

Ecology and Conservation of Ganges River Dolphin (*Platanista gangetica gangetica*) in the Karnali River, Nepal

Final Technical Report



Submitted by



Submitted to



CLP project ID # 031191513

Study site

Karnali River, Nepal

Team

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Institution involved

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Aim

To develop a foundation for Ganges River dolphin conservation in Karnali
River, Nepal

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Submission date

September 21, 2015

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ACKNOWLEDGEMENT

We would like to thank the Conservation Leadership Programme for funding this project.

We are thankful to the Department of the Wildlife Conservation and Protected Area Management (DNPWC), Government of Nepal for providing permission to conduct this research project.

We are very much grateful to our project supervisor Dr. Sandeep Kumar Behera of WWF India and Dr. Keshav Datt Awasthi of the Institute of Forestry (IOF), Pokhara Nepal for their mentoring and support throughout the project.

Our deepest gratitude goes to Mr. Bhoj Raj Shrestha of the Dolphin Conservation Centre Kailali for his inspiration to initiate this work.

We also thank Dr. Jennifer Lewis of Tropical Dolphin Foundation (USA), Brian D. Smith of IUCN /SSC Cetacean Specialist Group and, Nachiket Kelkar of the Ashoka Trust for Research and Development (India) and Nadia Richman of the Zoological Society of London for their constructive feedbacks on research methodology of the project.

Our sincere thanks goes to Robyn Dalzen, ex-executive manager of the CLP, Stuart Paterson Executive manager of the CLP, Kiragu Mwangi, Julie Lewis, Christina Imrich, Iain Dickson and all CLP staffs for regular guidance, mentoring and motivation for our work.

We also highly acknowledge following persons for their guidance and support during the project:

Mr. Tikaram Adhkari, Director General, DNPWC

Mr. Gopal Prakash Bhattarai, Ecologist, DNPWC

Dr. Maheshwar Dhakal, Under Secretary, DNPWC

Mr. Ramesh Thapa, Bardiya National Park

Mr. Rabin Kadariya, National Trust for Nature Conservation (NTNC)

Mr. Sambhu Paudel, Kathmandu Forestry College

Mr. Bijaya Raj Shrestha of Dolphin Conservation Centre, Kailali

Dabeer Hasan and Viveksheel Sagar, WWF India

Last but not least we are thankful to the wonderful field assistants, local community, students, fishermen and all who directly or indirectly contributed to make this project success.

Section 1:

SUMMARY

Categorized as Endangered species by the International Union for Conservation of Nature (IUCN), the Ganges River dolphin's (*Platanista gangetica gangetica*, Roxburgh 1801) population is thought to have declined by 50 % since 1994. Understanding abundance, factors that affect its distribution and the threats that make its survival challenging is thus critical for developing evidence-based conservation to reduce its population decline. However, there is limited information on abundance, threats and factors that underlie its distribution in Nepal. The main aim of this project was to build a foundation for long term dolphin conservation program in the Karnali River of Nepal through research, conservation education, local community involvement and trans-boundary collaboration with India. Using the direct count method, we counted a total of 18 river dolphins (best-high-low estimates= 18-27-16) along a 65 km long Kaudiyala section, the main channel of the Karnali River, although methodological biases mean this figure is likely to be an underestimate. We found an increased probability of dolphin presence in downstream river segments which may be related to stream velocity and fish biomass. The survey of fishermen's perceptions demonstrated that 90% of respondents perceived a decline in fish catch and dolphin abundance from 2003 to 2013. Habitat degradation due to deforestation and infrastructure development (road, irrigation and hydropower) in the catchment area, stone and sand excavation in riverbank/riverbed and habitat fragmentation (due to the Girijapuri Barrage in India) were found as the major threats to river dolphins in the Karnali River. As a part of capacity building and conservation awareness, we conducted school teaching programs, fishermen awareness programs, and held training programs on dolphin population survey techniques. We have also been able to establish trans-boundary collaboration between Nepal and India for dolphin conservation. Results of the project and the subsequent recommendations have been, incorporated by the local authority (Bardiya National Park) into their annual plan of action for dolphin and its habitat conservation. We recommend that immediate conservation efforts be focused in downstream habitat of the Karnali River where most of the dolphins occur and there is a high chance of human-dolphin interaction.

INTRODUCTION

The Ganges River dolphin (*Platanista gangetica gangetica* Roxburgh 1801) occurs in the human-dominated floodplain rivers in South Asia and faces threats from habitat loss and fragmentation

due to damming of rivers for hydropower and irrigation (Baruah et al. 2012; Choudhary et al. 2012; Braulik et al. 2012), incidental by-catch in fishing gear (Mansur et al. 2008), deliberate killing for their oil (Sinha, 2002), river pollution (Kannan et al. 1997) and reduction of their prey (Kelkar et al. 2010). River dolphins are often considered as an indicator species for healthy freshwater ecosystem in the Indian subcontinent (Behera et al. 2013). They can act as population trend indicators in degraded freshwater ecosystems (Braulik et al. 2014). Despite this importance, river dolphins have received little conservation attention (Behera et al. 2013). As a result multiple factors continue to threaten their survival.

Endemic to Nepal, India and Bangladesh, the population of Ganges River dolphins has declined by more than 50% since 1994 and has been thus classified as “Endangered” using the IUCN Red List Categories and Criteria (Smith et al. 2012). Although robust abundance estimates are not available, many previous studies estimated that there are fewer than 2,000 Ganges River dolphins left in the wild (Smith et al. 2012) and out of which fewer than 100 dolphins may exist in Nepal as a migratory population in trans-border rivers of Nepal and India (Janwali & Bhujju, 2000; Sinha et al. 2000; Jnawali et al. 2011). The National IUCN Red List Assessment of Nepal has classified the Ganges River dolphin as “Critically Endangered” (Jnawali et al. 2011). Dolphins have become extinct from the Mahakali River system, Nepal (Smith et al. 1994; Janwali & Bhujju, 2000). Remaining dolphins in the Koshi and Karnali rivers have become isolated by barrages (i.e. low gated dams) that were constructed along the Indian frontier for irrigation purposes in the late 1960s (Smith et al. 1994; Khatri et al. 2010).

Until recently, very little was known about the status and ecology of river dolphins in Nepal. The Karnali River, perhaps the only river having a viable dolphin in Nepal (Smith, 1993), has been under a tremendous anthropogenic pressures for the last few decades. This has threatened the existence of river dolphins, particularly during the dry season when the river flow is low which intensifies fishing pressure and makes fewer habitat patches available for foraging (Braulik et al. 2012). A lack of robust information on the dolphins status and distribution, coupled with a low level of conservation awareness among responsible agencies, has been a major constraint to conservation efforts in the Karnali River. This project was thus initiated to bridge this gap and assist conservation practitioners in conservation planning. Our goal was also to develop local capacity to build the foundation for a long term conservation program. The results obtained through this project would help conservation practitioners understand the current conservation status of dolphins in the Karnali river, threats that affect dolphins and their habitat and consequently prioritize the conservation efforts in the needed location.

The project site, the Karnali River adjoins two terrestrial protected areas, Bardiya National Park (Nepal) and Katarniyaghat Wildlife Sanctuary (India). The Karnali River is located downstream of the Siwalik foothills of the Nepal Himalayas and represent the extreme upstream limit of the Ganges River dolphin's distribution. These protected areas afford nominal protection to about 10% of the dolphin habitat in Nepal. There is a considerable concern that the isolated dolphin population in the Karnali River may become extinct in the near future due to inability to halt ongoing and emerging threats from both Nepal and India (Paudel et al. 2015).

PROJECT MEMBERS

Project Leader: Gopal Khanal, age 23, is a final year student of the BSc degree program in Forestry at Institute of Forestry (IOF), Pokhara Campus, Tribhuvan University. He has been involved in dolphin research and conservation activities in the trans-border region of Nepal for the last three years. Recently, he has founded an NGO, River Dolphin Trust (RDT). The RDT aims to support the conservation of freshwater river dolphins and their habitat by promoting science based conservation practices. Mr. Gopal was involved in project design, data collection, analysis and report writing.

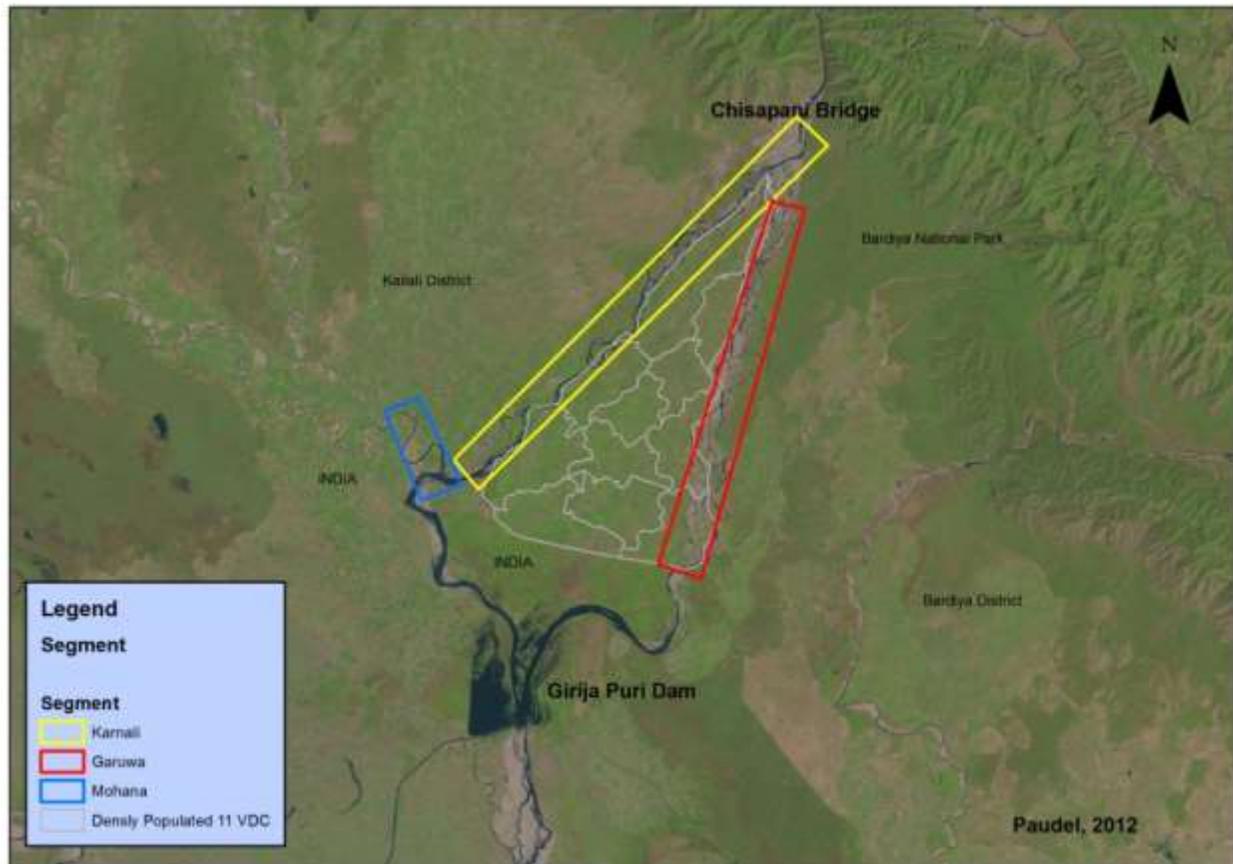
Project Member: Dipendra Nath, age 25, is a final year student of the BSc degree program in Forestry at Institute of Forestry (IOF), Pokhara Campus, Tribhuvan University. Currently, he is also working an NGO, River Dolphin Trust as a research scholar. Dipendra has assisted with the fishermen surveys and conservation awareness campaigns. He also helped with the preparation of the final report.

Project Member: Ram Autar Chaudhary, age 29, is a ranger at the Department of Forest Nepal. He has completed his BSc degree on Forestry from the Institute of Forestry (IOF), Pokhara Campus. For his BSc degree, Ram Autar examined the relationship between fishermen livelihoods and river dolphin conservation. Currently, he also works part-time for the River Dolphin Trust as a research scholar. For this project, he developed co-ordination with different stakeholder groups including government, organized stakeholder's workshop, and capacity building trainings and was involved in dolphin surveys.

Project Member: Bhojraj Dhungana, age 30, is a citizen scientist with the Dolphin Conservation Sub-Centre in Dhunganatol, Kailali. He has a BA in Sociology. He has over ten year's of experience in dolphin conservation. He was involved in school and fishermen conservation education activities, distribution of educational outreach materials and the fishermen interview survey. He also works for the River Dolphin Trust and is in charge of the citizen science.

STUDY AREA

Karnali River System, Nepal



Section 2:

AIMS AND OBJECTIVES

While the overall aim of the project was build a foundation for long term dolphin conservation program, the specific objectives were to:

1. Determine the population status, threats to, and factors affecting distribution of Ganges River dolphin.
2. Establish, institutionalize and strengthen the capacity of community based dolphin conservation groups comprising all key stakeholders at major dolphin hotspots.
3. Assist conservation practitioners in conservation planning process by providing updated information of field based research, developing coordination among stakeholders and building trans-border cooperation.
4. Enhance the knowledge of school students, fishermen and other local community on conservation value of dolphin by conducting extensive outreach programs.

CHANGES TO ORIGINAL PROJECT PLAN

We changed some components of the project objectives that we thought would not be achievable. For example, for the first objective we had originally planned to assess the dependency of the local riverbank community on freshwater resources in the Karnali River. This objective was changed after discussion among the research team and with advisors, with concern about time needed to collect this data. Instead, we assessed the perceptions of fishermen regarding the status of the fishery and the river dolphin in the Karnali River. We also changed some of the words used in the objectives in the submitted proposal. In place of habitat preference, we set out to understand the effect of different habitat variables on the occurrences of river dolphins. Another change involved in our plans to develop a dolphin conservation plan for the Karnali river. After consultation with the government authorities, we decided against this development because there was no guarantee that the action plan would be used and followed by the government. The action plan would have involved considerable administrative work and so we focused on developing a sound technical report for the wildlife department instead. Similarly, initially we planned to produce a radio program on river dolphins and broadcast it from the local FM radio stations; this was later dropped as we thought that for a radio program we would need to hire separate staff requiring more money and time. In place of the radio program, we published posters to disseminate conservation messages.

METHODOLOGY

Determine the population status, threats to, and factors affecting distribution of Ganges River dolphin

1. Population Survey

We conducted a boat-based population survey along a 65 km long, Kaudiyala (or main Karnali) section, the main channel of the Karnali River from the Chisapani Bridge of Nepal to Girijapuri barrage in India, and 60 km long Geruwa-Kothiyaghat section, the eastern channel of the Karnali river. The survey along the main channel was done jointly in collaboration with the experts of WWF India, Bardiya National Park (Nepal) and Katarniyghat Wildlife Sanctuary (India) in January, 2013, while the survey along the eastern channel (Geruwa-Kothiyaghat section) was done by Nepalese team separately. We used the boat-based direct count method for population estimation following the recommendations of Smith and Reeves (2000) for narrow channels, where a single boat using a mid-channel route with multiple observers on board can be sufficient for detection of dolphins (Paudel et al. 2015). Our survey team consisted of four persons: two forward-facing observer; one rear-facing observer and one data recorder. The motorized boat travelled downstream at a constant speed of 5-7 km/hr with the forward-facing observers recording the dolphins along right and left side of the boat. The rear observer was responsible for recording the animals missed by the forward-facing observers. A fourth observer served as data recorder and also searched for dolphins when not filling out the data forms.

When dolphins were sighted, we remained in the area for approximately 5-10 min before recording best, high, and low estimates of the number of animals in the group. The high and low estimates were used to reflect our confidence in the accuracy of the best estimate. The low estimate was considered to be an absolute minimum count and the high estimate an absolute maximum count. A low and best estimate of zero was used if the sightings were unconfirmed and if there was a possibility of already counting dolphin. During some sightings dolphins appeared to follow the boat, which added uncertainty to whether subsequent sightings were new or the same animal(s). In this case we used a low estimate of zero to reflect the possibility of making double counts. This allowed us to evaluate sightings in terms of a range of abundance estimates, rather than an absolute count, which would not reflect the inherent uncertainty about the actual number of animals present in a certain area (Smith & Reeves, 2000). We avoided double counts by maintaining close communication among the primary observers and, for some sightings, we used a zero for our low and occasionally best group size estimates if there was a possibility that the animals had already been counted (Smith *et al.*, 1994). Dolphin encounter rate was calculated by

dividing the number of dolphins sighted by the total length of the surveyed river stretch measured by GPS. Although the direct count survey method we adopted has inherent bias that it cannot account for an imperfect detection of the animals, we tried to increase the detection probability by maintaining a search effort in primary dolphin habitats characterized by an eddy counter current system in the main river flow (Smith, 1993) and deep mid channel waters (Kelkar et al. 2010).

2. Recording ecological and anthropogenic variables

The river stretch was divided into equal 1km sampling segments to record presence/absence of river dolphins and measure associated habitat variables. So, we had a total of 65 and 60 sampling segments in Kaudiyala section and Geruwa-Kothiyaghat section respectively. We recorded water depth, channel width and distance to upstream habitat in the mid of each sampling segment. Since we couldn't record even a single dolphin in the Geruwa-Kothiyaghat section, we omitted the data from this section for further analysis. We used a binomial generalized linear model to test for the effect of above habitat covariates on the occurrence of the Ganges River dolphin. Akaike information criterion (AIC) was used to select the best model (Burnham and Anderson, 2002).

3. Threats Assessment

A direct field observation of potential threat factors including sand mining, use of harmful fishing nets, focus group discussion with fishermen community, literature review and expert consultation were used to assess the potential threats to dolphins and its habitat.

4. Social Survey

We used a structured questionnaire with fishermen to gather data on their perceptions on the status of the freshwater fishery and dolphins.

Establish, institutionalize and strengthen the capacity of community based dolphin conservation groups comprising all key stakeholders at major dolphin hotspots.

We convened formal and informal meetings with local stakeholders at local fishermen villages to establish Dolphin Conservation Groups (DCGs). The purpose of forming DCGs was to develop a network of these groups at local level to initiate community based conservation. To strengthen the capacity of these groups in dolphin monitoring and conservation, we organized a capacity building training for local citizen scientists before conducting the dolphin survey. The training

was facilitated by the project team and dolphin experts from the WWF India including Dr. Sandeep Behera.

Assist conservation practitioners in conservation planning process by providing updated information of field based research, developing coordination among stakeholders and building trans-border cooperation

To assist conservation practitioners in conservation planning, we carried out various activities. Firstly, we trained park staffs from Bardiya National Park and local citizen scientists on dolphin monitoring techniques and involved them in our dolphin survey. The project leader also facilitated a training workshop organized by the Bardiya National Park and WWF Nepal to train local field assistants on river dolphin population survey techniques. Second, we invited rangers and conservation officers of the Bardiya National Park and Katarniyghat Wildlife Sanctuary to a trans-boundary collaboration meeting and national stakeholder's workshop. Third, we provided all stakeholder agencies with a technical report on the findings of our dolphin survey which has been used to inform conservation management decisions.

Enhance the knowledge of school students, fishermen and other local community on conservation value of dolphin by conducting extensive outreach programs

We developed outreach materials including posters and pamphlets. We conducted school awareness-raising activities using both audio-visual methods and storytelling methods. We had an informal consultation with government line agencies and local stakeholders before convening the national stakeholder workshop and trans-boundary meeting. Various stakeholders including government officials, fishermen, environment enthusiasts, media persons and other local stakeholder were invited in the programs

OUTPUTS AND RESULTS

Determine the population status, threats to, and factors affecting distribution of Ganges River dolphin

1. Population status and distribution

We counted a total of 18 river dolphins (best-high-low estimates= 18-27-16) along a 65 Km long channel of the Kaudiyala section , the main channel of the Karnali River which includes 35 Km in Nepal and 30 Km in India, however some dolphins might have been missed due to highly braided channels and methodological bias (i.e. availability bias and perception bias) that are inherent with the direct count methodology we used (e.g. long submergence times, cryptic surfacing and observer inattention or focus on locations different from where dolphins are surfacing). We thus believe that the actual number of dolphins in the Karnali River could be substantially higher than that we reported here. The overall encounter rate was 0.27 dolphins per km. Only eight dolphins were spotted within the Nepalese border (i.e Chisapani bridge to confluence of Kaudiyala section and Mohana river, Nepal). No dolphins were observed in the Geruwa–Kothiyaghat section, an eastern branch of the Karnali river but local people reported occasional sightings in the monsoon and the post monsoon season. Local people also reported dolphins have been noted previously (3-4 years before) in the Geruwa channel up to the Golaghat approximately 20 km upstream of Kothiyaghat/Indo-Nepal border. They attributed fewer, or even no sightings of dolphins, in recent years in the Geruwa channel due to the change of flow of the Karnali river from Geruwa to its western branch Kaudiyala in 2010. We also observed a shallow water depth in this channel which is unlikely to support dolphins. Since we didn't observe any dolphins in Geruwa section, we didn't use ecological data of the Geruwa-Kothiyaghat section for further analysis. Dolphins we did see were observed in the very downstream part of the Kaudiyala section (close to Nepal- Indo border and in Indian part) . This indicates that the range of distribution has been declining and shifting towards southern part over the years. This decline can be attributed to high human disturbance due to infrastructure development (particularly embankment construction along the river bank and extraction of sand and stones for Rani Jamara Kulariya Irrigation Project) in the upstream habitats.

Factor affecting distribution of river dolphins

We tested the effect of habitat variables (river depth, river width and distance to upstream habitat) on the occurrence of the Ganges River dolphin using a binomial generalized linear model. The best model included distance from the upstream habitat and width as covariates (AIC = 51.69)

while water depth in addition to the above variables was included in the second best model (AIC=52.99) (Table 1). We found a positive relationship between distance to upstream habitat and the probability of presence of the dolphin ($b = 0.16 \pm 0.06$; $p = 0.006$). This means that the probability of dolphin presence increases in downstream segments (fig 1). This could be due to reduced stream velocity in the downstream segments because dolphins are known to avoid rapid flow and prefer primary habitats characterized by an eddy counter current system in the main river flow (Smith, 1993). Downstream habitat in the Karnali River also offers favorable sites for ferry crossings and fishing activity (WWF Nepal, 2006). There is thus increased interaction between dolphins, fishermen and other river-users. This can lead to higher rates of human disturbance for dolphins and also competition for fish between dolphins and fishermen. Another interesting factor found included a negative relationship between river width and the probability of dolphin presence ($c = - 0.01 \pm 0.00$; $p = 0.023$) (Table 2 and Fig 2). However, we feel this might be due to imperfect detection of dolphins when in wider sections. This result is also consistent with the findings of the Bashir et al. (2012), who found negative relationship between width of the river and dolphin occupancy. This demonstrates the need for accounting for imperfect detection by occupancy models to effectively monitor river dolphin populations. In our case we have two best models that could be considered to have similar AIC in some way (AIC₁ = 51.69; AIC₂ = 52.99; Table 1). So, why we chose the model 1 instead of taking the mean of both models? It is because 1) we thought that both values of AIC are not so similar - AIC₁ - AIC₂ = 1.3, 2) the model with AIC₁ has less parameter. When we have less parameters in our model, our model is simpler, which means that our model have less bias caused by chance. The model with river depth didn't better fit with our data in comparison to variables width and distance to upstream habitat. Since our results report higher probability of dolphin occurrences in downstream habitat, we recommend that conservation efforts be focused in downstream habitat of the Karnali River where there is also a high chance of human disturbance to river dolphins.

Model	ΔAIC	AIC	Parameters
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$\text{logit}(p) = a + b \cdot \text{Distance} + c \cdot \text{Width}$	0	51.69	3
$\text{logit}(p) = a + b \cdot \text{Distance} + c \cdot \text{Depth} + d \cdot \text{Width}$	1.3	52.99	4
$\text{logit}(p) = a + b \cdot \text{Distance}$	4.52	56.21	2
$\text{logit}(p) = a + b \cdot \text{Distance} + c \cdot \text{Depth}$	5.52	57.21	3
$\text{logit}(p) = a + b \cdot \text{Width}$	10.54	62.23	2
$\text{logit}(p) = a + b \cdot \text{Depth}$	11.32	63.01	2
$\text{logit}(p) = a + b \cdot \text{Depth} + c \cdot \text{Width}$	12.54	64.23	3

Table 1. Model selection results. The best model included distance to upstream habitat and width as covariates.

Table 2. Parameter estimates and confidence intervals for the best model. Significant estimates in bold.

Parameter	Estimate	2.5%	97.5%	p
Intercept	-5.226	-9.094	-2.613	0.001
Distance to upstream	0.160	0.061	0.293	0.006
Width	-0.010	-0.020	-0.002	0.023

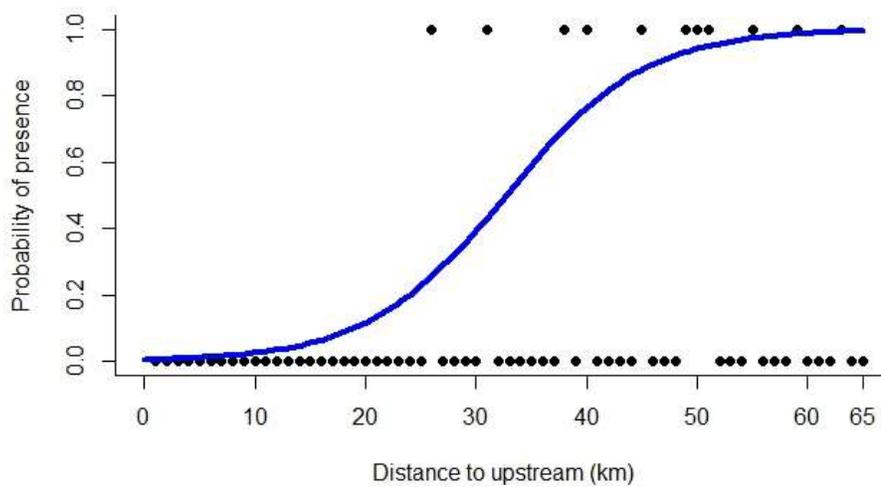


Figure 1. Probability of the presence of Ganges River dolphin across different positions along the upstream-downstream gradient. The blue curve was adjusted with parameters estimated by the best model. Black dots represent the “presence/absence” of the dolphin in each sampling site.

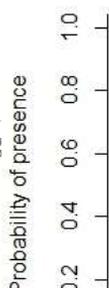


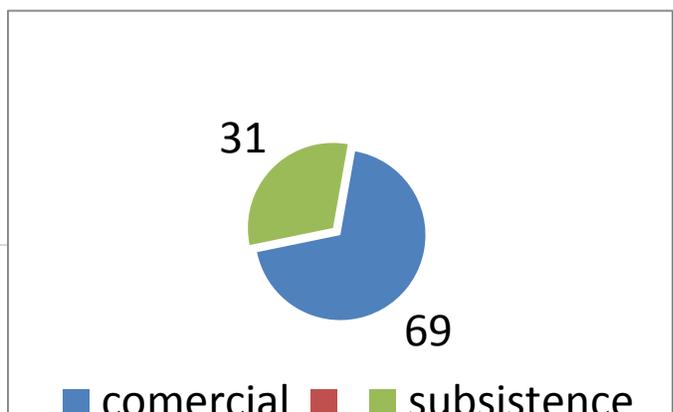
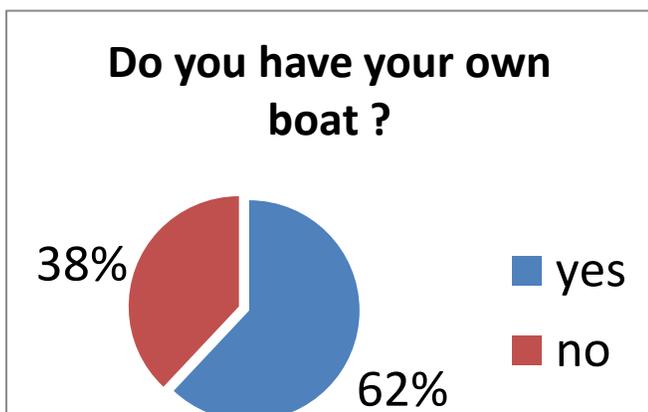
Figure 2: Probability of presence of Ganges River Dolphin across values of width. The red curve was adjusted with parameters estimated by the best model. Black dots represent the “presence/absence” of the dolphin in each sampling site.

2. Threats

Based on our direct field observations, focus group discussions with stakeholders and literature review, we believe that habitat degradation due to deforestation and infrastructure development (particularly road, irrigation and hydropower) in the catchment area, stone and sand excavation in riverbank/riverbed and habitat fragmentation (due to the Girijapuri Barrage in India) are the major threats to river dolphins in the Karnali river. However, we couldn’t rank these threats in terms of their intensity and spatial coverage because of inability to measure realized impacts. Instead it is likely that all contribute to varying degrees and all work together towards creating a situation where the dolphins are struggling to continue to live in this region.

3. Social Survey

A total of 81 fishermen were interviewed to assess their socio-economic status and their perception towards fishing activity and dolphin conservation. From this group 69% of the fishermen said they fish for their livelihood and 31 % fish for commercial purpose. Sixty-two percent of the respondents had their own boat. 90% noticed a decline of fish catches and the dolphin population from 2003-2013. 61 respondents answered that they used nylon fishing nets for fishing.



Types of fishing gear	No of respondent	percentage
Hook line	9	11%
Nets	63	78%
Both	9	11%
Total	81	100

Establish, institutionalize and strengthen the capacity of community based dolphin conservation groups comprising all key stakeholders on major dolphin hotspots

A total of 4 Dolphin Conservation Groups (DCGs) and one Dolphin Conservation Network (DCN) have been formed. These DCGs act as a local community partner and each DCG comprise members from local fishermen, conservationists, and youth and community leaders. The objective of the DCN is to coordinate regular dolphin monitoring activities in collaboration with the Bardiya National Park. During this project we have also been successful in conducting training and stakeholder meetings. 20 persons including frontline park staff and local citizen scientists participated in dolphin monitoring training. 50 persons including forest officials of the Bardiya National Park, District Forest Office, Katarniyaghat Wildlife Sanctuary attended a trans-boundary cooperation meeting.

Assist government officials in conservation planning process by providing updated information of field based research, developing coordination among stakeholders and building trans-border cooperation

To aid in planning and coordination related we assisted the river dolphin training program of the Bardiya National Park in August 2013. During this time training was provided to frontline park staffs and local youths on dolphin monitoring techniques with support from the WWF. A Nepal-India trans-boundary cooperation meeting was also arranged through our efforts in October 2013 for the first time. This meeting has been crucial in establishing collaboration between Nepalese and Indian stakeholder groups. As an outcome of this meeting, we carried out the first joint river dolphin survey in the Karnali River in collaboration with WWF India. In addition to international efforts, local efforts in Nepal included the development of a national stakeholder workshop on dolphin conservation, where we shared our research findings among stakeholders and discussed future research needs. A total of 36 persons from the different governmental and non-governmental stakeholder organizations attended the workshop. All participants agreed to work to conserve dolphins. During this workshop, we identified the roles for the different stakeholders in Nepal dolphin conservation. We provided the related line agencies with a technical report on findings of our dolphin survey, which helped inform management decisions.

Enhance the knowledge of school students, fishermen and other local community on conservation value of dolphin by conducting extensive outreach programs

Our outreach program included focus on school children and adults from local communities. For school children we conducted conservation awareness activities in six schools in Kailali and Bardiya district, in close proximity to the Karnali River. About 300 students actively participated in our school awareness program. Three education program were convened for the fisherman community, in which about 150 local fishermen participated. In addition to these efforts we also organized three awareness programs for Dolphin Conservation Groups (DCGs) where about 150 people participated and 2 meetings were organized for the Dolphin Conservation Network (DCN) formation and coordination. During the above efforts we produced a poster (500 copies), flex banners (15), and hoarding boards (installed in dolphin hotspots) that displays dolphin conservation messages. Posters were distributed among riverbank community, fishermen and students. We also supported Wildlife Week Celebration 2014 by creating the main theme on dolphin conservation at Institute of Forestry (IOF), Pokhara Campus in which about 200 BSc and

Masters level students and professors participated. We also interacted and shared information about dolphin status to media persons and so much media coverage has been achieved.

COMMUNICATION & APPLICATION OF RESULTS

The preliminary results of the project were communicated with the Department of National Park and Wildlife Conservation Nepal (DNPWC) officials at a short meeting in December 2013. The preliminary technical report of the project has been distributed amongst with the DNPWC and Bardiya National Park (BNP), the main two government agencies. The DNPWC and BNP have incorporated some of our project's recommendations into their annual plan of action. For example, we have recommended that the conservation efforts be focused on primary dolphin habitats along downstream part of the Kaudiyala section to protect the dolphins from being accidentally entangled in fishing nets and to preserve their habitat from degradation. Following our recommendations, the national park has expanded the monitoring efforts and outreach activities in downstream villages of the Karnali riverbank to sensitize fishing communities. In addition to this, the national park has accepted our recommendation of conducting at least one annual dolphin monitoring using robust methods to assess the effectiveness of conservation efforts. Moreover, the project findings have been shared among the scientific community by attending student's conservation science conferences. The project leader has so far attended four conservation conferences (Students Conference on Conservation Science (SCCS) Australia, SCCS Bangalore India, SSCS China, 3rd Asia Regional Conference of the Society for Conservation Biology, Malaysia to share the project's findings

MONITORING AND EVALUATION

Although we have not been able to assess the effectiveness of our project's activities explicitly, we have documented some positive effects of our conservation education activities. For example, voluntary involvement of local youth and students in dolphin conservation outreach activities has increased which we found in their participation in our follow up activities. We can report that

conservation concern among the conservation authorities and local communities of the both nations has been increased. The Bardiya National Park authority has accepted our recommendation of conducting at least one survey per year to monitor the dolphin population; this also demonstrates the positive outcome of our project. We have been able to monitor the difference the trans-boundary collaboration made to dolphin conservation and research in the trans-border region of the Karnali river. The joint river dolphin survey in December, 2013 is one of the key examples of the outcome of the trans-boundary meeting. Moreover the capacity building training to frontline park staffs and local citizen scientists on dolphin monitoring and data collection techniques has been highly effective as evidenced by their active involvement in river dolphin monitoring activities of the national park.

ACHIEVEMENTS AND IMPACTS

1. Updated information on population status and distribution of, and threats to river dolphins in the Karnali river

The project has been able to update the current population status, distribution and threats to dolphins in the Karnali River. The project also succeeded in identifying the critical habitat variables that affect the distribution of river dolphins. This updated information has helped and will continue to help conservation authorities develop more evidence-based conservation efforts. As an outcome, the national park staffs have expanded monitoring efforts and outreach activities to sensitize fishing communities in downstream villages of the Karnali River, where most dolphins occur.

2. Capacity of local stakeholders on dolphin monitoring and conservation has improved

Community-based dolphin conservation groups (DCGs) have been established enabling capacity-building for dolphin monitoring and conservation program. This has resulted in increased conservation enthusiasm among local communities and the initiation of dolphin conservation activities at the local level.

3. Trans-boundary cooperation between Nepal and India for dolphin conservation has been achieved

Most importantly, the project has been able to establish Nepal-India collaboration for the conservation of dolphins and their habitat along the trans-border region of the Karnali River. This collaboration resulted in the first ever joint dolphin survey in the Karnali River in December,

2013. The findings of this survey helped us update information on the current population status and distribution of river dolphins in this region, and inform management decisions. While this was a good start, there is a need to strengthen this collaboration and scale up participation of the communities living along the trans-boundary region to ensure that our efforts are sustainable and complement each other's conservation actions.

4. Conservation commitment on river dolphin conservation has been achieved at both local and national level.

We have been able to convene a series of stakeholders meetings and workshops on dolphin conservation from a local to national level. These meetings helped us to inform people about the critical conditions for river dolphins in Nepal and about the importance of evidence based conservation to ensure the survival of dolphins. These results have generated conservation concern not only among authorities and conservation practitioners but also among academia and civil society. This concern among local to policy makers is crucial in promoting evidence based conservation of river dolphins in the future.

5. Conservation awareness among local youths, students and fishermen has increased

Targeted conservation outreach activities have been able to increase understanding of the conservation importance of river dolphins among school students, youth and fishermen communities. This has resulted in increased voluntary participation in dolphin conservation activities. Distribution of outreach materials like posters and installation of hoarding boards at major dolphin hotspots have helped disseminate the conservation message among local communities.

6. Widespread media coverage on conservation issues has been achieved

The project succeeded in achieving media concern and coverage on dolphin conservation issues. Media actively highlighted our research findings, trans-boundary collaboration and national stakeholder's workshop, which resulted in attracting government, civil society and general public concern on dolphin conservation issues in Nepal.

CAPACITY DEVELOPMENT AND LEADERSHIP CAPABILITIES

The project helped improve the research, data analysis and report writing skills of the project team. Examples include sharing the project's findings in international conferences and securing grant funds to continue our research and conservation efforts. Through this work we have also been able to build contacts among scientists, peers and colleagues from India and Bangladesh, who have been working on river dolphins and freshwater biodiversity (important for team members future development in the field). Skills acquired during the project included the building of communication skills and leadership capabilities. This is evidenced by the team's success in successfully organizing the first ever trans-boundary cooperation meeting between Nepal and India; the first ever joint dolphin survey of the Karnali River, and; the first national workshop on dolphin conservation. As an example, our work inspired others to report on our roles as leaders. Dr. Jennifer Lewis, Director of the Tropical Dolphin Research Foundation visited the project area in Nepal twice to learn more about our work and has written online blogs to help us promote our conservation efforts. Dr. Jennifer is also producing a documentary on the plight of the Ganges river dolphins and the efforts made by the early career conservation students of Nepal, India and Bangladesh. The project leader, Gopal and his efforts in dolphin conservation in Nepal is a main focus in this film.

The project team also gained experience leading and managing during this project as a result of establishing a NGO, the River Dolphin Trust. The main aim of this NGO is to support conservation of river dolphins by promoting evidence based conservation practices. Research skills of the team were developed during surveys on the Karnali and by the team leader also volunteering for the National Dolphin Survey of India, in the Ganga River in December, 2014. The project leader has also developed his understanding of conservation science and research skills. He attended training on "Estimating Animal Abundance and Occupancy" at the Smithsonian Institution in USA from May 19-30, 2014 with the travel support of the CLP Alumni Travel Grant. This training has helped the team to design dolphin monitoring methods using occupancy analysis to account for the imperfect detection of animals.

Section 3:

CONCLUSION

1. Data based on direct count survey method suggests that the dolphin population size and its distribution range in Nepalese part of the Karnali River have reduced over the years in comparison to the report by WWF Nepal, 2006.

2. Although we couldn't rank direct and indirect threats to river dolphin and their habitat along their intensity, area coverage and urgency, available data shows that overfishing using harmful fishing gear, habitat degradation due to deforestation and infrastructure development (road, irrigation and hydropower) in the catchment area, stone and sand excavation in riverbank/riverbed and habitat fragmentation (due to the Girijapuri Barrage in India) are major threats to river dolphins in the Karnali River.
3. Our results show that dolphins are mostly concentrated in the downstream part of the Karnali river along the trans-border region of Nepal and India. Downstream habitat in Karnali River offers favorable sites for ferry crossings and fishing activity. Thus there is a potential for competition between dolphins and fishermen for resources and human disturbance may avoid dolphins from a preferred habitat.
4. While the project has been able to raise conservation awareness among local stakeholders, develop local dolphin constituencies, build trans-border collaboration, start joint dolphin monitoring in the trans-border region, there is a need to build local capacity, continue joint dolphin monitoring, scale up best practices to ensure and incorporate dolphin conservation issues in the development planning to ensure the long term survival of river dolphins in the Karnali river.
5. Overall, the project contributed to build a foundation for dolphin conservation program by updating information on status and ecology of the river dolphin in this region, establishing local dolphin conservation constituencies, and building trans-border collaboration which was a central aim of this project.

PROBLEMS ENCOUNTERED AND LESSONS LEARNT

1. Working with multi-stakeholders with varied interests in a multi-ethnic society was challenging. However, we are fortunate in that we were able to make them understand the value of river dolphin conservation and develop goodwill among all level stakeholders.
2. We encountered some problems in getting their time while conducting stakeholders meetings and outreach programs for fishing community. People other than conservation background had very low level of conservation concern and they didn't consider conservation and management of freshwater biodiversity as an important task. So, making them understand the value of conservation and getting their time in

- conservation meetings and discussion was problematic. However, once we showed them presentation on benefits of dolphin conservation to entire river ecosystem and sustainable fisheries for their livelihood, they were motivated to participate in our activities.
3. Building collaboration with Indian conservation stakeholders at the initial phase was very difficult as they didn't trust us when we initially made contact. But once we established contact with dolphin experts of WWF India, and we explained our project objectives and we were able to bring them in confidence and establish collaboration.
 4. We had problems with the direct count survey methodology that we adopted for counting dolphins. Since this method can't account the imperfect detection of dolphins and availability bias and gives only minimum population size, our results on dolphin population size should be treated as a minimum population.
 5. We also encountered some administrative constraints on surveying the whole river stretch of the Karnali River, especially the Geruwa river section of the Katarniyaghat Wildlife Sanctuary, India. Although our Indian collaborators, WWF India dolphin experts including Dr. Sandeep Behera had a formal permission for a survey, the District Forest Officer of the Baheraich district, India couldn't give us permission due to their own ongoing management activities in that section of the river. So, again our results on population size should be treated as minimum and only outside the sanctuary area.
 6. We did have trouble measuring the effectiveness of our conservation education. Awareness activities were targeted without designing an education monitoring strategy. Specifically, we could not elucidate whether the target group or persons changed their behavior due to our outreach activities.
 7. We did learn that identification of target groups and formulation of communication strategies along with a planned approach is critical to make conservation education activities effective. For the future, we recommend that rather than directly going for outreach campaigns we first need to identify appropriate target groups of fishing communities based on information of the social survey. We then need to identify the role of communication/education (e.g., Is it to make fishers reduce by-catch and stop adverse fishing practices, change negative attitudes towards dolphins to positive ones?). Next, we need to identify the "key messages" for each target groups (which may differ) and method of communication. The education strategy should include an evaluation component to assess whether the strategy is working. The evaluation

- component for education strategy could help adjust plans what is working and what isn't.
8. Team work is must in each activity. We would not have been able to achieve such objectivities without team work and clear understanding of his/her role.
 9. Balancing development and conservation needs is essential. So each project activities should be tailored with the message that conservation would essentially benefit the development that would be sustainable for future generation to bring development activists in confidence.
 10. Community based conservation approach that regards local people engagement as an essential for long term conservation is must.
 11. Citizen science approach that builds local capacity for conservation by promoting science in local context is essential and could achieve more in sustainable manner with less effort.

IN THE FUTURE

Based on our results, we have realized that the continued local community support is a key to protect dolphins and their habitat. To ensure the sustainability of our conservation outcomes, we will continue building capacity of local stakeholders, and help government authorities develop a dolphin conservation action plan. We plan to conduct at least one joint dolphin survey in the Karnali River every year in collaboration with the relevant stakeholders.

We recommend that conservation efforts be focused on downstream habitats of the Karnali River where most of the dolphin population occurs to reduce the accidental by-catch in fishing gear. Dolphins live and breed in the trans-border region; conservation efforts will be more successful if joint efforts are made from both sides of Nepal and India. Moreover, since less than 10 % of dolphin habitat is under the protection of the Bardiya National Park, there is a need to bring critical dolphin habitats under any form of effective protection where fishermen community should be considered as major partners of conservation. We thus recommend a Community Managed Trans-boundary Dolphin Conservation Area be established in the trans-border region and efforts be made from both Nepal and India to complement each other's efforts. Infrastructure development activities including the Rani Jamara Kulariya Irrigation Project, Upper Karnali Mega Hydropower Project in the catchment area pose grave threats to the remaining dolphins and their habitat in the Karnali River. We thus urge government authorities to stop plans for

implementation or to develop methods that consider the ecological requirements of freshwater species including river dolphins before undertaking implementation of such projects.

Section 4:

APPENDICES (Appendix 4.1 CLP M&E measures)

Output	Number	Additional Information
Number of CLP Partner Staff involved in mentoring the Project	2	Brian D. Smith (WCS) and Matthew Linkie (Flora and Fauna International) in study design and methodological mentoring
Number of species assessments contributed to (E.g. IUCN assessments)		
Number of site assessments contributed to (E.g. IBA assessments)		
Number of NGOs established	1	
Amount of extra funding leveraged (\$)	\$12000	\$ 4000 from the MBZ Species Conservation Grant and \$8000 from the Keidanren Nature Conservation Fund, Japan
Number of species discovered/rediscovered		
Number of sites designated as important for biodiversity (e.g. IBA/Ramsar designation)		
Number of species/sites legally protected for biodiversity		
Number of stakeholders actively engaged in species/site conservation management	5	(Nepal Government, Indian Government, Local fishermen community , NGOs and Media)
Number of species/site management plans/strategies developed	1	The action plan is preparation is under planning in collaboration with the Department of National Park and Wildlife Conservation Nepal because it is more a administrative task

Number of stakeholders reached	9	Nepal Government, Indian Government, Local fishermen community , NGOs (WWF India, Dolphin conservation Centre Nepal), Media, University, Dolphin experts, Scientific community (conference)
Examples of stakeholder behaviour change brought about by the project.	2	<ol style="list-style-type: none"> 1. Conservation Concern has increased among stakeholders 2. They have started supporting in dolphin conservation activities
Examples of policy change brought about by the project		
Number of jobs created		
Number of academic papers published		
Number of conferences where project results have been presented	4	Students Conference on Conservation Science (SCCS) Australia, SCCS Bangalore India, SSCS China, 3 rd Asia Regional Conference of the Society for Conservation Biology, Malaysia

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Project Inception and Stakeholder Consultation



School Awareness Program



Fishermen Awareness Program



With Dr. Jennifer Lewis



Dibendra interviewing fishermen



With Dr. Sandeep Behera during dolphin survey



Joint Dolphin Survey in Karnali river



Interviewing fishermen in river bank



Wildlife Week Celebration 2014



Project Leader, Gopal giving presentation



Outreach Program for students



Ram Autar Chaudhary presenting at National Stakeholder Workshop, 2014



Mr. Bhoj Raj Shrestha, Chairperson of Dolphin Conservation Centre, our major source of inspiration for this work, sharing his experiences



Team Members: Dipendra Nath, Bhoj Raj Dhungana, Gopal Khanal and Ram Autar Chaudhary (from left)



Nepal-India Trans-boundary meeting for dolphin conservation



लोपोन्मुख डल्फिन घटे

• विरा खत्री

काठमाडौं: सन्तकालमा बल्लभारमा रहेको काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।



काठमाडौंको पूर्वी उपत्यका क्षेत्रमा रहेको काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।

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मनसुन सुरु भएपछि डल्फिन देखिन थाले

• आशा शर्मा



काठमाडौं, जूला १० गते। काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।

Dolphin population decreasing due to increased human activities

By Abinash Chaudhary Dhangadhi, Apr.25

Rare Gangetic dolphins found in different rivers of Kailali district in far-west Nepal are threatened because of increased human activities, a study has found.

According to the study, food and habitat of dolphins are dwindling due to poison fishing, construction of dams and deforestation in watershed areas.

The study found that these gentle water animals have to struggle for survival as the water level in the rivers goes down critically during winter.

The District Development Committee awards contracts to fishermen to fish in these rivers. The dolphins have faced food shortage as the fishermen use large nets causing devastation to the fish population.

The studies were conducted by Gopal Khanal and Dipendra Nath, students of the Institute of Forestry, Pokhara.

The three month long study focused on the dolphin population during winter and impact of different factors on these animals enlisted by the IUCN as endangered.

Khanal said that human activities increase considerably when the water level in these rivers is lower.

"Dolphin habitats are dwindling. Though their numbers go up during summer due to arrival migratory animals, the population decreases during the dry season," Khanal said.

Only six to eight dolphins remain as permanent residents during the winter in the Karnali and other rivers, he said.

Karnali, Pathrayia, Kadha, Kanda and Mohana rivers are

the habitat of dolphins in Kailali district. During the 1980s, there were large numbers of dolphins in these rivers.

However, after the construction of large dams in the border area with India, the number of dolphins is found to have gone down in Karnali and Koshi rivers.

In the first dolphin study conducted in 1982, around 20

dolphins were found in the Karnali river. The researchers claim that the population has declined now.

The researchers also found that dolphin populations are limited only in deeper areas of the rivers.

During the research, two dolphins were found at Khakraula Ghat and in the confluence of Karnali and

Mohana rivers. A few others were found at Sunkatti Ghat, Banghusra Ghat, Daulatpur, Rajapur and Daugridi Ghat.

The study claimed that dolphins were unable to migrate after India constructed Girjapuri Dam at Karnali River.

Researchers also added that natural settlement of dolphins has been destroyed due to construction works at river area, water pollution and decreasing level of water.

Those researchers plan to study during the rainy season to find out the numbers of visitor dolphins. Visitor dolphins come to Karnali mainly from Katarniyaghat and Ghagara rivers.

The research was conducted with the support of Mohammad Bin Jayed Conservation Fund and Conservation Leadership Programme.



A dolphin spotted on the confluence of Mohana and Pathrayia rivers in far west Nepal.

कैलालीका नदीमा देखिए डल्फिन

• आशा शर्मा

काठमाडौं, जूला १० गते। काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।

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8 dolphins counted in Karnali River: Study

ANASA NEWS

काठमाडौं, जूला १० गते। काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।



A dolphin spotted recently in the Karnali River.

काठमाडौंको पूर्वी उपत्यका क्षेत्रमा रहेको काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।

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Dolphins...

काठमाडौंको पूर्वी उपत्यका क्षेत्रमा रहेको काठमाडौं उपत्यकाको नयाँ पर्यटन स्थलको रूपमा परिचय प्राप्त भएको छ।

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Social media, external linkages developed

Inspiration and focus of this project

Jennifer Lewis, the director of the TDRF, has been mentoring two students in Nepal that study the Ganges river dolphin in the one river system of Nepal where this species is still found (the Karnali). These two students (Shambhu Paudel and Gopal Khanal) grew up in Nepal in rural areas on the farms of their families. Neither grew up with money. You should be aware that in many of the places Jennifer visited for this film, kids have no government help to go to school. Unlike in the US for example, where all kids can go to school through 12th grade without having to pay for this education. Not so in Asia. Here, if you get to go to school it is because your family somehow could get the money to pay for it. Or you were able to somehow get a scholarship to help.



Gopal Khanal, working on a grant proposal as we get ready for our first day of filming near Bardia National Park in Nepal. (Lewis, TDRF)

These two young men watched the natural environments in their country decline as they grew up. And both decided they would do something about it. In particular, to help bring back the dolphin species that once ranged in four or more river systems in their country. They worked very hard and both have found their way to research and outreach projects aimed at saving this species (they are

Who will save the river dolphin?

WEDNESDAY, JANUARY 5, 2016

Background of Project

Our project mission and goals
 The Tropical Dolphin Research Foundation's (TDRF) mission is to do what we can to protect and conserve tropical dolphin species. To help us make this goal a reality, we are about to embark on a really exciting project, creating a documentary about one of the most endangered of these species, the Ganges river dolphin (*Platanista gangetica*). We are doing this with the following goals in mind: 1) To create a film that will provide information to the public about this species and the need to conserve it, 2) To learn what we can about using this form of media so we can do a better job promoting the conservation issues we are concerned about and 3) To then pass this information (how to use this form of media) to other conservation scientists and managers so they can do the same.

Painting of Ganges river dolphin in Bardia National Park, Nepal (Lewis, TDRF)

- 2015 (8)
- 2014 (45)
- December (7)
- March (3)
- February (18)
- January (18)

Next destination in Bangladesh

Day Two Sundarbans

Hi the Sundarbans!

Heading to: Mangla

EDGE: EVOLUTIONARILY DISTINCT & GLOBALLY ENDANGERED

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EDGE Community

Mr. Gopal Khanal

get a student of Wildlife Ecology in Tribhuvan University (TU) Nepal. Currently I am working as a research assistant on "Ecology and Status of Ganges River Dolphin at the Karnali River System of western Nepal" carried out by my senior colleague. The primary findings of the research were published at the 10th International Pacific Tropical Dolphin Conference held in Nepal and subsequent national population of Ganges River Dolphin which are under the critical attention because of fresh habitat usage and various anthropogenic pressures. The dolphins once found in Mahabharat and Mahabharat river systems of Nepal are already extinct. Realizing the need to restore ecological

Related species: South Asian River Dolphin (*Platanista gangetica*)

Projects: Assessing the status and habitat ecology of Ganges River Dolphin in Karnali River System of Nepal

Factors affecting the distribution of the Ganges river dolphin in Karnali river of Nepal and India

Presented by: Gopal Khanal, Tribhuvan University, Institute Of Forestry (IOF) Pokhara Campus, Pokhara Nepal

Authors: Gopal Khanal 1, Thiago B. A. Costa 2, Dr. Sandeep Kumar Shukla 3 & Dr. Jennifer Lewis 4 1. Institute Of Forestry (IOF), Pokhara Campus, Nepal 2. Projeto Igarapés, Manaus, Brazil 3. River Basin And Biodiversity, Wwf India 4. Tropical Dolphin Research Foundation, Usa Email: Khanal.Jeehpur@gmail.com

River Dolphin Trust

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Who to follow: Chiro Endra Neupane, Koushik Sharma

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Conservation in Action

Trans-boundary commitment for dolphin conservation achieved in Nepal and India

By: Gopal Khanal ("Ecology and Conservation of Ganges River Dolphin in Karnali Nepal", 2013)

Local level wildlife conservation authorities of Nepal and India have agreed to work together to ensure the long term survival of the endangered Ganges river dolphin (*Platanista gangetica*) along the Karnali-Gerewa-Katamiyaghat international waterways of Nepal and India. At the "Nepal-India Trans-Boundary Cooperation Meeting" on 31st October, 2013, authorities and local community stakeholders recognized the importance of trans-boundary cooperation and affirmed the need for collective conservation actions to conserve the dolphin and other freshwater biodiversity of the region. Mr. Ramesh Thapa, Assistant warden of the Bardiya National Park, Nepal and Mr. Irphan Ahmad, Deputy Renzer of the Katamiyaghat Wildlife Sanctuary (India) signed an agreement to develop and strengthen joint conservation actions to reduce the threats to dolphins.



Supported Projects Case Studies Case Study Map Grant Recipient Survey Project Links

Ganges River Dolphin (*Platanista gangetica*)

Mohamed bin Zayed Species project number 14058437

Strengthening Ganges River Dolphin Conservation in the Karnali-Gerewa-Katamiyaghat waterway of Nepal and India through Research, Capacity Building and Trans-boundary Cooperation

The Ganges river dolphin is one of the world's most endangered freshwater mammals. Its numbers in India, Bangladesh and Nepal have plummeted in recent decades largely due to widespread threats such as habitat loss, prey depletion and poaching. According to WWF India (2009), there are less than 1800 dolphins in Nepal, India and Bangladesh. Once widely distributed across all the major rivers of Nepal, it is believed to have been extirpated from the Mahakali and Narayani river systems with few animals remaining in the Koshi and Karnali River. Perhaps, the only viable dolphin population in Nepal is that of the Karnali, upstream of the Girijapur barrage in India, but this population may become extinct due to lack of adequate conservation actions from both sides of Nepal and India. While isolated conservation efforts on both sides of the Nepal and India have long been ongoing, joint efforts to save the remaining population are largely lacking. Until recently, no comprehensive information on the status of dolphin in both Nepalese and Indian parts of this region is available. Since dolphins in this region live in the trans-border region and due to their migratory nature, it seems almost impossible to obtain robust information on their abundance and habitat ecology without trans-border collaboration. Thus the main focus of this follow-up project is obtain robust estimates of abundance of this



Ecology and conservation of Ganges River dolphin in Karnali, Nepal

GOPAL KHANAL

Lack of updated information about population number, their status and ecology and low level of awareness among riverbank fishing communities is becoming a major constraint in the conservation of Ganges river dolphin in the Karnali river of Nepal. This project is designed to improve knowledge about the Ganges river dolphin to assist policy makers in conservation planning. The main objectives are to determine the population abundance, distribution and conservation threats of dolphin, strengthening the capacity of stakeholder, assisting government in conservation planning and enhancing the community participation in conservation. Two sampling methods: direct count and line transect surveys will be used to estimate population status. Community-based dolphin conservation groups will be formed and extensive outreach programmes will be launched. The project is expected to deliver scientific information required for conservation planning with increased community participation in conservation.

1 FUTURE CONSERVATIONIST AWARD

TAXA: MAMMAL

Project ID: 03119513
Award Year: 2013
Region: Asia & Pacific
Country: Nepal





Ganges River dolphin

Platanista gangetica

"We used project funds to update the population status, habitat requirements and conservation threats to Ganges River dolphin in the Kamali River of Nepal. This information has provided important insights on the ecology of an isolated population of dolphin in Kamali and has been used to prepare Dolphin Conservation Action Plan for the Kamali River."

Prior to this project, no robust data on the status and ecology of Ganges River dolphin were available for the Kamali River in western Nepal. But now, we have obtained some important information in this regard.

And that's just the start. Considering the effort has been made to document its status across the wide range, we require a continuous data on numbers, mortality, source of occurrence, and area of occupancy we will be looking for more of the species' range, especially in India and Bangladesh.



Q. PROJECT DETAILS

The main objectives of this project were to conduct detailed research on the status, biology, distribution and conservation threats to Ganges River dolphin in the Kamali River of Nepal. A secondary goal was to raise awareness and disseminate the findings of the research for the conservation of this species.

✓ PROJECT RESULTS

Updated information on population status, habitat requirements and conservation threats to Ganges River dolphin in the Kamali River of western Nepal has been obtained. Increased participation of local communities in conservation activities and improved public awareness of project and species has been achieved by way of awareness campaigns and publications of GMRP. Conservation authorities and stakeholders of GMRP and other NGOs have agreed for more holistic and comprehensive collaboration. An awareness of this kind for conservation approach, the first time of any dolphin population in the country, will aid with the implementation of GMRP and will aid with the conservation of this species.

□ HOW THE FUNDS HELPED

The fund provided funds to update the population status, biology and ecology of the Ganges River dolphin in the Kamali River of Nepal. The information has provided important insights on the ecology of an isolated population of dolphin in Kamali and has been used to prepare Dolphin Conservation Action Plan for the Kamali River.

Project Manager
Nepal Dolphin Conservation Society