
21	Dhole	<i>Cuon alpinus</i>	EN	EN*	
22	Golden jackal	<i>Canis aureus</i>	LC	LC	
23	Crab-eating mongoose	<i>Herpestes urva</i>	LC	LC	
24	Indian hare	<i>Lepus nigricollis</i>	LC	LC	
25	Striped Hyena	<i>Hyaena hyaena</i>	NT	NT	

(Note: LC= Least Concern, DD= Data Deficient, VU= Vulnerable, NT= Near Threatened, EN= Endangered, *= Protected under NPWC Act, 2029)

Some of the photos of mammal species triggered on remotely activated cameras are given below:



Bengal Tiger 1



Bengal Tiger 2



Bengal Tiger 3



Bengal Tiger 4



Bengal Tiger 5



Bengal Tiger 6



Bengal Tiger 7



Bengal Tiger 8



Bengal Tiger 9



Bengal Tiger 10



Leopard I



Leopard 2



Indian Bison



Asian Palm Civet



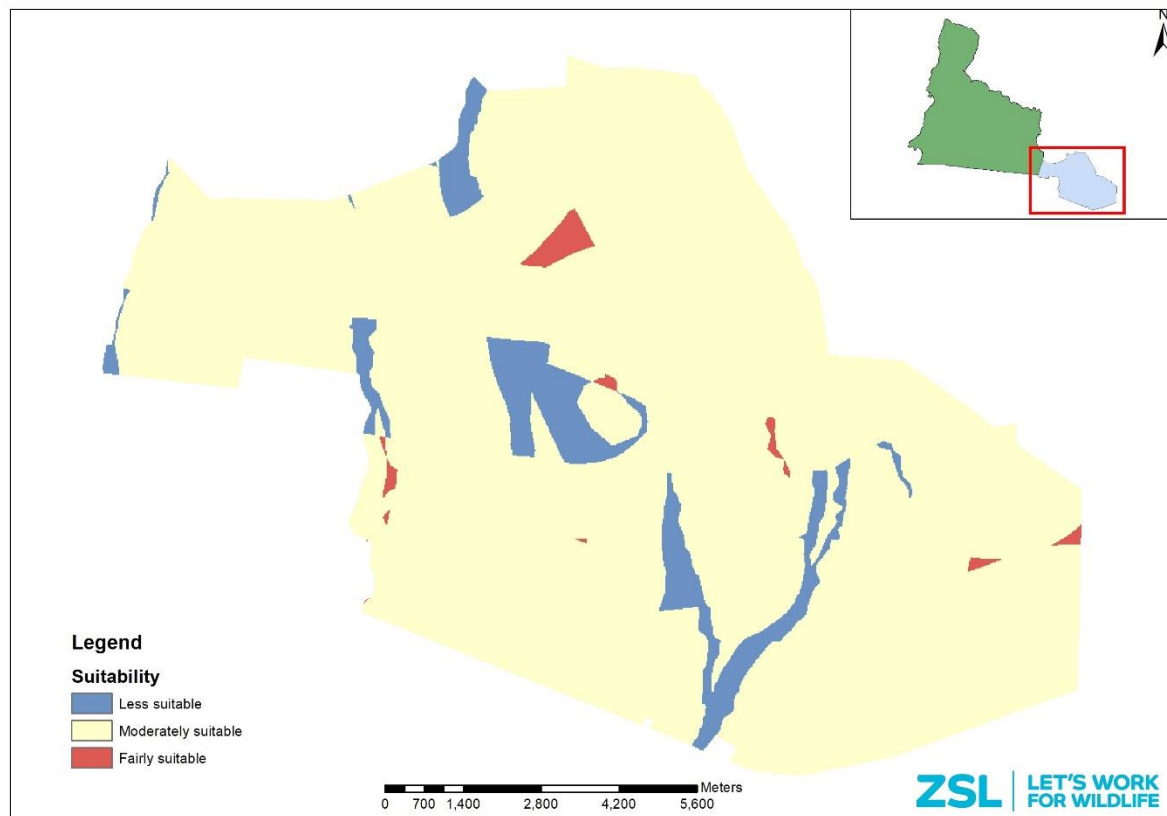
Bengal Fox



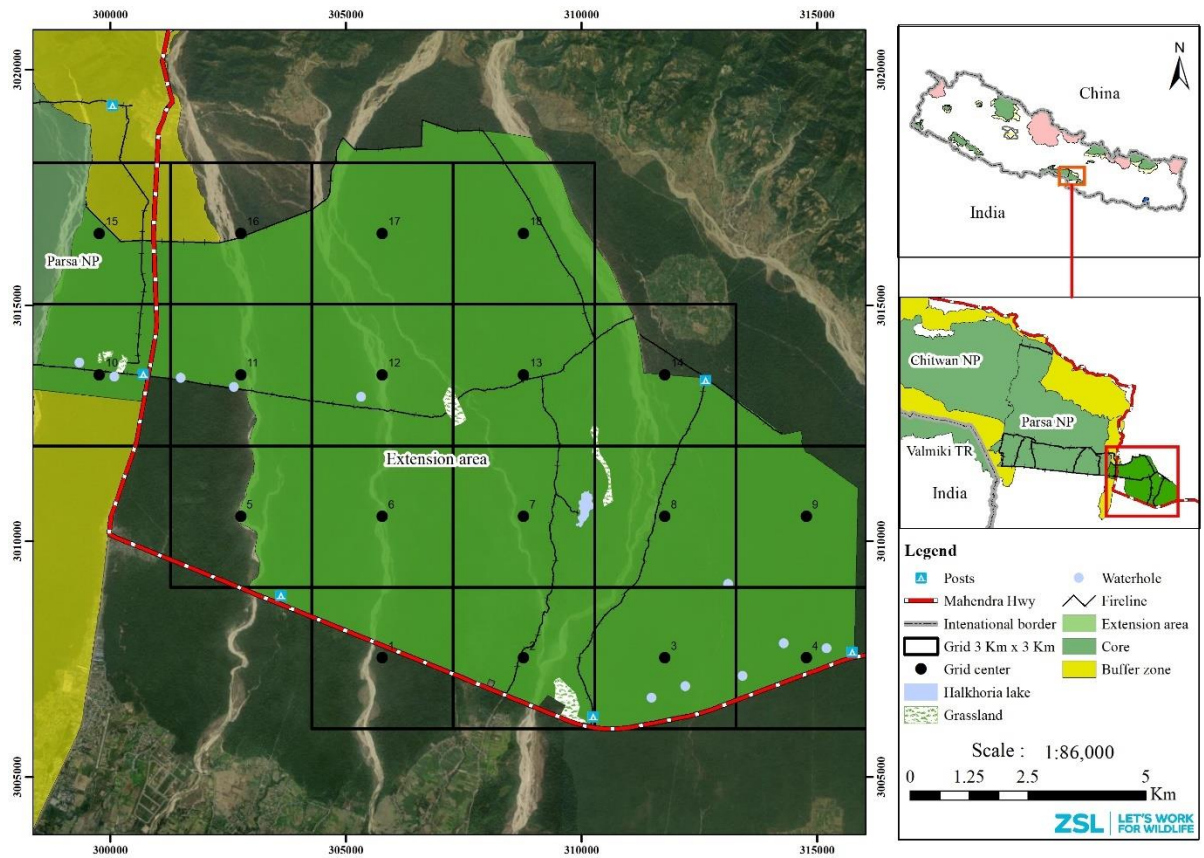
Striped Hyena

Based on the data extracted from the deployed cameras at 16 different locations in the extension area of PNP, we have assessed habitat suitability for tigers in the designed project areas.

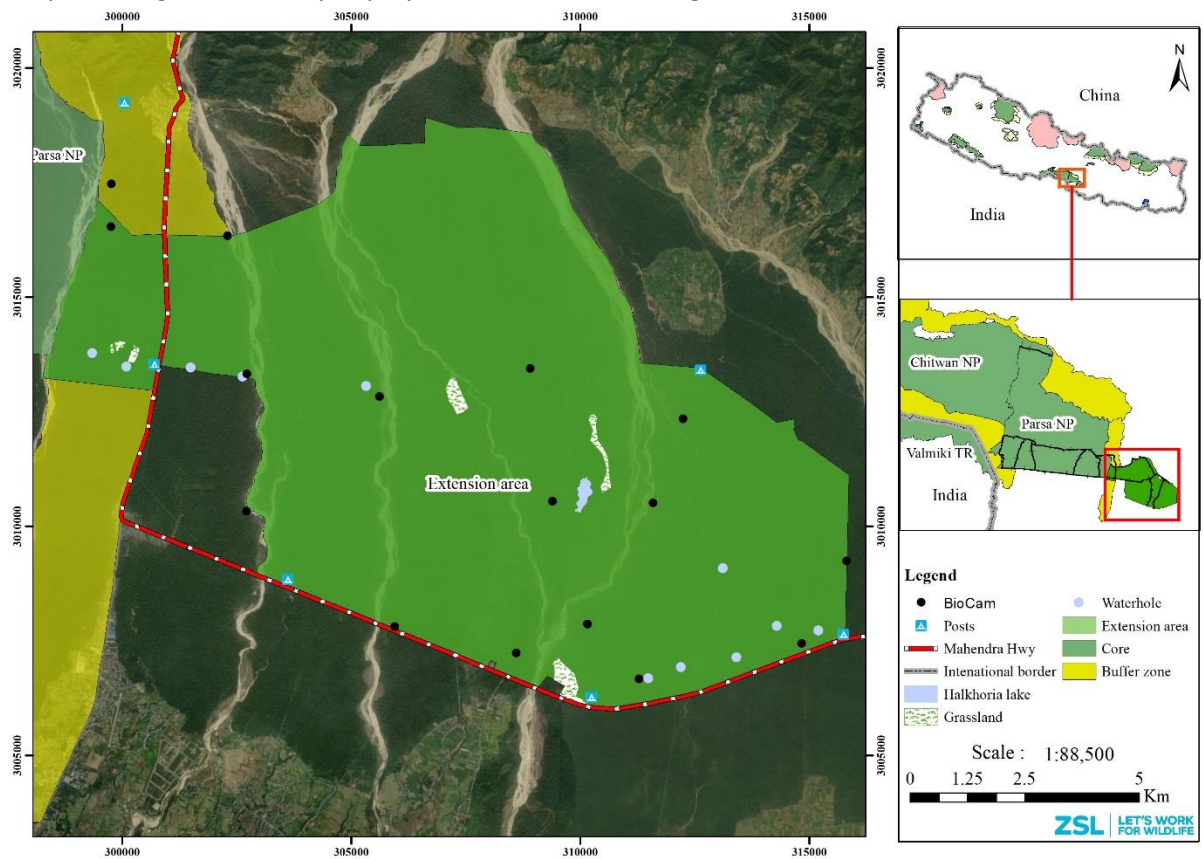
The habitat suitability for tiger in the area is given below: (need to review the map)



The map showing camera trapping grids in the extended area is given below:



Map showing the currently deployed camera locations is given below:



Key achievements of this project: *(Please give a bullet point list of key measurable outputs- for example xxx of staff trained in SMART monitoring techniques, xxx camera traps covering xxx km²)*

SMART monitoring techniques were not a part of this project.

Key achievements

- Mapped out habitat patterns of the extension area of PNP covering 128 km².
- Provided technical and financial support for the expansion of 20 ha of grassland at a strategic location in the extension area.
- Supported to construct one new waterhole in the extension area of PNP.
- Recorded 25 mammal species by conducting hotspot monitoring in the extended area of PNP.

Obstacles to success: Give details of any obstacles/challenges to success that the project has encountered. *(Any changes to the project that have affected the budget and timetable of project activities should have been discussed prior to the end of the project)*

The torrential rainfall that occurred at the early monsoon season inhibited us to conduct activities in the projected timeline, but we managed to complete the entire project successfully with only slight changes in the timetable.

Monitoring and Evaluation: *(Describe the methods used to monitor and evaluate the progress of the project)*

The ZSL staff member responsible for the implementation of this project was also the lead person that periodically monitored the project. Apart from the project leader, previously formed Project Management Unit (PMU), comprised of the Chief Conservation Officer (CCO) of the park, Divisional Forest Officer, representatives from NTNC, ZSL and community leaders as members, were involved in monitoring and evaluating the impacts of the project. Centrally, the PCC monitored the implemented activities of the project. The PCC is the central level body with the Deputy Director General of DNPWC as chairperson, section heads of DNPWC and ZSL (CR/DCR) as members. Monitoring and evaluation involved field visits, data collection on HTC incidences, data collection on habitat management from park, project progress review and its sharing.

Shared learning: *(How will you share the outputs and learning from your project, in what format and with whom?)*

Internally, ZSL maintains an online database accessible to all staff which hosts project reports and outputs. Externally, all project outputs will be made available on ZSL and partner's websites and disseminated via different social media (Facebook, twitter, blogs). Content will be provided to the WCCA press for inclusion in media outreach.

We will disseminate the information further afield through associated organisations such as the relevant IUCN specialist groups, other conservation and development agencies working in Nepal, and at related events held at ZSL's London headquarters. Data will be shared to feed into global conservation initiatives such as the Living Planet Index as well as national needs, such as the regular reporting to the CBD. Information regarding the project will be shared with DNPWC – the focal government body for wildlife through PCC.

Media: *(Please provide a list of publications and media both local and national which mentions the work funded by this project and/or mentions WildCats Conservation Alliance)*

Have you provided at least 2 blogs? Y/N?

Have you provided at least 10 high quality images with details of the relevant credit? Y/N?

Yes, ten high quality images with details of the relevant credit will be provided as a separate folder.

Section III. Appendix (Please populate this section with details from section II)	
Did you carry out camera trapping as part of this project? Y/N	
Yes	
If yes:	
Total camera trap nights/days: >2,000 trap days	Total area surveyed: 128 Km ²
Numbers of tiger/leopard/prey recorded: Tigers recorded on every camera that we have installed in 16 grid cells but individual not identified and 3 leopard's cubs were also recorded; total of 25 mammals recoded. Detailed report preparation ongoing.	Have you included data on other species recorded?
	Yes
Did you carry out patrolling as part of this project? Y/N	
No	
If yes:	
Total distance patrolled:	Total area patrolled:
Do you use Patrol Monitoring software such as SMART? Y/N	

No		
If yes: Total distance patrolled using patrol monitoring software?		How do you collect data? Handheld devices/paper/other? Please give details. NA
Does your project work with local communities? Y/N No		
If yes: (please be as specific as possible) Who?	What did you do?	How many people did you reach?
How do you measure the success of this activity?		
Did you carry out educational activities with adults or children? Y/N No		
If yes: Who?	What did you do?	How many people reached?

Have you seen behaviour change from these activities? (Please give details of how this is measured)		
Did you carry out training activities for any staff/community member on the project? Y/N		
No		
If yes: (please be as specific as possible)		
Who?	What did you do?	How many staff trained? How many others trained?
How do you measure the effectiveness of this training?		
Did you carry out conflict mitigation activities with community members?		
No		
If yes:		
Who?	What?	How main people did this include?

Have you seen behaviour change from these activities? (Please give details of how this is measured)		
Were any scientific papers/articles published because of your project? Y/N		
No		
If so, please give details or provide copies.		