

## Project Update: January 2019

### Project Rationale

The globally vulnerable mugger crocodile is restricted to protected areas in Nepal, Suklaphanta National Park and its surroundings being one of the prime habitats of the viable mugger population in Nepal. Reports of human-crocodile interaction outside the national park have been increasing as crocodiles disperse to nearby agricultural land or fish farms where they are considered a nuisance by people. Persecution of crocodiles due to fear and economic loss on fish farming or agricultural land is increasing every year but relatively little concern for associated conflict, its impact on the livelihood of farmers and its mitigation measures has been given. The project is intended to inquire as to the cause, effect and measures to prevent the problem of human-crocodile interaction around the national park.

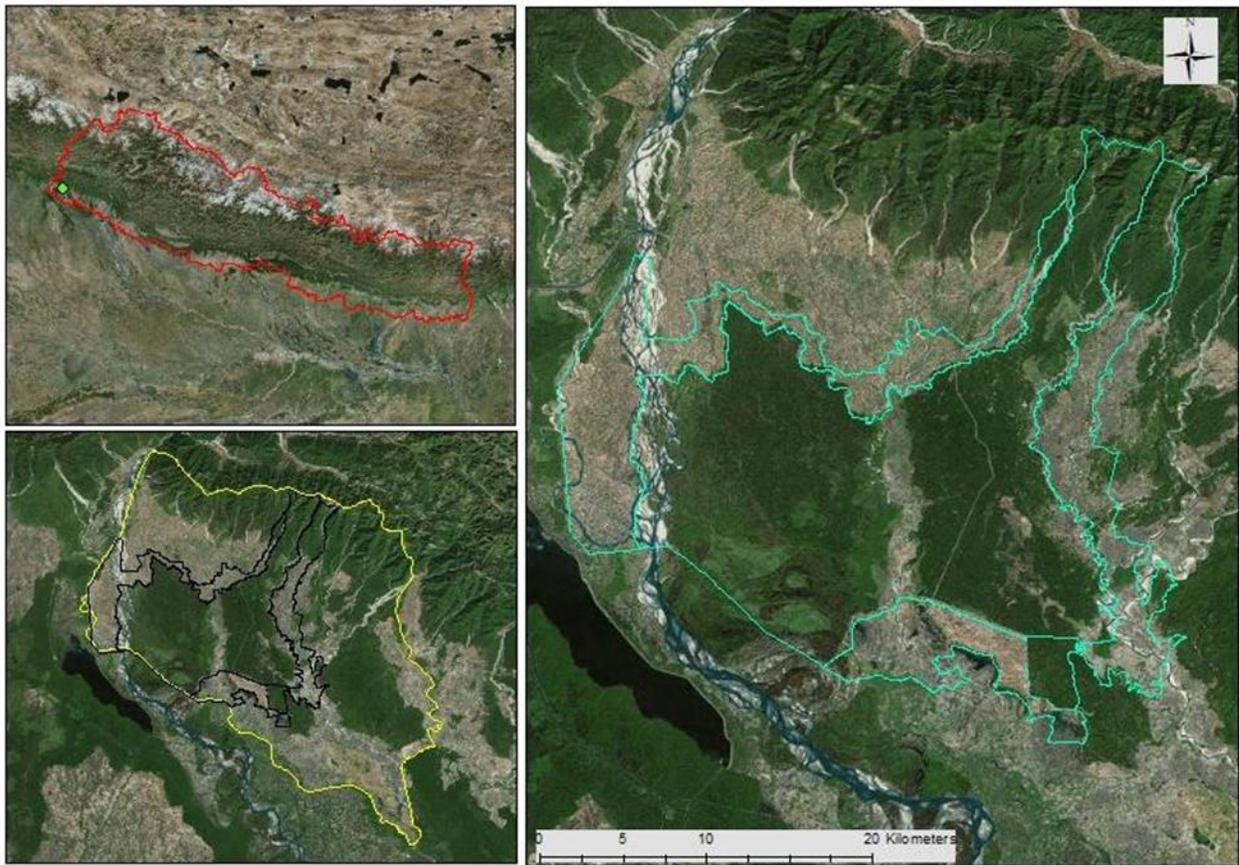


Fig 1: Map of Nepal and Study area (Image Credits: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community)

## Location

Suklaphanta National Park (previously Suklaphanta Wildlife Reserve) lies in far western Nepal within Terai Arc landscape extending between 28° 42' to 29° 03' N and 80° 03' to 80° 25' E, covering an area of 305 km<sup>2</sup>. The park is popular for its largest intact patch of tall grasslands of Tarai-Duar savanna and grassland, an endangered ecoregion (Olson and Dinerstein 1998) in the foothills of the Himalaya range, an important habitat for globally threatened species such as the royal Bengal tiger, *Panthera tigris*, swamp deer, *Rucervus duvaucelii*, hog deer, hispid hare, greater one-horned rhinoceros, Bengal florican, Indian python, and mugger crocodile amongst others (Bhujju et al. 2007).

## Update Summary

We are nearly at end of the project. Almost all of the objectives have been reached with a few activities remaining. We have successfully conducted various field studies in Suklaphanta National Park and its buffer zone to collect various pertinent data on habitat, population and conflicts. Similarly engaging the local community towards conservation of mugger crocodile has been done through workshops, radio programmes and poster distribution.

We are also continuously working on gathering a few data related to breeding ecology of the species and providing a rock solid base on strategies to conserve the species in human-dominated landscapes outside the protected areas in Nepal.

All the activities already performed and those to follow are given in a table below:

	<b>Indicators</b>	<b>Achievements</b>	<b>Action Planned</b>
Objective 1: Habitat and population assessment within the landscape			
Activity 1.1 Population assessment of the species	Result of the population size and structure	Field Study for the activity has been completed. Photographic capture of the crocodiles in the area has been conducted in blocks throughout the national park where crocodiles are known to inhabit. The same place was visited thrice to make a photographic capture- recapture model of the species observation.	Data analysis is still in the way. We are currently looking identifying the species based on the scales and marks.

Activity 1.2 Habitat assessment of the species	Information about species biology	We are currently working on GIS and remote sensing- based wetland classification in the National park and its buffer zone.	We are yet to get the information on feeding and breeding ecology of the species.
Objective 2: Evaluation and mitigation measures for human-crocodile conflicts			
Activity 2.1 Conflict assessment and perception	Information about conflict status and perception by people	Semi-structured questionnaires in buffer zones likely to be affected by the crocodiles were conducted to find the conflicts and perceptions among the residents ground the national park. More than 200 forms were collected from major conflict region.	Analysis will reveal the status of the conflict which we plan to do soon.
Activity 2.2 Contingent valuation	Information about people's willingness to conserve the species	Semi-structured questionnaires in buffer zones likely to be affected by the crocodiles were conducted to find the willingness to conserve the species around human settlements have been conducted. More than 200 forms were collected from major conflict region.	Analysis will reveal the status of the conflict which we plan to do soon
Activity 2.3 Potential conflict mitigation measures	Local people trained/ provided for crocodile preventive aquaculture.	Fish-farmers that are affected by the conflict have been identified.	We are in talk with the relevant stakeholders to determine the activity to be taken.
Objective 3: Promoted crocodile conservation by local people and relevant stakeholders			
Activity 3.1 Conservation	Posters and Radio programs in	Radio jingles that relate to	

Awareness Programs	place	conservation of wetland, crocodile and earning benefits from the wetland and crocodiles are being currently aired by local radio station. Similarly, posters related to habitat ecology, threats, and conservation measures are distributed to major stakeholders and local people	
Activity 3.2 Strategy for conserving crocodiles in human dominated landscapes	Strategy guidelines for crocodile conservation in place	The strategy guidelines are drafted.	We are consulting to the relevant stakeholders about promoting the draft. It will not be done during project duration, but the update will be sent.



Fig. 2: Project Team Member collecting data on perceptions and conflicts

# जलिय पारिस्थितिक प्रणाली संरक्षण गर्न मगर गोहीको संरक्षण गरौ ।



सम्मार्ण फोटोहरूको प्रतिलिपि अधिकार: Dipendra Adhikari. सँग सबन्धित छ ।

## मगर गोहीको परिचय :

- विश्वमा पाइने २४ प्रजाति गोहीहरू मध्ये एउटा प्रजाति
- विश्वमा नै संकटापन्न
- नेपालमा संरक्षित क्षेत्र एवं वाहिरका केहि प्राकृतिक वासस्थानमा मात्र पाइने
- वासस्थान: ठूला नदि र ताल-तलैया
- जलीय पारिस्थितिक प्रणालीको शिर्ष सिकारी

## संरक्षणका चुनौती :

- अव्यवस्थित शहरीकरण
- ताल, तलैया एवं नदिहरू सुक्नाले
- माछा मार्नका लागि जथाभावी जाल राखनाले अथवा विष प्रयोग गर्नाले
- सिकार गर्नाले

## संरक्षण कसरती:

- ताल, तलैया एवं नदिहरू भन्दा टाढा घरहरू बनाउने
- ताल, तलैया एवं नदिहरू बाट अप्राकृतिक रुपमा पानी सिचाई नगर्ने
- नदि, ताल-तलैयामा विष प्रयोगमा प्रतिबन्ध लगाउने र जथाभावी जाल प्रयोग नगर्ने र नगराउने
- बन्धजन्तु संरक्षण सम्बन्धि प्रचलित कानूनको मर्यादा पालना गर्ने

## संरक्षण किन:

- हिन्दु धर्म ग्रन्थ अनुसार गोही देवी गंगाको प्रतिक हो
- यसले जमिन माथिको पानीको सतह व्यवस्थित गरी जलस्रोतमा आधारित अन्य पशुपंक्षीको वासस्थान बनाउछ
- गोही अध्ययन एवं अवलोकन गर्न पर्यटकहरूलाई आकर्षित गराई पर्यापर्यटन मार्फत आर्थिक उन्नती गर्न मद्दत गर्छ
- जलिय पारिस्थितिक प्रणालीमा शिर्ष सिकारी भएको हुनाले अन्य पशुपंक्षीको सङ्ख्या व्यवस्थित गरी जलीय पारिस्थितिक प्रणालीमा महत्वपूर्ण योगदान दिन्छ



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Fig.3: Poster Published for promoting conservation



Fig 4: A collage of individuals seen on population survey

#### Changes in Plan:

Some of the activities planned in the project could not be done according to the plan because most of the original team members had to leave the project as soon as it started, and gathering a new team from out of the project site was a difficult task. Also, some of the methodological approaches explained in the proposal, like population assessment using live capture, was changed to allow for time and use of new technologies were promotes for photographic capture-recapture and GIS and remote sensing-based wetland classification.

#### References Cited:

Bhujju, Ukesh Raj, Puspa Ratna Shakya, Tej Bahadur Basnet, and Subha Shrestha. 2007. *Nepal Biodiversity Resource Book: Protected Areas, Ramsar Sites, and World Heritage Sites*. International Centre for Integrated Mountain Development (ICIMOD).

Olson, David M., and Eric Dinerstein. 1998. "The Global 200: A Representation Approach to Conserving the Earth's Most Biologically Valuable Ecoregions." *Conservation Biology* 12 (3): 502–15. doi:10.1046/j.1523-1739.1998.012003502.x.

