Strengthen community engagement to conserve Ganges River Dolphin (*Platanista gangetica*) through participatory-based approach in Koshi River, Eastern, Nepal

UPDATE REPORT

8th September 2025

The Rufford Foundation
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Himalayan Nature (हिमाली प्रकृति)
Himalayan Conservation & Research Institute

Mid-Term Update Report

ACTIVITIES COMPLETED

1. **Data Analysis of Prey Species Survey**
   - **1.1 Prey Species (Fish) Survey**
2. **Conservation Outreach Program**
   - **2.1 Student-Led Drama on River Dolphin and Freshwater Conservation**
   - **2.2 Art competition**
   - **2.3 School Awareness Program**
   - **2.4 Community Awareness Program**
3. **Distribution of Educational Materials (posters, brochures, story books)**
4. **Monitoring of River Dolphin habitat by the River Guard**

Background

The River Dolphin conservation project funded by The Rufford Foundation and being implemented by Himalayan Nature in collaboration with Koshi Tappu Wildlife Reserve (KTWR), National Trust for Nature Conservation (NTNC), buffer zone users committee, river dependent communities, CBOs and schools, particularly at the upstream and downstream of Koshi River. The main objectives of the project are:

- To update data on dolphin populations and existing threats, along with assessing water quality and prey availability in the Koshi River.
- To train and mobilize 10 members from river-dependent communities as River Guards for regular monitoring and dolphin conservation efforts.
- To engage 2,000 students and 1,000 community members through participatory conservation outreach programs.

Progress Report:

1. Data Analysis of Fish Survey

1.1. Fish Survey

As part of the prey base assessment critical to understanding dolphin ecology and informing their conservation, a fish survey was carried out along both the sections (upper and down) of the Koshi River. A total of 35 species has been recorded during the survey, where detailed information provided in the table below:

Table 1: Taxonomical Classification of Fish Species from Koshi River

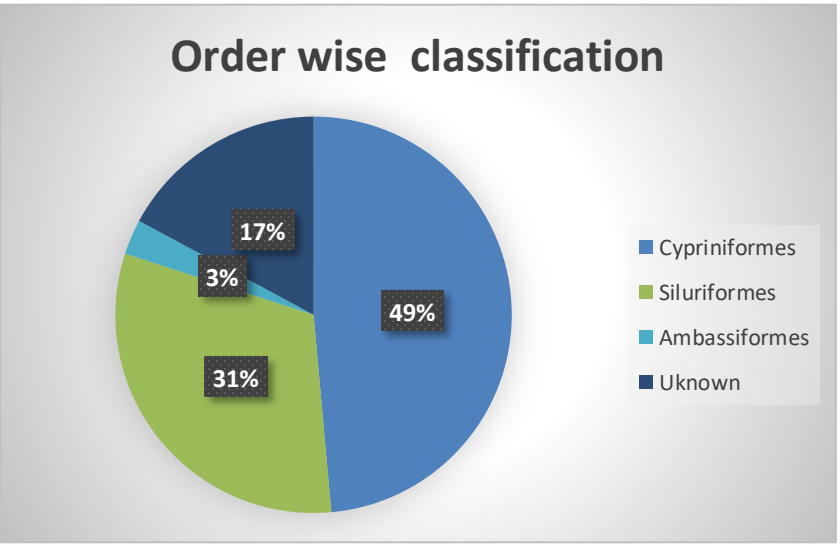
S.N	Scientific Name	Order	Family	Genus	Species
1	*Chagunius chagunio*	Cypriniformes	Cyprinidae	Chagunius	C. chagunio
2	*Sperata seenghala*	Siluriformes	Bagridae	Sperata	S. seenghala
3	*Glyptothorax telchitta*	Siluriformes	Sisoridae	Glyptothorax	G. telchitta
4	*Lepidocephalus guntea*	Cypriniformes	Cobitidae	Lepidocephalus	L. guntea
5	*Barilius barila*	Cypriniformes	Cyprinidae	Barilius	B. barila
6	*Labeo*	Cypriniformes	Cyprinidae	Labeo	Various spp.
7	*Danio devario*	Cypriniformes	Cyprinidae	Devario	D. devario
8	*Gagata cenia*	Siluriformes	Sisoridae	Gagata	G. cenia
9	*Barilius bendelisis*	Cypriniformes	Cyprinidae	Barilius	B. bendelisis
10	*Cabdio morar*	Cypriniformes	Cyprinidae	Cabdio	C. morar
11	*Pseudecheneis sulcatus*	Siluriformes	Sisoridae	Pseudecheneis	P. sulcatus
12	*Lepidocephalichthys guntea*	Cypriniformes	Cobitidae	Lepidocephalichthys	L. guntea
13	*Tariqilabeo latius*	Cypriniformes	Cyprinidae	Tariqilabeo	T. latius
14	*Tor putitora*	Cypriniformes	Cyprinidae	Tor	T. putitora
15	*Puntius terio*	Cypriniformes	Cyprinidae	Puntius	P. terio
16	*Aspidoparia jaya*	Cypriniformes	Cyprinidae	Aspidoparia	A. jaya
17	*Puntius conchonius*	Cypriniformes	Cyprinidae	Puntius	P. conchonius
18	*Barilius shacra*	Cypriniformes	Cyprinidae	Barilius	B. shacra
19	*Bagarius bagarius*	Siluriformes	Sisoridae	Bagarius	B. bagarius
20	*Mystus tengra*	Siluriformes	Bagridae	Mystus	M. tengra

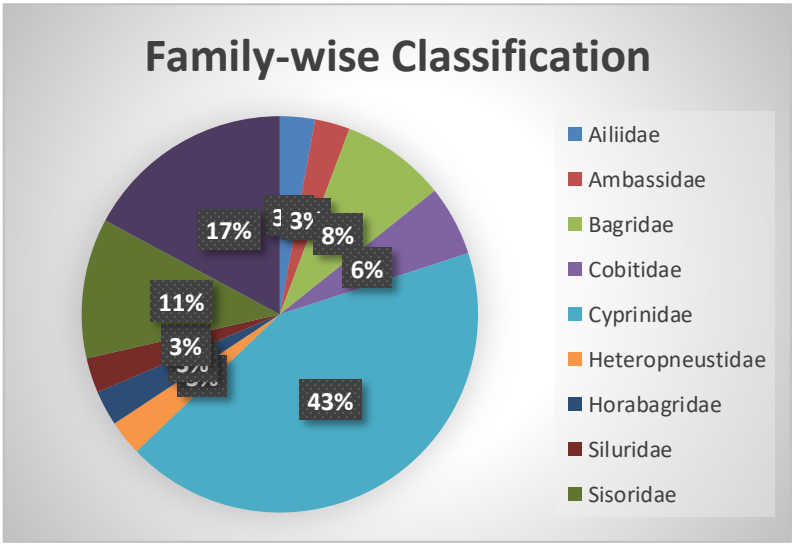
21	*Labeo boga*	Cypriniformes	Cyprinidae	Labeo	L. boga
22	*Heteropneustes fossilis*	Siluriformes	Heteropneustidae	Heteropneustes	H. fossilis
23	*Wallago attu*	Siluriformes	Siluridae	Wallago	W. attu
24	*Clupisoma montana*	Siluriformes	Ailiidae	Clupisoma	C. montana
25	*Pachypterus atherinoides*	Siluriformes	Horabagridae	Pachypterus	P. atherinoides
26	*Chanda nama*	Ambassiformes	Ambassidae	Chanda	C. nama
27	*Barilius guttatus*	Cypriniformes	Cyprinidae	Barilius	B. guttatus
28	*Garra annandalei*	Cypriniformes	Cyprinidae	Garra	G. annandalei
29	*Mystus cavasius*	Siluriformes	Bagridae	Mystus	M. cavasius
30	Fikra				
31	Chakra				
32	Cheli				
33	Khaisla				
34	Kauda				
35	Chela				

The table presents the taxonomic classification of 35 fish species recorded from the Koshi River, categorized into their respective orders, families, genera, and species. Among these, the order Cypriniformes is the most dominant, represented by 17 species (48.57%) that include important genera such as *Chagunius, Barilius, Labeo, Puntius, Tor, Aspidoparia, Cabdio, Devario,* and *Garra*. The second most abundant group is the Siluriformes, consisting of 11 species (31.43%), including catfishes from families like Bagridae (*Mystus, Sperata*), Sisoridae (*Bagarius, Glyptothorax, Gagata, Pseudecheneis*), Siluridae (*Wallago*), Ailiidae (*Clupisoma*), Horabagridae (*Pachypterus*), and Heteropneustidae (*Heteropneustes*). The order Ambassiformes is represented by a single species, *Chanda nama* (2.86%), belonging to the family Ambassidae.

In addition to these scientifically classified fishes, six species were documented only by their local names (*Fikra, Chakra, Cheli, Khaisla, Kauda,* and *Chela*), which account for 17.14% of the total. The presence of both large, commercially valuable fishes such as *Tor putitora* (golden mahseer), *Wallago attu* (wallago catfish), and *Bagarius bagarius* (goonch catfish), along with a high diversity of small indigenous species like *Barilius* and *Puntius*, reflects the rich biodiversity and ecological importance of the Koshi River. Overall, the data indicate that the riverine ecosystem is dominated by Cypriniformes and Siluriformes, while also revealing gaps in taxonomic knowledge for several locally known fishes.

Fig 1: Order and family-wise data disaggregation of fish species recorded in Koshi River





The order-wise distribution of fish species recorded from the Koshi River provides insights into the ichthyofaunal diversity of this important riverine ecosystem. The results clearly show that the order Cypriniformes dominates the fish community, contributing nearly half of the species (48.57%). This dominance reflects the ecological adaptability of cyprinids such as carps, minnows, and related species, which are well-suited to the flowing waters of large rivers. These fish play a critical role in maintaining ecosystem balance, serving as both primary consumers of algae and detritus as well as an essential food source for higher trophic levels, including predatory fish, birds, and humans.

The second most abundant order, Siluriformes, accounts for 31.43% of the total species. This group includes a wide variety of catfishes, many of which are benthic in nature and adapted to strong river currents. Their presence indicates a healthy benthic zone and contributes significantly to nutrient cycling by feeding on detritus, smaller fishes, and invertebrates. Siluriformes are also of high commercial value, supporting local fisheries and livelihoods in the Koshi River. The order Ambassiformes is represented by only a single species (2.86%), showing that its contribution to overall diversity is relatively low. However, its presence adds to the ecological complexity of the river system, as such species often occupy specialized niches in shallow or vegetated habitats. A notable portion of the recorded diversity (17.14%) remains taxonomically unidentified, represented only by local names.

From an ecological and environmental perspective, the dominance of Cypriniformes and Siluriformes suggests that the Koshi River provides a diverse range of habitats from fast-flowing riffles to deep pools that support species with varying ecological requirements. The presence of both commercially valuable large fishes like *Tor putitora* and *Bagarius bagarius*, alongside smaller indigenous species, indicates the river's role as a hotspot of biodiversity and a lifeline for local communities. Protecting this diversity is essential not only for sustaining fisheries and livelihoods but also for maintaining the ecological integrity of one of Nepal's most important river systems. Overall, this data suggests, Koshi River is highly dominated by Cypriniformes and Siluriformes, which together account for nearly 80% of the total fish diversity. This reflects a typical South Asian riverine fish community, where cyprinids and catfish form the ecological and economic foundation.

This family-wise Classification presents a visual summary of fish diversity, likely from a specific freshwater ecosystem. It categorizes fish species into nine distinct families, where the most dominant group is Cyprinidae, comprising 43% of the total. This family includes carps and minnows, which are crucial for maintaining ecological balance through their roles in herbivory and nutrient cycling. Siluridae follows with 17%, representing bottom-dwelling sheatfishes that contribute to benthic food web dynamics. Horabagridae (11%) and Bagriidae (8%) are catfish families, often serving as indicators of habitat quality and playing roles as mid-level or apex predators. Families like Cobitidae and Sisoridae (each 6%) include loaches and hillstream catfishes, respectively, which are adapted to fast-flowing waters and help aerate sediments. Smaller segments—Ailiidae, Ambassidae, and Heteropneustidae (each 3%)—represent species that are sensitive to pollution, inhabit low-oxygen environments, or thrive in slow-moving waters. Understanding this classification is vital for ecological research and conservation planning. Fish are not just aquatic inhabitants; they are bioindicators, ecosystem engineers, and essential components of food webs. Their presence and diversity reflect water quality, habitat structure, and seasonal dynamics.

2. Conservation Outreach Program:

For the conservation outreach program, an array of activities has been tailored, including: school and community awareness programs, development of IEC materials, art competitions, and drama for dolphin conservation.

2.1. Student-Led Drama on River Dolphin and Freshwater Conservation

As part of this project, we have implemented a variety of initiatives aimed at raising awareness and promoting conservation of the endangered River Dolphin (*Platanista gangetica*) and its freshwater habitat. One of the key outreach activities was the organization of a student-led drama performance designed to engage young audiences and encourage them to become advocates for freshwater biodiversity.

Two drama events were organized in local schools, with the primary objective of increasing knowledge about the River Dolphin's ecological importance, threats to its survival, and the need for conservation actions. In addition to imparting factual information, these events were carefully structured to inspire empathy and foster a sense of stewardship among students, ensuring that they view the dolphin not just as a species in need of protection, but as a symbol of healthy river ecosystems.

The project team played a central role in supporting the drama initiative. This included developing an engaging script and narration that incorporated real-life scenarios from local rivers and communities, providing logistical support for rehearsals, and guiding students on acting techniques. Before the public performance, a group of 10–15 students participated in practice sessions to refine their storytelling and make the narrative compelling and relatable.

The drama performances drew significant attention, with over 250 students, teachers, and school staff attending. The students acting in the play successfully brought the script to life by portraying realistic scenarios, illustrating conservation challenges, and demonstrating practical solutions to protect the River Dolphin and its habitat. The play's content was carefully tailored to the local context, making it both accessible and deeply meaningful to the audience.

Feedback from spectators was overwhelmingly positive; they found the drama to be informative, engaging, and entertaining, which helped maximize its educational impact. Beyond spreading awareness, this activity also helped empower participating students, enhancing their communication skills, confidence, and conservation knowledge. It encouraged them to take ownership of conservation messages, making them ambassadors for river health and biodiversity in their communities. It is expected to strengthen the profile of the River Dolphin as a flagship species, while cultivating a new generation of environmentally conscious citizens who can actively contribute to protecting freshwater ecosystems in the years to come.

Video link of the school drama performed at Koshi

https://drive.google.com/file/d/1WyCOadmGIshTFVrUvDbPtOWKWTrpLTxZ/view?usp=sharing

2.2. Art competition:

Art provides a powerful medium to communicate and engage communities with conservation messages. Building on the success of previous initiatives, we organized the art competition as a key activity to promote awareness about River Dolphin conservation and the importance of protecting their habitats. A total of three events were conducted, engaging over 90 students from local schools. The competition centered on the theme of "River Dolphin and Habitat Conservation," encouraging participants to creatively express their understanding of the species and its ecosystem. The students participated with great enthusiasm, demonstrating both creativity and an increasing awareness of riverine biodiversity. The activity received strong support from school administrations, who recognized the project's efforts in promoting dolphin conservation and actively facilitated participation. Winners were awarded medals, certificates, and dolphin-themed merchandise, providing positive reinforcement and further inspiring interest in wildlife conservation. Overall, the art competition not only fostered environmental awareness among students but also strengthened school-community engagement, amplified the conservation message of the project, and contributed to nurturing the next generation of conservation advocates for the River Dolphin.


River Guard

2.3. School Awareness Program

The River Dolphin, a freshwater species native to Nepal, is found only in three major river systems: the Koshi, Narayani, and Karnali Rivers, with the total national population estimated at fewer than 100 individuals. While frequent sightings of dolphins have been recorded in the Koshi and Karnali Rivers, only occasional sightings of one or two individuals have been reported in the Narayani River. Despite this, conservation and research efforts in Narayani have historically been minimal compared to the other two rivers, leaving a significant knowledge and awareness gap among local communities.

Recognizing this gap, our project focused not only on strengthening ongoing outreach activities in the Koshi River system but also on expanding educational programs to the Narayani River region, where dolphin conservation efforts had previously been almost non-existent. Through these activities, we aimed to create awareness, foster a conservation mindset among youths and communities, and encourage grassroots participation in protecting the River Dolphin and its habitat.

As part of our efforts to promote River Dolphin and freshwater conservation, we organized a school awareness program in the Koshi River. The program was conducted in eight schools, reaching a total of 470 students. Its main goal was to provide basic information about River Dolphins while emphasizing their ecological and environmental significance, current conservation status, existing challenges, and the role of youth in protecting their natural habitats.

Photographs: Citizen Scientist/River Guard facilitating the school-level awareness program as a resource person in different schools at the Koshi

We followed a standardized procedure for all sessions, ensuring consistency in delivery and messaging. We have been engaging citizen scientists and river guards as resource persons for these events. By drawing on their local ecological knowledge and providing them with opportunities to share their expertise, the program not only enhanced students' understanding but also built the capacity of these local stakeholders to become future conservation advocates within their communities. The sessions were interactive and well-received, with most students actively participating, asking questions, and engaging in discussions.

Based on pre- and post-assessment surveys, students demonstrated an impressive average knowledge gain of 80.79%. Among the participating schools, Shree Jhalpa Secondary School recorded the highest improvement (88.64%), followed by Shree Ganesh Secondary School (83.79%) and Shree Chandeshwori Secondary School (82.37%). Even schools with slightly higher baseline knowledge, such as Shree Prasiya Basic School, saw significant gains (72.22%). These results indicate that the program was highly effective in increasing conservation knowledge and inspiring students in the Koshi region to play a more active role in safeguarding River Dolphins and their habitats.

Table : Result of pre- and post-program effectiveness survey of school awareness program

School Awareness Program-Koshi				
S.N	Name	Pre-Assessment	Post-Assessment	Averaging
1	Shree Jhalpa Secondary School	7.95	96.59	88.64
2	Shree Kaushika Secondary School	7.40	87.32	79.92
3	Shree Sishu Jyoti Basic School	7.42	88.04	80.62
4	Shree Madhuban Secondary School	4.90	85.17	80.28
5	Shree Chandeshwori Secondary School	9.64	92.01	82.37
6	Shree Indreshwori Secondary School	5.79	84.30	78.51
7	Shree Prasiya Basic School	14.39	86.62	72.22
8	Shree Ganesh Secondary School	8.64	92.42	83.79
			Averaging	80.79

To address the knowledge gap in Narayani, we prioritized schools located near the river, organizing 7 awareness events that reached 301 students. Pre- and post-assessment surveys revealed a significant improvement in students' understanding of River Dolphin conservation, with an overall average knowledge gain of 86.08%. Among the schools, Rastriya Basic School showed the highest increase in knowledge (91.47%), closely followed by Blooming Bud Boarding School (90.58%). Other schools, including Shree Bal Jivan Jyoti School (86.67%) and Shree Shisir Secondary School (87.99%), also demonstrated substantial improvements. Even schools with relatively higher baseline awareness, such as Shree Yadav Secondary School, recorded notable progress (82.67%). These results highlight the program's success in building awareness and bridging a critical conservation knowledge gap in the Narayani River region, where prior efforts had been minimal. The Narayani outreach events were particularly significant, as they brought conservation messaging to a river system where conservation initiatives had previously been lacking. The remarkable knowledge gain among students underscores the effectiveness of these awareness programs and highlights the potential for building a strong conservation foundation in this region.

Table: Result of pre- and post-program effectiveness survey of school awareness program

School Awareness Program-Narayani				
S.N	Name	Pre-Assessment	Post-Assessment	Averaging
1	Blooming Bud Boarding School	2.60	93.18	90.58

2	Rastriya Basic School	1.40	92.87	91.47
3	Shree Bhulkepani Basic School	7.62	90.42	82.80
4	Shree Yadav Secondary School	9.94	92.61	82.67
5	Shree Bal Jivan Jyoti School	2.73	89.39	86.67
6	Shree Shisir Secondary School	2.60	90.58	87.99
7	Shree Narayani Basic School	5.70	86.10	80.39
			Averaging	86.08

The significant improvement in knowledge reflects the project team's dedicated efforts, support from citizen scientists, and active engagement by school staff. Students expressed enthusiasm and a renewed sense of responsibility towards River Dolphin conservation. Encouragingly, many pledged to share their knowledge and contribute to local conservation efforts. This school-based outreach is a key component of a broader strategy to instill conservation values in youth and foster community-led support for freshwater biodiversity conservation.

Photographs: River Guard and Himalayan Nature's staff facilitate the school-level awareness program in Chitwan, Narayani River

2.4. Community Awareness Program

Through this project, we organized a series of community awareness programs in the Koshi and Narayani rivers, two key habitats of the endangered River Dolphin in Nepal. Despite the presence of dolphins, conservation initiatives in these areas had been limited, creating an important opportunity for us to step in, especially given our strong presence in the region. In total, 12 awareness programs were conducted—5 in Koshi and 7 in Narayani—reaching 398 participants (154 in Koshi and 244 in Narayani). Most participants came from river-dependent, ethnic, and farming communities, reflecting the program's focus on people who interact most closely with the river ecosystem. Notably, female participation was high at 63.81% (254 women and 144 men). Locations were carefully chosen based on communities' dependence on riverine resources, particularly fishing, ensuring the program was both relevant and impactful. Sessions covered:

- The ecological and environmental importance of River Dolphins
- Current threats and conservation challenges
- National laws and protective measures
- Community roles and responsibilities in conservation

These activities aimed to educate, engage, and empower local communities to take an active role in protecting River Dolphins and their habitats. By tailoring the content to local needs and cultural contexts, the program helped foster ownership and long-term commitment to conservation. Given the heavy reliance of these communities on river resources, the initiative was particularly timely. Increasing awareness is expected to lead to more responsible resource use, stronger advocacy, and community-driven conservation actions, creating a solid foundation for the long-term protection of River Dolphins in Nepal. To assess the effectiveness of the awareness program, pre-and post-effectiveness survey was conducted.

Community Awareness Program-River Dolphin along the Koshi River-Sunsari				
S.N	**Name**	**Pre-Assessment**	**Post-Assessment**	**Averaging**
1	Bhantabari	18.55	82.18	63.63
2	Haripur	10.61	86.36	75.75
3	Paschim Kusaha	14.20	74.72	60.51
4	Madhuban	8.24	80.11	71.87
5	Barrage	13.77	76.88	63.11
		Averaging		66.97944
Community Awareness Program-River Dolphin along Narayani River-Chitwan				
S.N	**Name**	**Pre-Assessment**	**Post-Assessment**	**Averaging**
1	Camping Site	4.04	76.94	72.90
2	Bichtole	16.23	78.90	62.66
3	Kotihom	8.24	85.51	77.27
4	Keulani	16.06	86.06	70.00
5	Tribeni Bazar	9.94	75.57	65.63
6	Prasaiya	13.35	75.85	62.50
7	Shivapurgadhi	11.87	75.76	63.89
		Averaging		**67.83**

The community awareness program on River Dolphins along the Koshi River (Sunsari) and Narayani River (Chitwan) has led to a remarkable increase in conservation knowledge among participants. In Sunsari, average awareness levels rose from 11.87% before the program to 80.45% afterward, an impressive improvement of 68.58%. Similarly, in Chitwan, awareness levels increased from an average of 11.82% to 79.80%, a gain of 67.98 %. The results of the community awareness program on River Dolphins along the Koshi River (Sunsari) and Narayani River (Chitwan) demonstrate a remarkable increase in conservation knowledge among participants. In Sunsari, pre-awareness levels averaged 11.87%, which increased to 80.45% post-program, reflecting an overall improvement of 68.58%.

Similarly, Chitwan communities started with an average awareness level of 11.82%, which surged to 79.80%, representing a 67.98% improvement. These results show that focused, site-specific activities are highly effective in building conservation understanding and encouraging community ownership. Overall, the program achieved an average improvement of around 68% across both regions. This program demonstrates that investing in grassroots awareness can rapidly transform community perspectives, making local people active stewards of their natural ecosystems. The results highlight strong community readiness for participation, laying a solid foundation for behavior change, long-term river dolphin conservation, and a stronger connection between scientific conservation strategies and local action.

Photograph: Community awareness program conducted at different settlements, prioritizing farmers, river-dependent communities of the Koshi and Narayani River

3. Distribution of Educational Materials (posters, brochures, story books):

As part of our River Dolphin conservation initiation, we distributed a variety of educational materials, including posters, brochures, and storybooks, to schools, community groups, and local stakeholders in the Koshi and Narayani River regions. These materials were designed to be visually engaging and easy to understand, ensuring that information about River Dolphin ecology, threats, and conservation measures was accessible to all age groups. The distribution of these resources has played a key role in raising awareness among children, teachers, and river-dependent communities, helping them understand the importance of protecting the River Dolphin and their habitats. By using storytelling and illustrations, the materials have sparked curiosity and interest, particularly among younger audiences, making conservation messages more relatable and impactful.

This initiative has also strengthened community ownership of conservation efforts by providing clear information on how individuals can actively contribute. Beyond immediate engagement, the materials are designed to have a lasting impact, as they will continue to educate and inspire long after the program activities conclude. By combining outreach efforts with the distribution of these resources, we have ensured that conservation messages reach a wider audience and remain present in local communities. This approach supports the development of a well-informed network of conservation advocates and lays the foundation for long-term behavioral change and sustainable protection of Nepal's River Dolphin.

Photographs: Educational Materials (brochures and storybooks) developed under the River Dolphin were distributed at different schools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4. Monitoring of River Dolphin habitat by the River Guard:

The trained River Guard has been actively involved in regular monitoring of the dolphin habitat, working in close coordination with other conservation stakeholders. During these monitoring activities, the River Guard records key information, including dolphin sightings, habitat conditions, potential threats, and other ecological observations. A particularly notable achievement during this monitoring was the recording of a River Dolphin in the upper section of the Koshi River, approximately 30 km upstream of the Koshi Barrage near Madhauban. This observation is highly significant, as it demonstrates the species' presence in an area previously thought to be largely inaccessible due to the barrier posed by the barrage. Such findings not only provide critical data for understanding dolphin distribution and movement patterns but also underscore the importance of consistent monitoring in informing conservation strategies and mitigating potential threats. The recording reinforces the value of the River Guard's work in safeguarding these majestic species and contributes directly to long-term river dolphin conservation efforts.

Photograph: River Guard (RG) members recorded the River Dolphin in the upper section of the Koshi Barrage in Madhuban, collected illegal fishing gears, set up a camera trap and monitored by RG in the Koshi River


RIVER GUARD GROUP
Rufford

FUTURE PLANS

1. Expanding school and community awareness events
2. Post-monsoon dolphin survey,
3. Assessment of water quality, and survey of prey species
4. Final Report preparation and submission