

## Darwin Initiative Main and Post Project Annual Report

To be completed with reference to the “Writing a Darwin Report” guidance: (<http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms>). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

**Submission Deadline: 30<sup>th</sup> April 2019**

### Darwin Project Information

Project reference	24-015
Project title	Community conservation of Chitwan National Park's freshwater ecosystems and gharials
Host country/ies	Nepal
Lead organisation	Zoological Society of London
Partner institution(s)	Department of National Parks and Wildlife Conservation (DNPWC), National Trust for Nature Conservation (NTNC), Himalayan Nature (HN)
Darwin grant value	<b>£ 397,692</b>
Start/end dates of project	<b>15 June 2017 - 31 March 2021</b>
Reporting period (e.g., Apr 2018 – Mar 2019) and number (e.g., Annual Report 1, 2, 3)	April 2018 – March 2019
Project Leader name	Hem Baral
Project website/blog/Twitter	<a href="https://www.zsl.org/community-conservation-of-chitwan-national-park%E2%80%99s-freshwater-ecosystems-and-gharials">https://www.zsl.org/community-conservation-of-chitwan-national-park%E2%80%99s-freshwater-ecosystems-and-gharials</a> <a href="https://www.zsl.org/blogs/asia-conservation-programme/community-crocodilian-coexistence">https://www.zsl.org/blogs/asia-conservation-programme/community-crocodilian-coexistence</a>
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### 1. Project rationale

Across the world, the biodiversity and functionality of freshwater ecosystems are declining more rapidly than terrestrial ecosystems. This is mainly due to over exploitation, water pollution, flow modification, destruction or degradation of habitat and invasion by exotic species. Freshwater biodiversity protection and conservation faces serious challenges, due to its inevitable connectivity to pollution upstream, in the surrounding land, the riparian zone, and in downstream reaches in the case of migrating aquatic fauna. Freshwater biodiversity receives limited attention and funding for conservation and management, despite its vital role for human health.

In Nepal, the loss of freshwater species is almost double the loss of terrestrial species in the last 50 years (Living Planet Report 2016). The Narayani and Rapti rivers within Chitwan National Park (CNP) are formally protected but are still affected by land-use change, haphazard river material extraction upstream, riverbank disturbance, and harmful and unsustainable fishing

practices. This has caused dramatic declines in water quality and fish stocks, affecting the health, income and food security of local communities as well as the Critically Endangered gharials. Gharials are extinct in almost all of their historic range with their current distribution confined to only a few river systems in Nepal and India. In Nepal, gharials are confined to the Narayani, Rapti, Karnali and Babai rivers only. The conservation needs of gharials have been highlighted by the Department of National Parks and Wildlife Conservation in its 'Gharial Conservation Action Plan 2012-2016' and by national experts.

Gharials play the ecological role of top predators in the river ecosystem and are a key indicator of a healthy freshwater ecosystem – upon which the socio-economic wellbeing of local communities depends. The indigenous Bote, Musahar and Tharu communities along the Rapti and Narayani rivers rely heavily upon these rivers for their food and income.

This project aims to reverse the current rate of decline in the gharial population through: robust monitoring of the river ecosystem and gharial population; providing knowledge for the formulation of a river ecosystem management plan; increasing river protection through forming community-based protection units; and enhancing the effectiveness of the Gharial Conservation Breeding Centre (GCBC). By restoring the ecosystem health of Narayani and Rapti rivers, the project aims to deliver positive benefits to the local communities dependent upon these river ecosystems for food (fish) and water. The project also supports indigenous fish-dependent communities to enhance their food security as well as to raise their income through developing their capacity in sustainable aquaculture livelihoods.

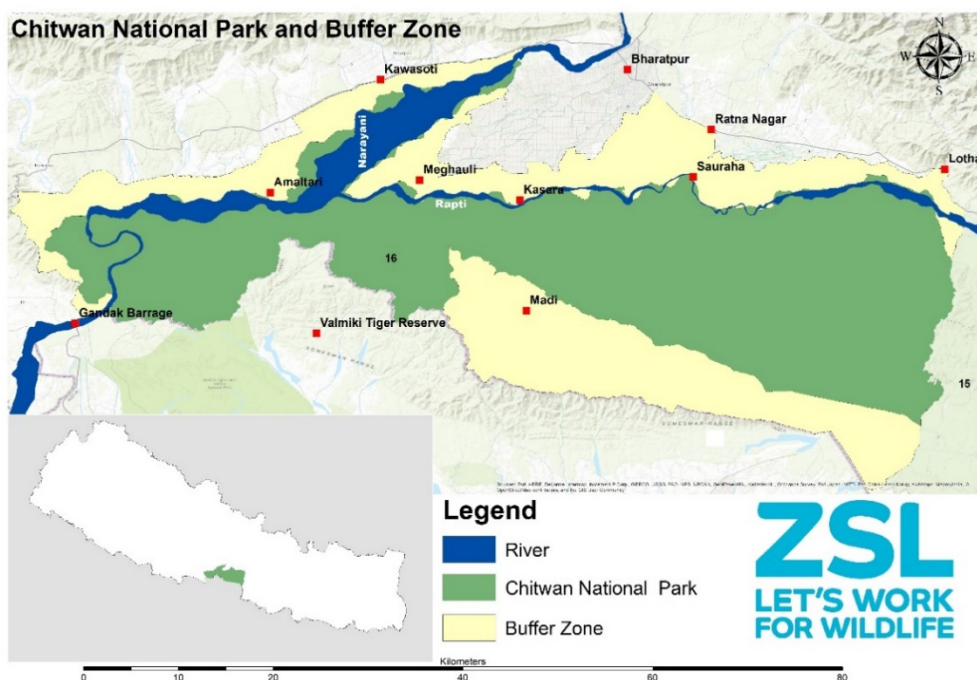


Figure: Showing the Rapti and Narayani river system in Chitwan National Park and adjoining areas.

## 2. Project partnerships

ZSL has built a firm relationship with its partners and stakeholders for biodiversity conservation and protection in Nepal. This partnership includes the Department of National Parks and Wildlife Conservation (DNPWC), the National Trust for Nature Conservation (NTNC), and Himalayan Nature (HN). ZSL is facilitating improved communication and coordination for project implementation among all partners, as planned. A Project Coordination Committee (PCC) chaired by the Deputy Director General of DNPWC, with section heads of DNPWC and the Project Manager from ZSL as members has been formed at central level. The PCC works as the main governing entity providing guidance for effective implementation of the project activities, and it conducts regular monitoring.

A Project Management Unit (PMU) was formed in CNP for project implementation, chaired by the Chief Conservation Officer of CNP with representatives from NTNC, HN and ZSL as members. Representation of community members, Buffer Zone Users Committees

representatives and local government and protection units is ensured in decision making and project implementation. The PMUs are responsible for coordination among partners, Buffer Zone Management Committees and local communities, facilitating project activities, monitoring progress and reporting to PCC.

ZSL along with all the project partners have maintained very positive relationships with the local communities, who are direct project beneficiaries with a key role in ensuring the sustainability of the project activities. Also, ZSL and project partners have involved the Fishery Development Centre as a key stakeholder (the government authority to promote and develop sustainable fisheries in the country).

### **3. Project progress**

#### **3.1 Progress in carrying out project Activities**

*Output 1: Improved river ecosystem management delivered through improved management plans and environmental policy based on a robust Gharial and riverine ecosystem monitoring programme.*

During this reporting period, gharial and river monitoring guidelines were revised according to the survey finding and needs (Supplementary Document 1). These were tested on site during the 2<sup>nd</sup> Annual Gharial monitoring survey (Activity 1.9 - Completed). Annual monitoring of gharials was completed, and the preliminary results showed 230 Gharials in the Rapti and Narayani Rivers, an increase of 5% compared to the baseline (219) (Activity 1.8 – Completed). The report of Gharial Survey conducted in year 1 has been provided as Supplementary Document 2, whereas the survey report for year 2 is under preparation and will be shared by next reporting period. An informal meeting was organised at Chitwan National Park to share the findings of the survey results as well as the revised Gharial and River Monitoring Guidelines which has broadly agreed on the revised annual monitoring plan. A sharing meeting with park authorities and wider stakeholders regarding annual monitoring plan will be conducted in year 3 (Activity -1.10 – completed for this year/Planned in year 3)

ZSL trained 64 participants on the use of the monitoring guidelines, including national park staff, conservation stakeholders and Community-Based Anti-poaching Units (CBAPUs) (Activity 1.7 – Completed; Annex 4.1). We have recruited 1 PhD and 3 MSc students and 2 EDGE Fellows. The project will recruit one more MSc student in Year 3. The PhD candidate was involved in the gharial survey and is conducting research to understand the dispersal behaviour of wild and released gharials and survival rate of released gharials (Activity 1.2 – In Progress). Two papers are currently being drafted, one about the population of gharials and their distribution another about the local ecological knowledge of local communities on gharials (Activity 1.11 – In progress).

ZSL organised a meeting of conservation stakeholders, in Sauraha, Chitwan, attended by the representatives of DNPWC, NTNC, HN, BZs and the protection unit of CNP. It was held to support the DNPWC in the development of the *River Ecosystem Management Plan* (Activity 1.12 – Completed). The conclusions from the meeting provided the basis for two workshops to collect further inputs for this *River Ecosystem Management Plan* (Supplementary Document 3). A total of 186 people participated during the entire consultation process, representing several relevant stakeholders including: community members from river-dependent communities, Buffer Zone Users' Committees/User Groups and Forest Users' Groups, park authorities, experts from NTNC, and representatives from HN. One workshop was held in Sauraha and another in Amaltari (Activity 1.13 – Completed; Annex 4.2).

*Output 2: Threats to fish stocks and gharials are reduced through protection provided by 10 Community Based Anti-Poaching Units (CBAPUs) patrolling sensitive riverine zones in the Narayani and Rapti watersheds to protect the area from unsustainable fishing, poaching and other damaging and unsustainable uses of the river.*

A total of 66 members voluntarily joined forming 11 CBAPUs, named as Gharial Guard Groups. During the first year, each Gharial Guard Group had 3 members, and this year 3 more community members joined each of the 11 Gharial Guard Groups (Annex 4.3). A total of 59 of these members were trained by organising a refresher training, to enable them to monitor river ecosystems and gharials (Annex 4.4). Subsequently, the Gharial Guard Groups conducted 132 river patrols during this reporting period (Activity 2.4 – In progress).

*Output 3: Increased post-release survival of Gharials from the Chitwan Gharial conservation Breeding Centre (GCBC) delivered through implementing improved husbandry and release protocols, and post-release monitoring.*

The project has been supporting improvements in the GCBC infrastructure, especially to enhance the visitors' experience through the management of Gharial Information Centre and increase egg laying by supporting GCBC to create and maintain artificial sand banks. ZSL supported Information Centre publications of various education and awareness-raising materials (e.g. information boards, posters etc). ZSL through this project also provided GCBC a set of Chip reader and laptop for GCBC to facilitate their data recording and management work (Activity 3.2 – Completed).

National experts in collaboration with project staff and national park staff reviewed the existing egg collection practice in GCBC and used this to revise guidelines (Activity 3.3 – Completed; Supplementary Document 4). Project staff, in consultation with experts and with support from a consultant, are preparing gharial husbandry and release guidelines for Nepal. These national guidelines will be prepared by Q2 of year 3 and implemented by end of year 3 (Activity 3.4 – In progress). An expert in herpetology from ZSL London Zoo conducted gharial husbandry training for 16 GCBC staff and two staff from conservation stakeholders during this reporting period (Activity 3.5 – Completed; Annex 4.5).

A total of 100 juvenile gharials (4-5 years) were released from GCBC into the Rapti river. Twenty of these gharials were tagged with GPS satellite collars (Annex 4.6); however, all 100 were marked uniquely so they can be identified and monitored in the wild. The 20 collared gharials are being continuously monitored, while other 80 gharial will be monitored by national park staff as they come out to bask on the sand banks (Activity 3.6 – In progress).

*Output 4: Food security of local communities improved through implementing sustainable fishing and reducing the dependence of local communities on fishing through generating sustainable aquaculture livelihoods.*

During this reporting period, three additional areas suitable for the establishment of community managed ponds were identified through wide consultation with stakeholders, including the national park. To manage these, three additional women-led committees were established, two in Budi Rapti Buffer Zone Users Committee and one in Khagendramali Buffer Zone Users Committee, increasing the total from five to eight community-managed fishponds, all led by women (Supplementary Document 5). A total of 164 households have been supported by the project under these eight community fishpond management groups (Activity 4.5 - Completed). Additionally, the project supported these community fishponds to access markets for their fish products.

Two community workshops in this reporting period shared knowledge on sustainable fishing and gharial conservation with the local communities, reaching 162 households (Activity 4.8 – In progress; Annex 4.7).

The project supported the establishment of five community conservation engagement centres (drop-in centres) in upstream communities to engage and inform them on the need for conservation of the freshwater ecosystem, including the gharials (Annex 4.8; Supplementary Document 6). These community conservation engagement centres are established in Lamicharu Buffer Zone User Committee' Office, Jatayu Restaurant, Khagendramalli Bufferzone User Committee' Office, Bote Derai Tal management committee and Jhuwani Community Library. These centres are now recognized as information centres for gharial and freshwater ecosystem conservation; through them, 6000 brochures and 2000 posters detailing gharial conservation messages have been prepared and are being disseminated, as are 50 mounted posters on gharial conservation, which will also reach the schools across the Buffer zones areas in the upstream of the Rapti and Narayani rivers (Activity 4.7 – In progress; Supplementary Document 7).

### **3.2 Progress towards project Outputs**

The project has been progressing well towards achieving its set outputs. Some minor delays have been faced but the project partners are coordinating well and committed to achieving the project outputs within the set timeframe of the project. To do this, the project partners are meeting regularly and planning as needed.

***Output 1: Improved river ecosystem management delivered through improved management plans and environmental policy based on a robust Gharial and riverine ecosystem monitoring programme***

The project has established an ecological baseline for prey fish stocks (number of fishes per 100 square meter) and for biodiversity (measured by Shannon-Weiner diversity index ( $H'$ ) and Shannon equability index ( $J'$ )). The data are available in the report "**Fish Diversity, Stock Assessment and Water Quality in Lower Stretch of Rapti and Narayani River**" which has been shared during project first year's annual reporting. These baselines will be compared with the results of the survey conducted in year 4. Data has been collected in year one and year 2 to map the distribution of gharials which is being analysed and gharial distribution map for year 1 and 2 will be shared on year 3 and change recorded in year 3 and 4 subsequently. (Indicator 1.1).

The gharial and river ecosystem monitoring guidelines have been finalised after review completed based on the results of successful monitoring in year 1. This meets the target set by Indicator 1.2. (Gharial and river ecosystem monitoring guidelines attached as Supplementary Document 1). The project has supported three MSc students during this year, all of them have completed their study and will shortly submit their reports to their enrolled universities. To meet our revised target of supporting four MSc students, in year 3 we plan to support one further MSc student project. Additionally, the project has enrolled one PhD student, who is undertaking her research on Rapti and Narayani river to understand the dispersal and survival of gharial released from the head-start programme of the Gharial Conservation and Breeding Centre (GCBC) (Indicator 1.3). 1 EGDE fellow has been recruited to work on gharial conservation in Chitwan, and ZSL has recruited an additional EDGE fellow to work on gharial conservation in the Babai and Karnali rivers in Bardia National Park (<https://www.edgeofexistence.org/edge-fellows/>) (Indicator 1.4).

A survey in year 1 and year 2 mapped the threats and impacts on the gharial population and fish biodiversity, including illegal fishing. However, due to the time needed for data processing and analysis the final report on threat and impact mapping cannot yet be shared during this reporting period – this will be prepared and shared in the next annual report (Indicator 1.5). During this reporting period, ZSL and the project partners have been successful in preparing the River Ecosystem Management Plan for Chitwan National Park (Supplementary Document 3), with extensive engagement of wider stakeholders including National Park Office, Buffer Zone communities, fishermen and local people. All the project partners are working to update the CNP Management Plan to include strengthened policies and sustainable use of riverine biodiversity. This is on track to be achieved by the end of the project. CNP and the DNPWC are the key project partners to help achieve this target (Indicator 1.6).

***Output 2: Threats to fish stocks and gharials are reduced through protection provided by 10 Community-Based Anti-Poaching Units (CBAPUs) patrolling sensitive riverine zones in the Narayani and Rapti watersheds to protect the area from unsustainable fishing, poaching and other damaging and unsustainable uses of the river.***

As well as the 10 Gharial Guard Groups established by the project, the communities have formed one additional CBAPU as a valuable addition, making a total of 11 CBAPUs proactively supporting gharial conservation along the Rapti and Narayani rivers. A total of 66 community members have voluntarily joined the Groups; 6 per each Group (Annex 4.3). Additional to the 27 members trained in year 1 in river patrolling and gharial monitoring, this year 59 CBAPU members were trained (Annex 4.4); some members repeating the training programme (Indicator 2.1).

CBAPUs have started regular river patrolling, this year total of 132 river patrols have been conducted. This is two patrols per month during the dry season, opportunities to increase patrol numbers during the monsoon season - when river patrolling is made more difficult – are being explored; including efforts to increase the motivation of community members. (Indicator 2.2).

Likewise, the project has usefully worked to enhance the collaboration of CBAPUs and Park Authorities. This resulted in regular information exchange between CBAPUs and Park

Authorities. During this reporting period, CBAPUs provided information of 10 incidents of illegal fishing, which resulted in arrests of 27 people, and 4 incidents of illegal river material extraction, which resulted in arrests of 13 people (Indicator 2.3). The CBAPUs will use the map of sensitive riverine zones (prepared through threat and impact mapping due to be completed in Q1 of year 3) to conduct patrolling in 100% of these identified sensitive zones, by the end of year 3 (Indicator 2.4). The base line and the percentage change data on illegal fishing incidents will be made available by the end of year 4 (Indicator 2.5). During this reporting period, no incidence of gharial poaching has been recorded in the project sites (Indicator 2.6).

***Output 3: Increased post-release survival of gharials from the Chitwan Gharial Conservation Breeding Centre (GCBC) delivered through implementing improved husbandry and release protocols, and post-release monitoring.***

The project has been successful in improving the infrastructure of the GCBC, providing the information centre with various educational and awareness-raising materials including information boards and posters and digital display. The additional artificial sand banks provided by the project have successfully increased the egg laying inside GCBC. The project provided a chip reader and laptop to GCBC for record keeping and management (Indicator 3.1).

Gharial husbandry and release guidelines are under preparation, project staff and partners are consulting with experts to prepare the guideline. The guidelines will be prepared by Q2 of year 3 and will be implemented at GCBC by the end of year 3 (Indicator 3.2). All GCBC Staff have been trained by the experts in herpetology husbandry and release (Annex 4.5), additionally, staffs from project partners (NTNC and HN) were also trained enabling them to support GCBC in future (Indicator 3.3). By reporting period, 100 gharials were tagged and released from GCBC in to Rapti. In addition, 20 of these 100 head starts were tagged with satellite GPS collars, these will be monitored for the rest of the project to know their survival success (Indicator 3.4; Annex 4.6). The change in mortality of released gharial head start will be recorded throughout the project and at the end, mortality rate from year 4 will be compared to baseline (Indicator 3.5).

***Output 4: Food security of local communities improved through implementing sustainable fishing and reducing the dependence of local communities on fishing through generating sustainable aquaculture livelihoods.***

During this reporting period, a total of 164 households, primarily from indigenous fishing communities, are engaged in eight community fishponds across the buffer zone of Chitwan National Park. They have been managing the fishponds for more than a year now and have started to harvest their first batch of fish. Some of the community fishpond groups are being joined by additional members, which will increase the total number of households engaged in these. The groups are also being supported by the Fishery Development Centre, Nepal Government, local government and the Buffer Zone Users' Committee (Indicator 4.1; Annex Supplementary Document 5, Annex 4.9). A rough estimate of 18% increase in average household income has been reported for these 164 households – this figure will be firmed up by the next annual reporting period, once the communities do the accounting of their profit and expenditure and share their income by the end of fiscal year in Nepal (mid-July) (Indicator 4.2). In total, the project has successfully established five drop-in centres in upstream communities, which on an average are visited by 25 persons in a day (Indicator 4.3; Supplementary Document 6 and 7; Annex 4.8). Achievement against the remaining indicators (4.4 and 4.5) will be reported in year 3 and year 4.

### **3.3 Progress towards the project Outcome**

After the second year of implementation, the project has made considerable progress towards achieving the desired project outcome (which is "Health of the Narayani and Rapti river ecosystems improved, with increased fish stocks, and stabilised Gharial population, supported by local communities benefiting from sustainable livelihoods"). The project management team and the partners agree that the indicators set to measure the achievement of this outcome are adequate, and despite some minor delays in delivering some of the activities against the proposed time frame, the project will achieve its outcome by the end of the funding. Also, the engagement of various partners like NTNC, DNPWC, Chitwan National Park, Buffer Zone Management Committee, Local government, and the Fishery Development Centre will help to enhance the sustainability of the project's achievements.



Gharials were recorded in 12 out of 13 monitoring sections during the survey in year 1 (Supplementary Document 1), while only 118 segments out of 1088 were recorded with gharial direct presence. The data collected in year 1 and year 2 will produce a detailed gharial habitat utilisation map, showing the annual change (increment) in habitat utilisation, which will be prepared by year 4 (Indicator 0.1). The preliminary data from the annual gharial survey in year 2 has shown a 5% increase in gharial population. A detailed report of the year 2 survey will be provided with the next report as the data are being managed and analysed in detail, which is expected to be completed by the end of May 2019 (Indicator 0.4).

An increase in fish stocks can be shown by a change in the catch per unit effort of local fishers: a total of 50% of fishermen has valid fishing license and out of them 60% of them have started recording and reporting the weight of each catch (Indicator 0.2). Average fisherman's catch per effort in Rapti is 445 grams per one effort and for Narayani is 732 grams per one effort. The change (increment) in fishermen' catch for effort will be reported in subsequent year (Indicator 0.3).

During this reporting period, the river ecosystem management plan has been prepared (Supplementary Document 3) through engaging wider stakeholders, the gharial and river monitoring guidelines have been revised and finalised, and the egg collection protocol reviewed and prepared ( Supplementary Document 4). The project is in regular coordination DNPWC and Chitwan National Park to integrate these into the Chitwan National Park's Management Plan which will be achieved by end of year 4 (Indicator 0.5).

Furthermore, the project has successfully engaged 164 households from indigenous communities, provided them with seed money to set up the 8-community managed fishponds across the buffer zone of Chitwan National Park (Supplementary Document 5). Preliminary reports suggest that these households are seeing 18% increase in their average income from fishing (Indicator 0.6).

### 3.4 Monitoring of assumptions

	Outcome Assumptions	Comments
Assumption 1	A positive trend in these key indicators indicates an overall increase in the biodiversity value of these river ecosystems. This method has been used successfully in the Chambal river.	This assumption remains reasonable.
Assumption 2	Positive results in all ecological indicators indicates that successful ecosystem restoration has taken place	This assumption remains reasonable.
Assumption 3	Relevant authorities show continued commitment to implement robust management plans and monitoring programmes	DNPWC and CNP authorities are highly committed and gharial conservation has been the priority programme. Since the start of our project the federal ministry has also shown their concern and support to the programme.

	Output 1 Assumptions	Comments
Assumption 1	Monitoring programme sustainably institutionalised by DNPWC in the long term	This assumption remains reasonable. DNPWC has prepared the Gharial Conservation Action Plan. DNPWC played a crucial role in preparation of the gharial and river monitoring guidelines. DNPWC have ownership of documents prepared by the project.
Assumption 2	DNPWC continues to have adequate resources to implement the required	This assumption remains reasonable.

	changes in all the relevant areas affecting the riverine ecosystem in the Narayani and Rapti watersheds	
Assumption 3	Improved plans and policy are effectively translated into improved management	This assumption remains reasonable.
Assumption 4	Management plan is effectively implemented by DNPWC	This assumption remains reasonable.

	Output 2 Assumptions	Comments
Assumption 1	There will be an adequate number of suitable CBAPU applicants	There were an adequate number of suitable applicants.
Assumption 2	Sufficient number and diversity of community members are willing to participate in CBAPUs, the community workshops explaining and demonstrating the benefits of the CBAPU concept will support this.	This assumption remains reasonable.
Assumption 3	That CBAPUs will use the towers and that they will be effective in increasing chances of spotting poacher activity	This assumption remains reasonable.

	Output 3 Assumptions	Comments
Assumption 1	Factors unrelated to the release procedures are not the primary cause of released gharial mortality	This assumption remains reasonable.
Assumption 2	Factors relating to post-release mortality are identified and adequately addressed through other project Outputs, specifically monitoring	This assumption remains reasonable. 100 gharials tagged of which 20 are tagged with satellite GPS collar. Post-release mortality monitoring has begun.

	Output 4 Assumptions	Comments
Assumption 1	Aquaculture combined with increased awareness and strengthened protected area management disincentives illegal, and harmful fishing practices	This assumption remains reasonable.
Assumption 2	Sustainable fishing increases the food security of local communities	This assumption remains reasonable.
Assumption 3	Communities have the will to manage their resources sustainably long-term	This assumption remains reasonable.
Assumption 4	Unequal benefit sharing, corruption and theft do not fundamentally undermine community aquaculture	This assumption remains reasonable.



### **3.5 Impact: achievement of positive impact on biodiversity and poverty alleviation**

Target Impact: Narayani and Rapti river ecosystems are protected and restored, with the recovered gharial populations safeguarded and viable long-term, and providing ecosystem services to local fishing communities practicing sustainable livelihoods, reducing poverty.

The project has contributed to the recovery of gharial populations. The increase of 5% in the wild gharial population (Indicator 0.4) is a result of the project's support in enhancing protection through regular community patrolling (Indicator 2.1, 2.2, 2.3 and 2.6), increasing community awareness of gharial conservation (Indicator 4.3, 4.5 and Activity 3.3), as well as through enhancing their livelihood through the eight community fishponds in fish-dependent indigenous communities (Indicator 4.1 and 4.4).

The focus on the Narayani and Rapti river systems makes this a major contribution towards gharial recovery, as these two river systems harbour the largest gharial population in Nepal and are highly significant in terms of global population.

The project is also making a major contribution to human development and wellbeing with the river-dependent communities near Rapti and Narayani river system, as shown by the estimated 18% increase in average income of 164 households (Indicator 4.2). Currently, the declining river quality and the fish stock adversely impacts the well-being of these communities, leading them to put further pressure on the already declining fish stock and river resources. This in turn undermines economic development, hampers community wellbeing and contributes to further marginalisation of these groups. Supporting sustainable alternative livelihoods for local communities increases their wellbeing in the short-term, provides for greater levels of well-being, which are sustainable in the long-term, and also increases incentives to conserve river ecosystems and the flora and fauna dependent on it - including gharials.

Also, the community members involved in management of community fishponds have reported to project staff (pers. comms) that they are fishing in rivers less. The project will work towards quantifying this reduced dependency of community members on rivers for fish and seek to support this trend through further support to the communities to manage the community fishponds.

## **4. Contribution to the Global Goals for Sustainable Development (SDGs)**

The following SDGs are relevant to the project.

Goal 1: No poverty: The project has supported the formation of eight women-led committees to manage the community fishponds which has resulted in 18% increase in income from aquaculture for 164 households from indigenous communities dependent upon fishing and river resources. Seed money and training on aquaculture has been provided to these eight groups, to enable long-term income generation.

Goal 3: Good health and wellbeing: Through the eight fishponds, the project is supporting a secure source of food as well as income for local communities, contributing to their health and wellbeing.

Goal 5: Gender equality: The membership of the women-led community fishponds established under the project, consists of 76% females from indigenous communities. This promotes women's role in the community and in income generating activities specifically.

Goal 6: Clean water and sanitation: contribution to this goal at this stage cannot be quantified but the project aims to restore the river quality and ecosystem through its partnership work on a robust river management plan providing for improved water quality.

Goal 11: Sustainable cities and communities: The project activities have contributed towards sustainable communities through the development of a sustainable community governance mechanism for the community-managed fishponds.

Goal 12: Responsible consumption and production: Communities have reported to project staff (pers comms) that their frequency of fishing in rivers has decreased as they have started to harvest the fish from community-managed fishponds.

Goal 15: Life on Land: Gharial and fish monitoring surveys show an increase in gharial population, while the upgrades to the GCBC provide long-term infrastructure for gharial conservation and population recovery.

Goal 17: Partnership for the goals: Close partnerships have been built among the communities, conservation stakeholders and government agencies to carry out the activities that contributes to the goals.

## 5. Project support to the Conventions, Treaties or Agreements

S.N.	Convention, treaty, agreement	Project contribution to meet national obligations
1	Convention of Biological Diversity	<p>The project contributes to following Aichi Biodiversity Targets:</p> <p>Target 5: we are working to reduce habitat loss, and improve quality through our work with upstream communities, construction of sandbanks at the GCBC, and work with partners on the River Ecosystem Management Plan (Indicator 0.1)</p> <p>Target 6 and 7: We are working to train local people in sustainable aquaculture, so they can manage fish stocks in the community fishponds, while also taking pressure off the rivers' fish, to avoid overfishing and ensure ecosystem health. (Indicator 0.2, 0.3, 0.6)</p> <p>Target 8: We are working to increase the water quality, through our work with partners on the River Ecosystem Management Plan and awareness-raising with upstream communities. (Indicator 0.1, 0.5, 0.3 and 0.4)</p> <p>Target 12: The Critically Endangered gharial is at clear risk of extinction, but this project has shown a slight growth in Nepal's largest population, which is a globally significant result. (Indicator 0.1, 0.3 and 0.4)</p> <p>Target 14: The contribution to water quality (Target 8), also contributes to ecosystem health; the project is designed to be of particular benefit to women, indigenous and poor local communities.</p> <p>Target 18: The number of people keen to take part in the Gharial Guard Groups demonstrates the relevance of the project to the knowledge and practice of these indigenous communities. We work with local institutions, such as the Buffer Zone User Committees (Indicator 0.2, 0.3 and 0.6).</p> <p>Target 19: The project support to the GCBC, post-graduate students, and local conservation awareness all support the knowledge base in Nepal for conservation. (Output 1)</p>
	CITES	We are working to conserve the gharial, which is listed on Annex 1 of CITES. However, the illegal wildlife trade does not pose a major threat to this population.

## 6. Project support to poverty alleviation

The project supports poverty alleviation for 8 indigenous fish-dependent communities; *Samudayama Aadharit Ghaaila Maachapalan Samuha (A and B)*, *Majhi Utthan Samuha*, *Santi Srijana Kirsak Samuhain*, *Shreee Gyan Jyoti Krisak samuha*, *Srijansheel Mahila Machhapalan Samuha*, *Bote Mahila Machhapalan Samuha*, *Darai Mahila Machhapalan Samuha* in the buffer zone of CNP. Specific support for poverty alleviation has been provided through activities conducted under output four (for details please see 3.1 and 3.2). The project has successfully set up 8 women-led community fishpond management committees and provided them with seed funding. These community fishpond groups have started harvesting the fish and have reported an 18% increase in income for fishing for 164 households, as compared to the baseline.

More generally the project is supporting the reduction of poverty through increased ecosystem services leading to, for example, food security and improved community health through water quality. These are not yet quantifiable.

## **7. Project support to gender equality issues**

The project has addressed the issue of poor women's representation in decision-making processes and limited access to resources which were evident through our preliminary socio-economic studies. Women were included in project planning meetings as well as heavily involved in the implementation of all project activities.

Women's leadership was prioritized in the formation of committees to manage the community fishponds with 76% of the members of these committees being women. One committee (named Srijansheel Women Fish Farming Group at Kathar) in the buffer zone of CNP is run by women only. The project has also focused on providing better access to income generating activities for women in particular. Additionally, to offset the existing gap in the capacity for conducting income generation activities in local communities' women were prioritised for inclusion in training programmes on aquaculture.

## **8. Monitoring and evaluation**

The Programme Coordination Committee and Project Management Unit are the key monitoring units established for monitoring and evaluation of project implementation, progress and results. Similarly, CNP in coordination with project partners is conducting regular monitoring of the project progress at the site. Regular visits as well as other organised for specific purposes have been conducted by the project manager to monitor and evaluate project implementation. Three monitoring visits have been made by senior ZSL staff joined by CNP senior staff, partners, representative of buffer zone users committee and local government. The Chair of PCC also conducted a monitoring visit to project sites observing the project's intervention in communities as well as in GCBC. He has provided his feedback and provided project management team with few suggestions to improve the implementation.

The project uses a performance appraisal framework (PAF), tied to the logframe, for ZSL staff to conduct M&E. The PAF uses ZSL's web-based systems to track progress and promote interaction between project partners. Monthly highlights reports are generated from the PAF with input from all the relevant project components. These feed into the regular project reports both for the Darwin Initiative and ZSL's internal M&E procedures.

The PAF is supplemented with rapid appraisals anonymously completed at the end of training sessions, forums, workshops and seminars, with data disaggregated by gender. In order to promote adaptiveness project reporting also feeds into an internal review process. Where amendments are deemed necessary these will be put forward to the Darwin initiative in a formalised approval process.

## **9. Lessons learnt**

Regular meetings among partners and project beneficiaries are vital for successful implementation of project activities.

Involvement and stewardship of existing and institutionalised community organizations such as Buffer Zone Management Committees and Buffer Zone User's Committees are vital for successful implementation of the project and to bring the positive change as planned in the biodiversity and community wellbeing.

River CBAPUs (Gharial Guard Groups) face some challenges in patrolling during the monsoon season, which reduces the motivation of community members during this period. We are exploring options to work with this seasonal pattern to ensure adequate year-round river protection.

New targeted institutions, working in coordination with the existing institutions mentioned above, have proven to be an effective means of establishing and embedding new livelihood activities, such as aquaculture under this project. Forming these under the umbrella of Buffer Zone User's Committees also support the sustainability of these new institutions by helping them to access existing support and resources for the long term.

Communities should be an integral component of any conservation programmes and providing them an alternative to direct use of natural resources will benefit conservation in long run as communities with alternative livelihood options works as guardians of the nature. As in this case, the project supported fishing communities are guarding the gharials and river ecosystem. They are the true Guardians of Gharials.

## 10. Actions taken in response to previous reviews (if applicable)

1. Please clarify who the person that is leading field activities

### **Response**

Bhogendra Rayamajhi, Senior Programme Officer at ZSL Nepal Office has been leading field activities with direct supervision and instruction of Project Lead, Hem Baral Country representative of ZSL in Nepal. Mr Bhogendra Rayamajhi is supported by a range of ZSL and partner staff in project implementation.

2. re. Activity 1.5, were one or two workshops conducted?

### **Response**

Two workshops were conducted under activity 1.5. During the first annual report, in section 3.1 output 1, it is mentioned that two workshops were conducted, however in Annex 1 one workshop was incorrectly mentioned under activity 1.5.

3. re. Outcome Indicators 1 & 3, please provide some more detail as to how the project is monitoring or plans to monitor these indicators.

### **Response**

Monitoring Indicator 0.1

During the year 1 Gharial Survey, Gharials are recorded in 12 out of 13 river monitoring sections. However, out of 1088 sampling replicates, gharials are recorded in only 118 replicates. The detailed habitat utilisation will be analysed using the annual survey data to show incremental change year-on-year.

Monitoring Indicator 0.3

Baseline set in year two on Fisherman catch per effort which is 445 grams per one effort for Rapti and 745 grams per one effort for Narayani river. This will be monitored throughout the project period. The data for this will be taken for the fisherman recording the weight of their catch and reporting to national park and project partners.

4. Delete repeated Outcome Indicator: Outcome indicator 4 is repeated as Outcome indicator 6.

### **Response**

Repeated outcome Indicator 6 has been deleted in the log frame.

5. re. Summary of progress (section 3), it would be better to provide more detail on progress/better summary of progress within the report, with reporting against the logframe presented in Annex 1.

### **Response**

Changes have been made to the report format as per the recommendation. Refer to section 3 in this report.

6. Section 5: Provide more detail as to how the CBD Aichi targets are supported by the project and indicate whether CITES is still supported and how.

### **Response**

Details on Section 5 provided as per the recommendation.

## 11. Other comments on progress not covered elsewhere

NA.

## 12. Sustainability and legacy

The key achievement towards sustainability of the project activities are:

- 1) Active involvement of DNPWC, Chitwan National Park Office, NTNC, Himalayan Nature, CBAPUs and local communities in gharial surveys.
- 2) Involvement of wider stakeholders throughout the project implementation such as local government, Fishery Development Centre etc.
- 3) Chitwan National Parks owns the river and gharial monitoring guidelines. Egg collection protocol and in are in process to own the River Ecosystem Management Plan as part of their overall management plan.
- 4) The 8 women-led community fishpond management committees have been formed within the existing institutional framework of BZMC. Therefore, BZMC fully owns the operation and management of these committees. Guideline documents for their management and operation are in place.

Collectively the close involvement of the responsible local agencies and the phased hand-over of all project achievements to them remains a sound exit strategy to ensure a sustained legacy.

## 13. Darwin identity

- The Darwin Initiative has been mentioned in each agreement signed with the partners. The DI logo and a description of the project has been published in ZSL's Quarterly Newsletter. The DI logo along with the partner logo will be placed on the rubber boats which will be handed over to CNP and NTNC for gharial monitoring and river patrolling. DI's contribution will be mentioned in all the drop-in centres as well as in GCBC. DNPWC, partner organizations, other conservation organizations working at national and site level, office of BZMC, and local communities know about the DI support through inception workshops, meeting and interaction programmes.
- The project webpage, hosted on the ZSL website, and the first in a series of blogs (details above) have highlighted the critical support provided to the project by the Darwin Initiative.

## 14. Project expenditure

**Table 1: Project expenditure during the reporting period (1 April 2018 – 31 March 2019)**

Project spend (indicative since last annual report)	2018/19 Grant (£)	2018/19 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Monitoring & Evaluation (M&E)				
Others (see below)				
<b>TOTAL</b>				

## Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2018-2019

Project summary	Measurable Indicators	Progress and Achievements April 2017 - March 2018	Actions required/planned for next period
<p><b>Impact</b></p> <p>Narayani and Rapti river ecosystems are protected and restored, with the recovered gharial populations safeguarded and viable long-term, and providing ecosystem services to local fishing communities practicing sustainable livelihoods, reducing poverty.</p>		<p>By the end of Year 2, project has set some milestones towards achieving the Impact. A 5 % increase in wild gharial population has been recorded by year 2. Likewise, the project intervention has resulted in 18 % increase in average income of 164 households ably practicing sustainable fish farming in community ponds.</p>	
<p><b>Outcome</b> <i>Health of the Narayani and Rapti river ecosystems improved, with increased fish stocks, and stabilised Gharial population, supported by local communities benefiting from sustainable livelihoods</i></p>	<ol style="list-style-type: none"> <li>1. Habitat utilisation by gharials increases by 10% by the end of Year 2 and 15% by the end of Year 4 (baseline that will be set in Year 1)</li> <li>2. By Year 4 100% of the fishermen in the Narayani and Rapti river system will have a valid Fishing licenses, will be recording and reporting the weight of each catch (Baseline to be set in Year 1)</li> <li>3. By Year 4 Fisherman's catches will show a 20% increase in weight per unit effort and with key high value fish species showing a population recovery (baseline to be set in Year 1)</li> <li>4. By the end of Year 4 there will be a 30% increase in the</li> </ol>	<ol style="list-style-type: none"> <li>1. Gharials are recorded in 12 out of 13 river monitoring sections. However, out of 1088 sampling replicates, gharials are recorded in only 118 replicates. The detail habitat utilisation will be analysed using the annual survey data and will be shared by third year reporting period.</li> <li>2. 50 % of fisher have valid fishing license and 60% of fisher man records and reports the weight of each catch.</li> <li>3. Baseline set in year two on Fisherman catch per effort which is 445 grams for Rapti and 745 grams for Narayani river.</li> <li>4. The annual gharials survey in year 2 showed 5 % increase in gharial population in wild in Chitwan National Park compared to base line set in year 1.</li> </ol>	<p>Key activities planned for next year</p> <ul style="list-style-type: none"> <li>• Revise gharial and river monitoring guidelines as necessary according to the survey findings</li> <li>• Organise meeting with conservation stakeholders to support DNPWC in the development of river ecosystem management plan.</li> <li>• Prepare husbandry and release guidelines for gharials of Nepal</li> <li>• Conduct training for GCBC staff on gharial handling and release.</li> <li>• Establish drop-in centres in upstream communities</li> <li>• Hold community workshop on sustainable fishing and gharial conservation</li> </ul>

	<p>Gharial populations in the wild within Chitwan National Park (Baseline to be set in Year 1)</p> <p>5. By the end of Year 4 adaptive management plans and participatory approaches have been adopted and are being implemented in the management of the wild and released Gharial population in Chitwan NP</p> <p>6. By Year 4 120 fish-dependent Household are sustainably managing fish-ponds, and receiving a regular income from farmed fish</p>	<p>5. By the end of this reporting period (Year 2), river ecosystem management plan has been prepared, Gharial and river monitoring guidelines has been revised and egg collection protocol prepared.</p> <p>6. 164 households from fish depended communities supported with seed money. They are managing the fishponds and already have started receiving money. 18% higher income from fish farms has been reported by year 2 compared to the baseline data. However, precise details of the income from the fish farms will be provided by next annual reporting period as these communities have not finalised their account calculating their profit and amount of income shared among the members. A total of 162 members received knowledge on sustainable fishing and gharial conservation.</p>	
<p><b>Output 1.</b> Improved river ecosystem management delivered through improved management plans and environmental policy based on a robust Gharial and</p>	<p>1. Ecological baselines established for prey fish stocks/biodiversity, and gharial distribution in year 1, and repeating every year following that.</p>	<p>1. Ecological Baselines established for prey fish stock and biodiversity. (XX reported shared as supplementary document). Gharials are recorded in 12 out of 13 river monitoring sections in year 1. However, out of 1088 sampling replicates, gharials are recorded in only 118 replicates. Gharial distribution map is yet to be prepared which will be prepared and shared by next reporting period.</p>	



<p>riverine ecosystem monitoring programme</p>	<ol style="list-style-type: none"> <li>2. Gharial and river ecosystem monitoring guidelines finalised, on the basis of successful monitoring in year 1, by end of year 2</li> <li>3. PhD student project underway and 2 Masters students projects completed on Gharials and the river ecosystem by year 3 to feed into management plans</li> <li>4. EDGE Fellow recruited with project focussed on gharial conservation to feed into management plans</li> <li>5. Threats and impacts to Gharial population and fish biodiversity mapped across Narayani and Rapti ecosystems, including illegal fishing by year 2</li> <li>6. Management plan for CNP updated, including strengthened policies on sustainable use of riverine biodiversity and reducing industrial and domestic waste by year 4</li> </ol>	<ol style="list-style-type: none"> <li>2. Gharial and river ecosystem monitoring guidelines has been finalised. Supplementary Document 1.</li> <li>3. Out of 4 Masters student projects, project supported three master's level students in year 2. Additional, 1 phd student is undertaking her project.</li> <li>4. 1 EDGE fellow recruited to work on gharial conservation in Chitwan and additional one recruited to work in Babai and Karnali.</li> <li>5. Survey to map the threats and Impacts to gharials population and fish biodiversity has been completed. Data is being analysed and map Threat map to be produced and shared by year 3.</li> <li>6. River ecosystem management plan draft for Chitwan National Park. Project has been regularly coordinating with Chitwan National Park to ensure the CNP Management plan updated and policies strengthened on sustainable use of riverine biodiversity and reducing industrial and domestic waster by year 4.</li> </ol>
<p>Activity 1.1 Collect and collate relevant literature available for Gharial and riverine ecosystem research and conservation</p>	<p>Completed in Year 1.</p>	
<p>Activity 1.2 Recruit 1 PhD candidate, 2 MSc student and one EDGE Fellow</p>	<p>Recruited 1 PhD Student, 3 MSc Student and 2 EDGE Fellow.</p>	
<p>Activity 1.3 Conduct large scale Local Ecological Knowledge survey.</p>	<p>Completed in Year 1.</p>	
<p>Activity 1.4 Organise 2 inception meetings with conservation stakeholders (including DNPWC, NTNC, HN and BZCs) and experts</p>	<p>Completed in Year 1.</p>	

Activity 1.5 2 workshops with wider stakeholders, consultation meetings with experts and community members for developing guidelines		Completed in Year 1.
Activity 1.6 Produce gharial/river monitoring guidelines		Completed in Year 1.
Activity 1.7 Conduct field training courses to train participants for the use of monitoring guidelines for PA staff, CBAPUs, conservation stakeholders, and university students.		A total of 64 participants were trained on use of monitoring guidelines including staff of national park, conservation stakeholders and CBAPUs. Annex 4.1
Activity 1.8 Conduct baseline surveys for fish stock, amphibian stock, and water quality in major rivers of Chitwan National Park, these to repeat in year 4. Annual monitoring of Gharial's will start in year 2.		Annual Gharial monitoring survey repeated in year 2. The preliminary results from survey showed 230 gharials in Rapti and Narayani Rivers which is an increase of 5 % compared to baseline.
Activity 1.9 Revise gharial/river monitoring guidelines as necessary according to survey findings.		Gharial and river monitoring guidelines are revised according to the survey findings and are now finalised. Supplementary Document 1.
Activity 1.10 Share findings to park managers and stakeholders in a wider forum and agree on an annual monitoring plan		Planned in year 3.
Activity 1.11 Publish at least 2 peer reviewed papers		Two papers are currently being drafted. Articles will be submitted to peer reviewed journal in Q1 of year 3.
Activity 1.12 Organise preliminary meeting with conservation stakeholders (including DNPWC, NTNC, HN and BZCs) and experts to support DNPWC in development of river ecosystem management plan for Chitwan National Park		A meeting organised among conservation stakeholders attended by the representatives of DNPWC, NTNC, HN, BZs and Protection unit of CNP organised in Sauraha Chitwan to support DNPWC in development of river ecosystem management plan.
Activity 1.13 2 workshops with wider stakeholders, consultation meetings with experts and community members to input into ecosystem management plan		Two workshops were conducted to collect inputs for river ecosystem management plan. A total 186 people were involved during the entire consultation process representing relevant stakeholders which includes community members from river dependent communities, buffer zone users' committee/users groups and forest users groups), park authorities, experts from NTNC, representatives from HN. The works was held one in Sauraha and one in Amaltari. Annex 4.2.
Activity 1.14 Conduct training workshop for the park staff and buffer zone community for river ecosystem management		Planned in Q1 of Year 3.
<b>Output 2.</b> Threats to fish stocks and gharials are reduced through protection provided by	1. 6-person CBAPUs established in 10 local communities with a total of	1. A total of 66 members recruited under 11 CBAPUs. A total of 50 CBAPU members were trained in river patrolling. CBAPU conducted total of 132 river patrols during this reporting period.

<p>10 Community-Based Anti-Poaching Units (CBAPUs) patrolling sensitive riverine zones in the Narayani and Rapti watersheds to protect the area from unsustainable fishing, poaching and other damaging and unsustainable uses of the river.</p>	<p>60 members trained in river patrolling, with support and enabling roles targeted at women by year 1</p> <ol style="list-style-type: none"> <li>2. Each CBAPU conducting 2 patrols of the river system per month in year 2</li> <li>3. Protected area authorities actively collaborating with CBAPUs and utilising intelligence gathered by year 2 to inform patrol planning</li> <li>4. Each CBAPU conducting 3 patrols of the river systems per month in year 3 with 100% of identified sensitive riverine zones being protected</li> <li>5. Illegal fishing incidents down 50% from baseline in year 1 to year 4</li> <li>6. Zero gharial poaching incidents in year 4</li> </ol>	<ol style="list-style-type: none"> <li>2. Each CBAPU (11 units) conducted river patrolling twice a month for the final six months of year 2. Total Patrol number in year 2 = 132 river patrols.</li> <li>3. During this reporting period, CBAPUs reported 10 incidents of illegal fishing and 4 incidents of illegal river material extraction which resulted in the arrests of 27 persons for illegal fishing in a national park and 13 persons for illegally collecting river materials in a national park.</li> <li>4. Project achievement against indicator 2.4 presented in 2.2 above.</li> <li>5. NA</li> <li>6. No records of Gharials poaching this year.</li> </ol>
<p>Activity 2.1 Assessment of status in the key locations for Gharial conservation for the establishment of CBAPUs</p>	<p>Completed in Year 1.</p>	
<p>Activity 2.2. Identify 10 existing CBAPUs and establish additional CBAPUs if needed</p>	<p>Completed in Year 1. As a value addition, the project supported to recruit additional three members in each of the 11 CBAPUs. Annex 4.3</p>	
<p>Activity 2.3 Train and equip CBAPUs in river patrolling</p>	<p>Completed in Year 1. As a value addition, a refresher training was conducted for the new and existing members of CBAPUs for monitoring river ecosystem and gharials. A total of 59 members of CBAPUs attended the training. Annex .4.4</p>	
<p>Activity 2.4 Support the CBAPU for yearly monitoring programmes, linked with park authority to control illegal activities in the rivers</p>	<p>Project supported the CBAPU for yearly monitoring of illegal activities across the rivers which resulted in 132 community patrols in this reporting period.</p>	

<p><b>Output 3.</b> Increased post-release survival of Gharial's from the Chitwan Gharial Conservation Breeding Centre (GCBC) delivered through implementing improved husbandry and release protocols, and post-release monitoring.</p>	<ol style="list-style-type: none"> <li>1. GCBC infrastructure improved and identified required equipment supplied by year 1</li> <li>2. Gharial husbandry and release guidelines developed and implemented at GCBC by year 3</li> <li>3. All 12 GCBC staff trained in herpetology husbandry and release by year 2</li> <li>4. 40 gharials tagged on release in year 2 as a pilot, and monitored from then on</li> <li>5. Released gharial annual mortality reduced 20% by year 4 from year 1 baseline</li> </ol>	<p>Project has been supporting improvement in the GCBC infrastructure through the management of Gharial Information Centre. A total of 12 GCBC staffs and two staff from conservation stakeholders trained in gharial husbandry in year 2. A total of 100 gharials of year 4-5 years released from GCBC to Rapti River. All the Gharials are tagged while 20 out of 100 were tagged with GPS satellite collar and are being continuously monitored. Gharial Husbandry and release Guidelines is being prepared. However, this has been delayed and will be completed by third annual reporting period.</p>
<p>Activity 3.1. Conduct assessment of the GCBC infrastructure and prioritise for improvement</p>		<p>Completed in Year 1.</p>
<p>Activity 3.2. Renovate GCBC infrastructure aiming to increase the egg laying, visitor experience, etc.</p>		<p>Project supported the management of the information centre inside GCBC. Various education and awareness raising materials including information boards, posters etc were produced. Also, the project has been supporting to increase the egg laying inside the GCBC through management of additional artificial sand banks inside the GCBC. The project supports a chip reader and a laptop to GCBC during this reporting period.</p>
<p>Activity 3.3. Review GCBC's current egg collection practice from the wild and revise guidelines as appropriate</p>		<p>Experts from London in collaboration with project staff and national park staff reviewed the current egg collection practice of GCBC and have revised a guideline based on the review results. Supplementary Document 4.</p>
<p>Activity 3.4. Prepare husbandry and release guidelines for gharials of Nepal</p>		<p>Gharial Husbandry and Release Guidelines is under preparation. This has been slightly delayed as planned in proposal. The guideline will be prepared by year 3.</p>
<p>Activity 3.5. Conduct training for GCBC staff on gharial handling and release</p>		<p>Training Planned in year 2 has been conducted. 18 number of staffs from GCBC were trained in gharial handling and release techniques. (Annex 4.5).</p>
<p>Activity 3.6. Post-release monitoring of gharials with state-of-the-art methods e.g. satellite tagging, data loggers, etc. Include research on some existing wild populations for comparison</p>		<p>100 Gharials are tagged and released in year 2 of which 20 are GPS tagged. The monitoring of these released gharials has already started and will be continued as planned in the proposal. (Annex 4.6).</p>
<p>Activity 3.7. Make recommendations to park managers and stakeholders in a wider forum based on findings</p>		<p>Planned in Year 4.</p>

<p><b>Output 4.</b> Food security of local communities improved through implementing sustainable fishing, and reducing the dependence of local communities on fishing through generating sustainable aquaculture livelihoods.</p>	<ol style="list-style-type: none"> <li>1. <i>8 fish ponds, run by indigenous fish-dependent communities established of sufficient size to support at least 20 households each in the buffer zones of CNP, with a focus on management by women's groups by the end of year 1.</i></li> <li>2. <i>60 households with a member trained in aquaculture are receiving 20% higher aquaculture income than baseline fishing income recorded in year 1, by year 2</i></li> <li>3. <i>20 people per day visiting each of 5 community conservation engagement centres in upstream communities by year 2</i></li> <li>4. <i>120 households with a member trained in aquaculture livelihoods are receiving 20% higher aquaculture income than baseline fishing income recorded in year 1, by year 3</i></li> <li>5. <i>90% (180 households) of practicing fishermen with valid licenses are using sustainable fishing methods by year 4</i></li> </ol>	<ol style="list-style-type: none"> <li>1. By the end of year 2, project supported 8 community fishponds run by indigenous fish dependent communities. Total number of Households involved in all these community managed fishpond is 164.</li> <li>2. 18% increase in average household income, for 162 households with a member trained in aquaculture, compared to baseline fishing income.</li> <li>3. 5 drops in centres established in upstream communities. 25 people visiting on average per day in these community conservation engagement centres.</li> <li>4. Project Achievement against indicator 4.4 reported in 4.2 above.</li> <li>5. The project has been working towards meeting this target.</li> </ol>
<p>Activity 4.1. Meetings with park managers and buffer zone committees to identify indigenous fish dependent communities and households</p>	<p>Completed in Year 1.</p>	
<p>Activity 4.2. Conduct socioeconomic and livelihoods survey in fish-dependent communities in years 1 and 4</p>	<p>Completed in Year 1.</p>	
<p>Activity 4.3. Prioritise households based on the wealth ranking from the socioeconomic survey</p>	<p>Completed in Year 1.</p>	

<p>Activity 4.4. Identify areas suitable for the establishment of community managed ponds</p>	<p>Three additional areas suitable for the establishment of community managed ponds were identified through wider consultation with stakeholders including national park.</p>
<p>Activity 4.5. Set up 5 women-led committees of 10 households to manage and operate community fish ponds</p>	<p>3 additional women led committees have been established which are managing a community fishpond. Two community managed fishponds were established in Budi Rapti buffer zone users committee and one in Khagendramalli buffer zone users committee. By the end of year 2, project has been supporting 8 Community managed fishpond. Project supported these community fishponds to access the markets for their fish products. Supplementary Document 5.</p>
<p>Activity 4.6. Organise 2 aquaculture training workshops for 150 households and 2 exposure visits for community leaders of identified communities</p>	<p>One training completed in year 1. Next training planned in year 3.</p>
<p>Activity 4.7. 5 community conservation engagement centres will be established in upstream communities for awareness raising of the project and the benefits of gharial and freshwater conservation.</p>	<p>5 Community Conservation engagement centres have been established in upstream communities. These community conservation engagement centres are established in Lamichaur Buffer Zone User Committee's Office, Jatayu Restaurant, Khagendramalli Buffer zone User Committee's Office, Bote Derai Tal Management Committee's Office and Jhuwani Community Library. These centres are now established as information centre for gharial and freshwater ecosystem conservation. All together 6000 brochures and 2000 posters on gharial conservation were prepared and are being disseminated and distributed through these centres. Likewise, 50 mounted posters on gharial conservation were prepared and are being disseminated in these centres as well in the schools, buffer zones officer in the upstream of Rapti and Narayani river. Supplementary Document 6 and Annex 4.8</p>
<p>Activity 4.8. Hold 10 community workshops on sustainable fishing and gharial conservation reaching 200 households</p>	<p>Two events of community workshop have been completed in this reporting period to share knowledge with local communities on sustainable fishing as well as on gharial conservation. Through these community workshop, altogether 162 households were reaching with the knowledge on sustainable fishing and gharial conservation. This will be continued as planned in proposal. Annex 4.7.</p>

## Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact: Naranyi and Rapti river ecosystems are protected and restored, with the recovered gharial populations safeguarded and viable long-term, and providing ecosystem services to local fishing communities practicing sustainable livelihoods, reducing poverty.</b></p>			
<p><b>Outcome:</b> Health of the Naranyi and Rapti river ecosystems restored, with improved water quality, increased fish stocks, and stabilised Gharial population, supported by local communities benefiting from sustainable livelihoods</p>	<p>1. By Year 4 the UNEP Water Quality Indicator for Biodiversity score in each river will show a steady increase, particularly in pollution hotspots (baseline that will be set in Year 1 )</p>	<p>1. Water quality test for conductivity, Nitrogen, Oxygen, pH, Phosphorous, Temperature results</p>	<p>Positive trend in these key indicators indicate an overall increase in the biodiversity value of these river ecosystems. This method has been used successfully in the Chambal river.</p>
	<p>2. By Year 4 100% of the fishermen in the Narayani and Rapti river system will have a valid Fishing licenses, will be recording and reporting the weight of each catch (Baseline to be set in Year 1)</p>	<p>2. Social survey results and Socioeconomic survey on livelihood composition, DNPWC records</p>	<ul style="list-style-type: none"> <li>• Positive results in all 3 ecological indicators (Gharial populations; fish populations; and water quality) indicate successful ecosystem restoration has taken place</li> </ul>
	<p>3. By Year 4 Fisherman's catches will show a 20% increase in weight per unit effort and with key high value fish species showing a population recovery (baseline to be set in Year 1)</p>	<p>3. Fisherman landing records</p>	<ul style="list-style-type: none"> <li>• Relevant authorities show continued commitment to implement robust management plans and monitoring programmes</li> </ul>
	<p>4. By the end of Year 4 there will be a 30% increase in the Gharial populations in the wild within Chitwan National Park (Baseline to be set in Year 1)</p>	<p>4. Gharial population monitoring records</p>	
	<p>5. By the end of Year 4 adaptive management plans and participatory approaches have been adopted and are being implemented in the management of the wild and released Gharial population in Chitwan NP</p>	<p>5. DNPWC records showing iterative updates to Gharial management plans, and management plans</p>	



	6. By the end of Year 4 there will be a 30% increase in the Gharial populations within Chitwan National Park (Baseline to be set in Year 1)	6. Gharial population monitoring records	
	7. By Year 4 120 fish-dependent Household are sustainably managing fish-ponds, and receiving a regular income from farmed fish	7. Fish pond records, socioeconomic survey results	
<b>Output 1:</b> Improved river ecosystem management delivered through improved management plans and environmental policy based on a robust Gharial and riverine ecosystem monitoring programme	1. Ecological baselines established for prey fish stocks/biodiversity, and gharial distribution in year 1, and repeating every year following that.	1. Partner reports, Scientific Papers, survey reports, senior DNPWC briefing	• Monitoring programme sustainably institutionalised by DNPWC in the long term
	2. Gharial and river ecosystem monitoring guidelines finalised, on the basis of successful monitoring in year 1, by end of year 2	2. Guideline documents	• DNPWC continues to have adequate resources to implement the required changes in all the relevant areas affecting the riverine ecosystem in the Narayani and Rapti watersheds
	3. PhD student project underway and 2 Masters students projects completed on Gharials and the river ecosystem by year 3 to feed into management plans	3. PhD and MSc researcher producing at least 2 briefings written to inform decision makers. 1 technical work shop host each year for PA and partners staff. Data from field research is incorporated in to M&E system.	• Improved plans and policy are effectively translated into improved management
	4. EDGE Fellow recruited with project focussed on gharial conservation to feed into management plans	4. Scientific Papers, survey reports, policy briefing	Management plan is effectively implemented by DNPWC
	5. Threats and impacts to Gharial population and fish biodiversity mapped across Narayani and Rapti ecosystems, including illegal fishing by year 2	5. Scientific Papers, survey reports, policy briefing	

	6. Management plan for CNP updated, including strengthened policies on sustainable use of riverine biodiversity and reducing industrial and domestic waste by year 4	6. Management plan, DNPWC strategic documents, CNP reports, workshop with senior DNPWC leaders	
<b>Output 2:</b> Threats to fish stocks and gharials are reduced through protection provided by 10 Community-Based Anti-Poaching Units (CBAPUs) patrolling sensitive riverine zones in the Narayani and Rapti watersheds to protect the area from unsustainable fishing, poaching and other damaging and unsustainable uses of the river.	1. 6-person CBAPUs established in 10 local communities with a total of 60 members trained in river patrolling, with support and enabling roles targeted at women by year 1	1. Training attendance records, results of post-training assessment	• CBAPUs continue to be respected and influential within the community
	2. Each CBAPU conducting 2 patrols of the river system per month in year 2	2. CBAPU reports, SMART reports showing prioritisation of sensitive riverine zones	• Sufficient number and diversity of community members are willing to participate in CBAPUs
	3. Protected area authorities actively collaborating with CBAPUs and utilising intelligence gathered by year 2 to inform patrol planning	3. Monthly coordination meetings are being held between PA authorities and CBAPU leads, and intelligence-led patrols by DNPWC using intelligence gathered from CBAPU patrols taking place	• Fishing of prey fish and the killing of gharials, both unintentionally via fishing and through poaching, are the key threats for the Gharial population.
	4. Each CBAPU conducting 3 patrols of the river systems per month in year 3 with 100% of identified sensitive riverine zones being protected	4. CBAPU reports, SMART reports showing that 100% of identified sensitive riverine zones have been patrolled	
	5. Illegal fishing incidents down 50% from baseline in year 1 to year 4	5. DNPWC Records, CBAPU reports, SMART reports	
	6. Zero gharial poaching incidents in year 4	6. DNPWC Records, CBAPU reports, SMART reports	
<b>Output 3:</b> Increased post-release survival of Gharial's from the Chitwan Gharial Conservation Breeding Centre (GCBC) delivered through implementing improved husbandry and release	1. GCBC infrastructure improved and identified required equipment supplied by year 1	1. Equipment records, installation records and GCBC reports	• Factors unrelated to the release procedures are not the primary cause of released gharial mortality
	2. Gharial husbandry and release guidelines developed and implemented at GCBC by year 3	2. Training attendance records, results of post-training assessment	Factors relating to post-release mortality are identified and adequately addressed through other project Outputs, specifically monitoring??
	3. All 12 GCBC staff trained in herpetology husbandry and release by year 2	3. Gharial tagging and monitoring reports	
	4. 40 gharial tagged on release in year 2 as a pilot, and monitored from then on	4. Guideline document approved by GCBC, GCBC records	

protocols, and post-release monitoring.	5. Released gharial annual mortality reduced 20% by year 4 from year 1 baseline	5. Release reports, reports from post release monitoring	
<b>Output 4:</b> Food security of local communities improved through implementing sustainable fishing, and reducing the dependence of local communities on fishing through generating sustainable aquaculture livelihoods.	1. 8 fish ponds, run by indigenous fish-dependent communities established of sufficient size to support at least 20 households each in the buffer zones of CNP, with a focus on management by women's groups by the end of year 1.	1. Fish pond management, environmental safeguarding guidelines on fishpond construction and management, and lease records	• Aquaculture combined with increased awareness and strengthened protected area management disincentives illegal, and harmful fishing practices
	2. 40% (60) of those households with a member trained in aquaculture are receiving aquaculture income higher than baseline fishing income recorded in year 1 by year 2	2. Partner reports, alternative livelihood records, social surveys	• Sustainable fishing increases the food security of local communities
	3. 20 people per day visiting each of 5 community conservation engagement centres in upstream communities by year 2	3. Partner reports of drop in centres	• Communities have the will to manage their resources sustainably long-term
	4. 80% (120) of those households with a member trained in aquaculture livelihoods receiving aquaculture income by year 3	4. Partner reports, alternative livelihood records, social surveys	• Unequal benefit sharing, corruption and theft do not fundamentally undermine community aquaculture
	5. 90% of practicing fishermen with valid licenses are using sustainable fishing methods by year 4	5. Fishing techniques survey at start of project and in year 4, and a reduction in the number of accidental deaths of gharials	
<b>Activities</b> (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)			
1.1	Collect and collate relevant literature available for Gharial and riverine ecosystem research and conservation		
1.2	Recruit 1 PhD candidate, 2 MSc student and one EDGE Fellow		
1.3	Organise 2 inception meetings with conservation stakeholders (including DNPWC, NTNC, HN and BZCs) and experts		
1.4	2 workshops with wider stakeholders, consultation meetings with experts and community members for developing guidelines		
1.5	Produce gharial/river monitoring guidelines		
1.6	Conduct field training courses to train participants for the use of monitoring guidelines for PA staff, CBAPUs, conservation stakeholders, and university students.		
1.7	Conduct baseline surveys for fish stock, amphibian stock, and water quality in major rivers of Chitwan National Park, these to repeat in year 4. Annual monitoring of Gharial's will start in year 2.		
1.8	Revise gharial/river monitoring guidelines as necessary according to survey findings.		
1.9	Share findings to park managers and stakeholders in a wider forum and agree on an annual monitoring plan		
1.1	Publish at least 2 peer reviewed papers		
1.11	Organise preliminary meeting with conservation stakeholders (including DNPWC, NTNC, HN and BZCs) and experts to support DNPWC in development of river ecosystem management plan for Chitwan National Park		
1.12	2 workshops with wider stakeholders, consultation meetings with experts and community members to input into ecosystem management plan		

1.13	Conduct training workshop for the park staff and buffer zone community for river ecosystem management
2.1	Assessment of status in the key locations for Gharial conservation for the establishment of CBAPUs
2.2	Identify 10 existing CBAPUs and establish additional CBAPUs if needed
2.3	Train and equip CBAPUs in river patrolling
2.4	Support the CBAPU for yearly monitoring programmes, linked with park authority to control illegal activities in the rivers
3.1	Conduct assessment of the GCBC infrastructure and prioritise for improvement
3.2	Renovate GCBC infrastructure aiming to increase the egg laying, visitor experience, etc.
3.3	Review GCBC's current egg collection practice from the wild and revise guidelines as appropriate
3.4	Prepare husbandry and release guidelines for gharials of Nepal
3.5	Conduct training for GCBC staff on gharial handling and release
3.6	Post-release monitoring of gharials with state of the art methods e.g. satellite tagging, data loggers, etc. Include research on some existing wild populations for comparison
3.7	Make recommendations to park managers and stakeholders in a wider forum based on findings
4.1	Meetings with park managers and buffer zone committees to identify indigenous fish dependent communities and households
4.2	Conduct socioeconomic and livelihoods survey in fish-dependent communities in years 1 and 4
4.3	Prioritise households based on the wealth ranking from the socioeconomic survey
4.4	Identify areas suitable for the establishment of community managed ponds
4.5	Set up 5 women-led committees of 10 households to manage and operate community fish ponds
4.6	Organise 2 aquaculture training workshops for 150 households and 2 exposure visits for community leaders of identified communities
4.7	5 community conservation engagement centres will be established in upstream communities for awareness raising of the project and the benefits of gharial and freshwater conservation.
4.8	Hold 10 community workshops on sustainable fishing and gharial conservation reaching 200 households

## Annex 3: Standard Measures

**Table 1 Project Standard Output Measures**

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Total planned during the project
6A	Training on Aquaculture	51 Female 24 Male	Nepalese	75	75	-	-	75	150
6A	Field training course for the use of gharial monitoring guidelines	9 Female 82 Male	Nepalese	27	64	25	25	25	141
6A	Training on river patrolling to CBAPU Members	2 Female 25 Male	Nepalese	27	33	-	-	-	60
6A	Refresher training for CBAPU	6 Female 53 males	Nepalese	-	59	-	-	59	60
6A	Gharial Husbandry Training	1 Female 17 Males	Nepalese	-	18	-	-	18	12
14A	Workshops	-	-	-	4	1	-	4	5
2	Number of people to attain Masters' qualifications		Nepalese	-	3	-	1	-	4
2	Number of people to attain Phd Qualification		British					1	1
2	Number of People to complete EDGE Fellowship						2		2
9	River Ecosystem Management Plan			-	1	-	-	-	1
10	River and Gharial Monitoring Guidelines			-	2	-	-	-	2
10	Gharial Husbandry and release Guidelines			-	1	1	-	-	1

11 B	Peer Reviewed papers			-		2	-	-	2
20	2 Rubber Boats (£10,300)			2	-	-	-	2	2
20	1 Display Screen (£550)			1	-	-	-	1	1
20	1 Computer (£850)			1	-	-	-	1	1
20	11 Camera (£1,350)			11	-	-	-	11	11
20	10 GPS (£950)			10	-	-	-	10	10
21	Community outreach drop-in centres			-	5	-	-	-	5

**Table 2 Publications**

<b>Title</b>	<b>Type</b> (e.g. journals, manuals, CDs)	<b>Detail</b> (authors, year)	<b>Gender of Lead Author</b>	<b>Nationality of Lead Author</b>	<b>Publishers</b> (name, city)	<b>Available from</b> (e.g. weblink or publisher if not available online)
Gharial monitoring begins in Chitwan Park	Online News	Chandan Kumar Mandal, 2018	Male	Nepalese	ekantipur	<a href="http://kathmandupost.ekantipur.com/news/2018-02-25/gharial-monitoring-begins-in-chitwan-park.html">http://kathmandupost.ekantipur.com/news/2018-02-25/gharial-monitoring-begins-in-chitwan-park.html</a>
Community-Crocodilian Coexistence	Blog	February 2018			ZSL	<a href="https://www.zsl.org/blogs/asia-conservation-programme/community-crocodilian-coexistence">https://www.zsl.org/blogs/asia-conservation-programme/community-crocodilian-coexistence</a>
Gharial Conservation and poaching control workshop organised (Published in Nepali Language)	Newsletter	July 2017			ZSL Nepal	ZSL Nepal Office
Gharial conservation information	Newsletter	October 2017			ZSL Nepal	ZSL Nepal Office

centre to be constructed (Published in Nepali Language)						
Gharial Conservation brochure	Brochure	December 2018			Himalayan Nature	Drop in Centres, ZSL Nepal Office, Himalayan Nature Office, NTNC office in Sauraha. GCBC
Gharial Conservation Poster	Poster	December 2018			Himalayan Nature	Drop in Centres, ZSL Nepal Office, Himalayan Nature Office, NTNC office in Sauraha. GCBC



## Annex 4 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

### Checklist for submission

	Check
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> putting the project number in the Subject line.	√
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> about the best way to deliver the report, putting the project number in the Subject line.	
<b>Have you included means of verification?</b> You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	√
<b>Do you have hard copies of material you want to submit with the report?</b> If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	
Have you involved your partners in preparation of the report and named the main contributors	√
Have you completed the Project Expenditure table fully?	√
Do not include claim forms or other communications with this report.	