



Darwin Initiative Annual Report

Important note:

To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be about 10 pages in length, excluding annexes



Submission Deadline: 30 April 2011

1. Darwin Project Information

Project Reference	18-006
Project Title	Integrated River Dolphin Conservation for Sustainable Ecosystem Services in the Brahmaputra
Host Country/ies	India/UK
UK contract holder institution	Zoological Society of London
Host country partner institutions	Aaranyak
Other partner institutions	Wildlife Institute of India, Department of Environment and Forest (Wildlife)
Darwin Grant Value	£292,000
Start/end dates of project	01 st July 2010 – 30 th June 2013
Reporting period (eg Apr 2010 – Mar 2011) and number (eg Annual Report 1, 2, 3)	01 st July 2010 to 31 st March 2011 Annual report 1
Project Leader name	Dr. Rajan Amin, Dr. Abdul Wakid
Project website	http://www.zsl.org/conservation/regions/asia/river-dolphin-india/
Report authors, main contributors and date	Dr. Rajan Amin, Dr. Abdul Wakid, Sally Rouse

2. Project Background

The Ganges River dolphin (*Platanista gangetica gangetica*; CITES & CMS Appendix 1, Schedule I species - Wildlife Act of India) occurs in the Ganges-Brahmaputra-Meghna and Karnaphuli river systems of India-Nepal and Bangladesh, with a surviving population of ≤ 2000 individuals. Following the extinction of the Yangtze River dolphin, the Ganges River dolphin, together with the endangered Indus River dolphin, are now the world's most threatened freshwater cetaceans. Few robust data are available on their regional status or on the significance of the different drivers of their ongoing decline which include overfishing (resource depletion, by-catch and direct exploitation), habitat alteration, water development projects, and pollution of industrial, agricultural and domestic origin, and even less is known about other threats such as disease. Since the threats to dolphins also have wider impacts on freshwater biodiversity and the human communities dependent upon freshwater resources, long-term dolphin conservation must also address factors including maintenance of fish stocks and water quality within a wider-scale integrated conservation framework.

The Brahmaputra River originates in Tibet and flows through India (Arunachal Pradesh and Assam) into Bangladesh, before reaching its delta with the Bay of Bengal (figure 1). Until recently, it was one of the last refuges containing relatively healthy populations of Ganges River Dolphins, but research by the Assamese NGO, Aaranyak, indicates that this population is now highly threatened and is experiencing a severe decline, with < 300 surviving individuals. There is therefore an urgent need to develop a long-term integrated conservation programme for the Brahmaputra dolphin, involving leading research, applied conservation action, capacity building and environmental education/awareness. The enhanced quantitative evidence-base and conservation skill set that will be established for understanding dolphin decline, and supporting population recovery and wider-scale ecosystem regeneration will then be transferrable across

the species' range. Successful river management will require effective planning, implementation and enforcement, which in turn will depend partly on the resources, priorities and political will of those in positions of authority, and partly on the understanding and support of local people.

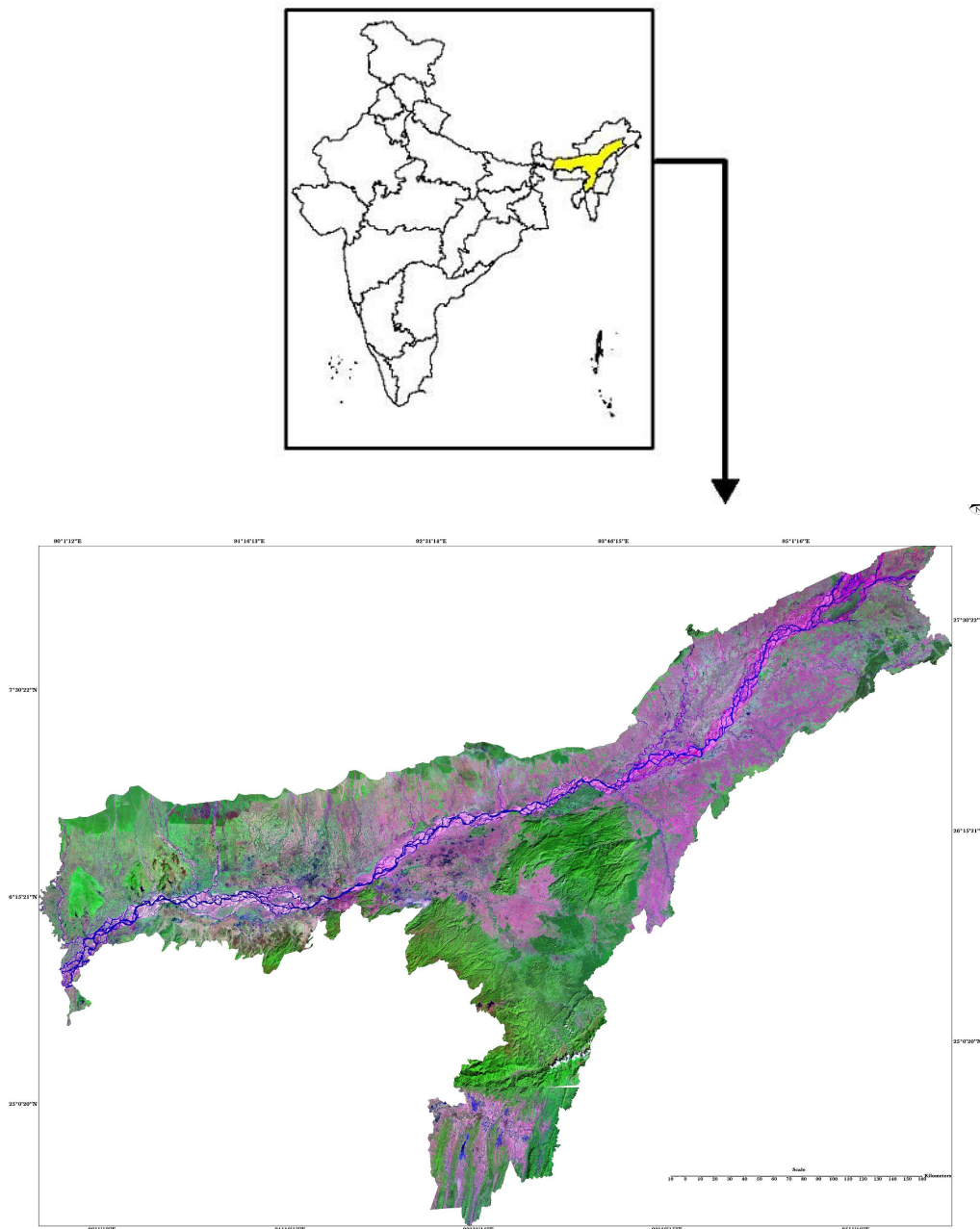


Figure 1: Project location. The Brahmaputra flows through Assam to the Bangladesh border.

The project was initiated by ZSL in response to an appeal by Aaranyak (an Assamese NGO), for support for dolphin conservation. It was setup with the following aims:

1. To implement quantitative methods for monitoring dolphin status, habitat preferences and population movements in a dynamic, challenging riverine environment, using visual/acoustic surveys, habitat/prey-base mapping, spatial analysis, and local interview techniques.
2. To investigate the significance of different threat factors responsible for dolphin mortality, using international post-mortem protocols, interview data, and initiating efforts to reduce/prevent the prioritized threats in association with concerned stakeholders.

3. To quantify effects of water-borne pollutants on dolphins, the Brahmaputra ecosystem and riverside communities through water quality monitoring.
4. To strengthen local stakeholder capacity to protect identified dolphin hotspot habitats. These initiatives will be complemented by collaborative investigation of associated trends in commercially and/or ecologically important fish species and other indices of wider-scale ecosystem health. The resulting scientific evidence-base will permit development and implementation of appropriate sustainable recovery plans for both the Brahmaputra dolphin population and regional freshwater ecosystem services through *in situ* community-based conservation areas and protected area river sections with associated protective management mechanisms.

3. Project Partnerships

LEAD HOST COUNTRY PARTNER: Aaranyak

Aaranyak are the primary environmental conservation NGO in northeast India and also a recognized Scientific and Industrial Research Organisation (SIRO). They have considerable experience in conservation of river dolphins in the Brahmaputra river system through their Gangetic Dolphin Research Conservation Programme. Aaranyak have taken the lead role in implementing and managing the project in Assam. They have taken responsibility for the hire of field staff, the construction of the survey boat, the production of education and publicity material and conducting the dolphin surveys. Aaranyak have worked closely with ZSL, collaborating on survey design, development of methods for the main river surveys and data analysis.

ZSL has also provided administrative support to Aaranyak and have assisted in the procurement of equipment. Three field visits were made by ZSL staff during the first year of the project (see Section 4.1).

The partnership has been managed through regular email, skype and telephone communication and the production of monthly progress reports.

OTHER PARTNERSHIPS: Wildlife Institute of India (WII)

The Wildlife Institute of India is the premier wildlife research organisation in India under the Ministry of Environment & Forest Govt. of India, with considerable experience in aquatic endangered species research and management, and influencing policy and legislation of wildlife conservation in India. The partnership operates under an MoU between ZSL and WII. WII have been involved with the project thus far in advisory capacity. Survey design and methodologies have been developed with input from Qamar Qureshi (a conservation biologist, based at WII). As the project develops, WII will be providing input at the policy level including influencing the Government to develop appropriate River Conservation Programme for the Brahmaputra River.

OTHER PARTNERSHIPS: Department of Environment and Forest (Assam)

The Wildlife Division of the Department of Environment and Forest, Govt. Of India, is the management authority of the Ganges River Dolphin in Assam. During Year 1, the Department granted necessary permission to undertake the project on the Brahmaputra. It is expected in year two and three they will provide management support and policy revision based on the dolphin survey results.

NEW COLLABORATIONS: Tom Akamatsu, National Research Institute of Fisheries Engineering (NRIFE), Japan

A new collaboration has been established with Dr. Tom Akamatsu, who heads the bioacoustics group at the National Research Institute of Fisheries Engineering, Japan. Dr. Akamatsu visited the project site during Nov-Dec 2010. During the visit he demonstrated the use of acoustic methods to survey river dolphins, trained two local scientists in the methods and data analysis. Following the visit, two hydrophones were donated to the project by the NRIFE. These will be used in conjunction with the visual survey methods to assess the river dolphin population. Dr. Akamatsu has continued to provide input to the project by advising with survey design and acoustic data analysis.

CBD FOCAL POINT

Outputs of the project in the first year have contributed to the Indian Government's obligations to the CBD including: **Improving capacity** of local NGOs and field biologists in the

conservation of threatened species through a training workshop held for members of the dolphin conservation network and the involvement of local MSc students in the project; **Protecting biodiversity** through standardised monitoring of key environmental and biological parameters of the riverine ecosystem, which feed into legislation and protective mechanisms; **Exchange of information** through collaboration and sharing of data entry forms and methods with the team working on river dolphins in Bangladesh and the Vikramshila Sanctuary, Bihar.

4. Project Progress

Progress against milestones for Year 1 (see logical framework contained in Appendix 1).

The project activity progress was hampered by the delay of the survey boat construction due to the (a) limited availability of skilled boat constructors in Assam, (b) unusual heavy rains during the boat construction time and (c) scarcity of boat construction materials. Further, the unusual rains and the Assam Election, 2011 also affected the field activities.

Note: The project formally started 1st July and therefore the activities from the original logical framework have been delayed

4.1 Progress in carrying out project activities

Numbers contained within brackets related to project activities detailed in the Logframework

ACTIVITY 1: COORDINATION FRAMEWORK AND INSTITUTIONALISED MONITORING AND REPORTING SYSTEMS AT THE BRAHMAPUTRA RIVER BASIN LEVEL IN ASSAM

During the reporting period (July 2010 to 31st March 2011) the following staff have been appointed to the project. **ToRs and contracts (1.1)** have been established for all staff members.

- Ms Sonali Sarma - Dolphin Conservation Network (DCN) Co-ordinator
- Mr Jayanta Patak and Miss Sonali Sarma - Education officers
- Mr. Sanjay Das and Mr. Dhruva Chetri were appointed as Research Assistants to the project. However, due to health problems Mr. Das had to take leave and is currently assisting with specific activities on a part-time basis only.
- Mr. Chandan Ri was initially appointed as a Research Scientist to the project. However, following initial discussions between the project leaders, and because the absence of Mr. Das it was felt that Mr. Ri would be more suited to the role of research assistant. The two research scientist posts have been advertised twice during the reporting period, but these are as yet to be filled. Recruitment of suitably qualified, local scientists has been problematic and the project is now considering broadening the search criteria and implementing training of less experienced/qualified staff up to the required level. To ensure that project activities continue, a number of MSc students have been involved in the project, one of whom there is potential to develop a PhD research project with.

- Two interns based at ZSL, Sally Rouse (3 days per week) and Emily Hodge (1 day per week), have been appointed on the project.

In January 2011, a satellite image of the river was purchased. The image was used by the GIS team based at Aaranyak to produce a GIS river layer of the survey area and finalise the survey track for the Brahmaputra and Subansiri tributary (Annex 3.1).

The river layer is associated with attributes such as the name of the river, length and area and will be further linked with the socio-economic data and the dolphin micro habitat data using Arc GIS geodatabase environment (Annex 3.2). A specification for a **GIS database system (1.3)** has been produced by Emily Hodge and ZSL staff; templates for the data have been developed. GIS database preparation is ongoing, which will be completed within next reporting period, including the production of the user manual. One Project staff (Chandan Ri) and three M. Sc. Students (Sunny Deori, Rajlakshmi Jha and Gunjan Gupta) are being trained in GIS use.

Development of the initial **survey design** was led by ZSL, in partnership Aaranyak, WII and Dr. Tom Akamatsu, following on from meetings during the joint field visit in November 2010. As part of the field visit, acoustic hydrophones were tested for use in dolphin surveys and discussions were held regarding the various methods for visual dolphin surveys (direct-count, independent observers, distance sampling). Dr. Akamatsu provided extensive training on hydrophone deployment, data collection and analysis to Chandan Ri and Dr. Abdul Wakid.

The group agreed on the following approach:

1. In the Brahmaputra main channel and Subansiri river: distance sampling will be used to estimate detection probabilities. A double platform mark-recapture method with independent observer teams will be used to estimate the proportion of dolphins that observers missed from perception bias (i.e. animals were on the surface but missed due to distraction or fatigue of observers, etc.). Observers will record the distance (visually estimated by trained observers since distance cannot be measured using laser range finder on water) and angle of dolphins from the survey boat. Additionally, an array of two hydrophones will be towed behind the survey boat to provide an independent estimate of the proportion of dolphins missed by the primary observers.
2. Boat speed will be kept low (around 10-12 kmh⁻¹) to minimise the availability bias of dolphins below the water surface. Where the river morphology permits, the boat will follow a zig-zag transect to cover as much favourable habitat as possible.
3. In the Kulsi: A double sampling approach will be used. Strip transects will be carried out as the river is too narrow for distance sampling using line transects. Direct counts of dolphins will be made by a single observation team, plus an additional observer stationed at the back of the boat to record sightings missed by the primary observer team (correcting for perception bias), since the river is too narrow for the double-platform boat (necessary for independent observer teams). For group sightings, best, low and high estimates will be recorded to evaluate sightings in terms of a range of abundance estimates to reflect the inherent uncertainty. A hydrophone array will be towed behind the boat to test the approach for correcting sighting bias. If proven, this method holds significant potential for obtaining absolute abundance estimate.
4. The same data will also be used to calculate encounter rates in each of the seven zones of the Brahmaputra main channel, to compare with dolphin estimates from 2005 and 2008.

Details of the design are given in Annex 3.3

Following finalisation of the survey method, **data entry forms** (Annex 3.4) were developed and test surveys were conducted in Kulsi tributary (January 2011). The survey team consisted of Abdul Wakid, Chandan Ri, Dhruba Chetry and Sunny Deori with two boatmen in a hired country (hand-driven) boat. Rather than purchasing a small river boat as initially proposed, it was found to be more cost effective to hire an additional river boat for use on the smaller tributaries. Analysis of test surveys data show that there is on average 32% (standard deviation = 17%) undercount of dolphins with visual methods.

A pilot survey was conducted in the main channel in the first week of March using the **the purpose-built boat (1.2)** (Annex 3.5). The **winter standardised dolphin and habitat survey (1.10)** across the Brahmaputra mainstream and its tributaries was delayed as a result of adverse weather upstream in the traditional boat construction site, in addition to the permission issues outlined above. Instead, the first full-scale survey will be the **early summer/pre-monsoon standardised dolphin and habitat survey (1.10)** which began in the 2nd week of April).

A list of water quality and habitat parameters was compiled from the literature and following consultation with relevant experts (Annex 3.6). This list was reviewed and finalised by the steering committee. Water quality **monitoring and sample equipment (1.2)** has been procured and training was attended by two ZSL staff on 8th March 2011. Following the training, a detailed instruction manual was produced for use in the field (Annex 3.7).

In addition to the main dolphin survey, **specific research studies for quantifying factors impacting on dolphins and the wider ecosystem (1.6)** have been developed for the following areas (Year 1 with additional studies in Year 2 and 3):

1. Assessing spatial patterns of habitat use and factors affecting dolphin distribution in the Kulsi River.

The objectives of the study are:

- a) To estimate the distribution and abundance of Ganges river dolphin in pre-monsoon season in the Kulsi River, Assam, India.
- b) To assess the factors, such as water quality, affecting the distribution and abundance of Ganges river dolphin in the Kulsi River.

This study will be completed in September 2011 with a dissertation report and a possible publication, and the following conservation implications:

- a) A standardized survey method for small tributaries (widths less than 300 m – in Assam Kulsi river, but also applicable more generally)
- b) Implications for conservation of habitat and disturbance covariates at both local and landscape level

2. Community attitude towards conserving the dolphins of Kulsi River

The objectives of the study are:

- a) Understand the local community interest towards conserving the dolphins of the Kulsi River
- b) To develop a conservation strategy involving local communities in protecting the Kulsi River Dolphins.

This study will be completed in September 2011 with a dissertation report and a possible publication

3. Impact of sand mining on the Gangetic dolphins of the Kulsi River

The objectives of the study are:

- a) To understand the impact of sand mining on dolphins of the Kulsi River
- b) To Develop a conservation strategy to minimize the impact of sand mining on Dolphins in the Kulsi River

This study will be completed in September 2011 with a dissertation report and a possible publication

4. Reducing risk of gillnet entanglement

Within the Ganges River system, small-mesh monofilament gill-nets cause the greatest damage to endangered Gangetic river dolphins (*Platanista gangetica gangetica*). In 2008, 12 dolphin mortalities resulting from net entanglement were recorded in the Brahmaputra. Methods to reduce these accidental killings are therefore crucial to the conservation of Gangetic river dolphins. The objectives of the study are:

- a) To test the effectiveness of acoustic alarms and passive acoustic reflectors in deterring Gangetic river dolphins from gillnets in the Brahmaputra river system.
- b) Use the results generated to reduce the rates of dolphin entanglement in gillnets.

5. Dam impact

Project number one has been implemented as an MSc project with a student from the Wildlife Institute of India. It was initially envisaged that a staff member would be enrolled on a PhD, focusing on one of these subject areas, but, due to the lack of suitable candidates, initial work has been completed at the MSc level. It is expected that a research project on the wider ecosystem, will be developed in Year 2, as part of a PhD programme for the MSc students. Research study number 4 will be implemented in Year 2, once the hydrophones and water quality analysis equipment are available for use following the premonsoon survey.

Number five is being developed as policy guiding document for a major potential threat to the Brahmaputra dolphins.

Development of activities relating to the assessment of the status of the wider Brahmaputra ecosystem began during the November field visit, with meetings held between the project partners and relevant experts.

- Dr. Hilloljyoti Singha (Assistant Professor, Assam University; minutes contain in [Annex 3.10](#)). A discussion was held on conducting bird surveys as part of the wider river ecosystem survey during the dolphin boat surveys. The boat bird survey would be simple consisting of a dedicated and experienced bird surveyor to monitor and record information from the boat. Ideally, the survey would be conducted during both the downstream and upstream part of the journey. It was agreed that this project would be best setup as a PhD research project perhaps collaborating with BNHS. The development of a PhD proposal is ongoing, but requires further review. It is hoped that a bird survey will be implemented in year 2.
- Dr. Firoz Ahmed (Senior Biologist, Aaranyak) and Abhijit Das (Researcher on Herpetofauna, Aaranyak). A discussion was held on assessing the habitat suitability for Gharial reintroduction as part of the dolphin boat surveys and conducting herpetofauna during the upstream journey of the boat ([Annex 3.11](#)). A survey methodology was submitted by Dr. Firoz Ahmed and Abhijit Das, and reviewed by the project leader. The finalised methodology is expected in next reporting period.

Based on previous questionnaires in the Brahmaputra Valley and along the Yangtze River, a draft list of questions has been compiled for the **fishermen/community surveys (1.8)** to cover fishing practices, rates of by-catch, social-economic information and local perception of dolphin conservation. The questions have been reviewed by ZSL staff and will be distributed to the steering committee following return from the pre-monsoon survey. The interviews are due to be piloted towards the end of May 2011 (Year 2) in 3-5 test sites. Following the pilot, a full-scale

survey will be implemented. Developing a sampling design and selecting sites for the survey is ongoing and will be finalised after input from the pilot. The questionnaires have been developed to be standardised across the region and will be implemented in the lower reaches of the Brahmaputra by a team focusing on Ganges River Dolphins in Bangladesh ([Annex 3.12](#)).

Development of protocols, training material and data recording forms, and training of core staff and DCN members in standardised land-based dolphin surveys (**1.4**), has progressed throughout year 1. A three day training camp was organised at Nimatighat (Jorhat) on 23rd – 26th March, 11 (**1.4**) to train DCN members in land-based monitoring. Altogether 3 programme staff and 30 DCN Members participated in this training camp, where participants were trained in the protocols to be maintained, data recording procedures and reporting. The participants were provided with training manuals and associated resource materials in the local language. The team is planning to conduct another extensive training to the DCN Members in the mortality monitoring, community engagement and awareness activities in year 2 in conjunction with the Annual Dolphin Day, where a complete package of manual and education tools will be provided to the participants. ([Annex 3.13](#))

A SWOT analysis of all the 30 DCN sites was completed at the beginning of the project ([Annex 3.14](#)). As Aaranyak was already conducting land-based dolphin monitoring through its community based Dolphin Conservation Network (DCN), the process continued to examine the effectiveness of the ongoing monitoring work (**1.5**). However, after analysing the collected data and efforts, several shortcomings were noticed, for which DCN training was organized on 23rd – 26th March, 2011, with modified protocols and data recording processes. The DCN members started to work at 30 sites from 1st April, 2011 with the modified method.

The majority of activities expected in year 1 for output 1 have been completed successfully. In the next reporting period, the focus will be on data analysis, implementing the community surveys and the next round of dolphin surveys.

ACTIVITY 2: ENHANCED CAPACITY OF LOCAL AUTHORITIES AND FISHING COMMUNITIES FOR DOLPHIN POPULATION RECOVERY AND FOR CONTRIBUTING TOWARDS WIDER SCALE ECOSYSTEM MANAGEMENT

Prior to the project, a network of 30 dolphin priority sites and 30 local volunteers had been established as the Dolphin Conservation Network (DCN). In September 2010, the sites and volunteers were assessed and reorganised, removing some of the weaker sites and replacing some of the volunteers with more suitable individuals, to give the final 30 DCN sites and volunteers. A SWOT analysis of the sites was conducted by Dhruba Chetri and the field team, to characterise the poaching risk, by-catch risk, fishing pressure, boat traffic, habitat, environmental issues, community type and alternative livelihood prospects at each site ([Annex 3.14](#)).

Land-based dolphin monitoring (1.4, 1.5, 2.9) data collected by the DCN prior to the project was analysed, but was found to have several weaknesses, namely no measure of effort,. This meant that estimation of dolphin encounter rates based on this data was not possible. The land-based survey methodology was reviewed and new data entry forms have been developed. **A training workshop for DCN members (2.9)** was held in Nimatighat (Jorhat) in March 2011. Training was delivered by Dr. Abdul Wakid, Sonali Sama (DCN co-ordinator), Jayanta Pathak (Education Officer) and Dhruba Chetry (previous DCN Co-ordinator). These trained DCN members started their systematic land-based dolphin monitoring from 1st April, 2011 and the first report is due in the 1st week of May.

ACTIVITY 3: LOCAL AND NATIONAL STAKEHOLDER SUPPORTED RECOVERY PLANS AND IMPROVED PROTECTIVE MECHANISMS FOR BRAHMAPUTRA RIVER DOLPHINS AND REGIONAL FRESHWATER ECOSYSTEM

These activities are not due to begin until year 3.

ACTIVITY 4: PROJECT MANAGEMENT, DISSEMINATION AND REPORTING

A **steering committee (4.1)**, with representatives from ZSL, Aaranyak and WII has been established. Again, permission issues have restricted the formalisation of the committee and prevented a project meeting (which was due to be held in Guwahati). Survey protocols and data analysis have been reviewed by members of the informal committee and staff assigned to

relevant aspects of the project. Now permission has been granted, a project meeting for all partners and relevant NGOs will be held during year two to formalise the steering committee

Three **site visits (4.2)** were made by ZSL staff during year 1. The first visit was in April 2010 (combined with the DI Nepal Rhino and Grassland end of project workshop and related activities), during which project planning, permission applications, staff recruitment and site visits were undertaken. Due to permission issues, it was decided to delay the official start of the project to July. The second visit took place from November – December 2010. The following activities took place: development of boat and land-based survey designs; initial data gathering and field assessments (DCN sites); equipment purchased; vehicle acquired; boat design and construction initiated; training content agreed; meetings with key partners including Assam Forest Department, NEDFi (medicinal and aromatic plants); aquaculture organisations. In addition, meetings were held with the Minister of Environment and Forest, Director General and senior staff in Delhi, where permissions issues were resolved pending submission of project details. A third visit is currently being undertaken (April-May) providing support on surveys and other on-going project activities.

Outside of these visits, the field team have sent **monthly progress reports (4.2)** (Annex 3.1) to inform ZSL of project activities.

Dissemination of the project has been through updates on the ZSL **website (4.4)**, including the addition of photos from the November field visit. Again, publicity was kept to a minimum prior to permission from the concerned governmental agencies.

4.2 Progress towards project outputs

PROGRESS TOWARDS OUTPUT 1

Significant progress has been made towards the development of a coordination framework and institutionalised monitoring and reporting systems at the Brahmaputra River basin level in Assam. Dolphin survey protocols have been established and implementation of the survey has begun. Analysis of the survey data early in year 2 will provide the quantitative baseline information on dolphin population dynamics and will serve as a measurable indicator of the institutionalised monitoring. The output assumption that research staff are well qualified has not held, and training of less qualified students to the required standard is ongoing.

Set backs have been encountered with regards to the handling of carcass and as such all related activities (post-mortems, dolphin rapid response team and training of fishermen in release procedures) have not been achieved. Permission is needed from the Ministry of Environment & Forest (MoEF), Govt of India and the Chief Wildlife Warden (CWW) of Govt of Assam handling carcasses, for which a new application will be submitted to the MoEF via CWW in year 2. However, getting the animal handling permission is a lengthy process in India and thus we are expecting to obtain the necessary permission in the middle of year-2, which would allow the team to further progress towards this output.

Many of the measurable indicators of output 1 are expected in year 2 and 3

PROGRESS TOWARDS OUTPUT 2

Thirty DCN members have been identified and enrolled as the key people for the community engagement activities. Required education tools are in the draft stage and will be finalised before training of DCN Members undertake these activities within next reporting period. A cost benefit analysis of the dolphin eco-tourism will be conducted in year-2, based, with follow ups conducted in year-3. Medicinal and aromatic plant (MAP) has been identified as one of the potential alternate livelihoods. A discussion with a local MAP expert, Dr. M. Ahmed, was held for a cost benefit analysis in year-2. Following the cost-benefit analysis, a MAP pilot project will be undertaken. Establishment of Dolphin Rapid Response Team (DRRT) and training to the 30 DoEF staff nearest to 30 DC in stranded dolphin releases and carcass collection was delayed due to the permission issue. Separate permission will be applied for for this activity, and it will be undertaken in the next reporting period. The fishermen engagement activities in dolphin oil bait fishing are being identified. The study on the use of dolphin oil and initiatives to stop use of dolphin oil, data gathered, size and trend in the trade will be conducted and completed in year 2. As an attempt to develop cross-ecosystem linkages with Ganges River Programme for skills and information, groups working for the conservation of the species in Ganges River System

has been identified and linkages established. Study tours in these groups will be conducted in year 2. Self-regulatory mechanisms for natural resource management in fishing communities will be enhanced in year-2 and will be completed in year 3. Establishment of dolphin ambassadors and their training will be completed in year 2.

PROGRESS TOWARD OUTPUT 3

The majority of work towards creating recovery plans and improved protection for the river dolphins will take place towards the end of year 2 and the beginning of year 3. The recovery plans and policy leveraging are dependent on the baseline data which is being collected and analysed during the first part of year 2.

4.3 Standard Measures

Table 1 Project Standard Output Measures

Code No. Established codes	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
2	Number of people to attain Masters qualification (MSc, MPhil etc)	1 (will be completed in Sept, 11)				1	0	
3	Number of people to attain other qualifications (ie. Not outputs 1 or 2 above)							
4A	Number of undergraduate students to receive training	3				3		
4B	Number of training weeks to be provided							
4C	Number of postgraduate students to receive training	1				1		
6A	Number of people to receive other forms of education/training (which does not fall into categories 1-5 above)	30				30	30	30
6B	Number of training weeks to be provided							
7	Number of (ie different types - not volume - of material produced) training materials to be produced for use by host country							
8	Number of weeks to be spent by UK project staff on project work in the host country							
9	Number of species/habitat management plans (or action plans) to be produced for	1 (dam impact – polic						

	Governments, public authorities, or other implementing agencies in the host country	y document)						
10	Number of individual field guides/manuals to be produced to assist work related to species identification, classification and recording	1						
11B	Number of papers to be submitted to peer reviewed journals			4	4	4	0	4
12A	Number of computer based databases to be established and handed over to host country	1 (GIS data base)						
14A	Number of conferences/seminars/workshops to be organised to present/disseminate findings							
14B	Number of conferences/seminars/workshops attended at which findings from Darwin project work will be presented/disseminated.							
15A	Number of national press releases in host country(ies)							
15B	Number of local press releases in host country(ies)							
15C	Number of national press releases in UK							
15D	Number of local press releases in UK							
16A	Number of newsletters to be produced							
16B	Estimated circulation of each newsletter in the host country(ies)							
16C	Estimated circulation of each newsletter in the UK							
17A	Number of dissemination networks to be established							
17B	Number of dissemination networks to be enhanced/ extended							
18A	Number of national TV programmes/features in host country(ies)							
18B	Number of national TV programmes/features in UK							

18C	Number of local TV programmes/features in host country(ies)							
18D	Number of local TV programmes/features in UK							
19A	Number of national radio interviews/features in host county(ies)							
19B	Number of national radio interviews/features in UK							
19C	Number of local radio interviews/features in host country(ies)							
19D	Number of local radio interviews/features in UK							
20	Estimated value (£'s) of physical assets to be handed over to host country(ies)							
21	Number of permanent educational/training/research facilities or organisations to be established and then continued after Darwin funding has ceased							
22	Number of permanent field plots to be established during the project and continued after Darwin funding has ceased							
23	Value of resources raised from other sources (ie in addition to Darwin funding) for project work							

Table 2 Publications

Type (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Book	Hihur sandhanat luitedi (2010): Wakid, A.	Aaranyak, Guwahati	Aaranyak, Survey, beltola, Guwahati – 781028, Assam, India. www.aaranyak.org	1,500
Report	Impact of dams on the dolphins of Assam.....: (2010): Wakid, A., Talukdar, B., Das, P.	Aaranyak, Guwahati	Aaranyak, Survey, beltola, Guwahati – 781028, Assam, India. www.aaranyak.org	500
Manual (ongoing)	Land based dolphin and habitat	Aaranyak, Guwahati	Will be completed by September, 2011.	

	monitoring (2011): Wakid, A., Rouse, S., Sharma, S.....			
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4.4 Progress towards the project purpose and outcomes

Progress has been slow, but this has not been due to lack of trying and the project team has worked very hard. Significant hurdles had to be overcome following changes in rules for foreign projects and also lack of suitable research candidates. A heavy monsoon has also delayed the survey and associated activities. However all systems are now in place with extensive equipment procured and the purpose-built boat completed. The survey methods have been improved and trialled with standardisation and training. This will greatly help in the important second and third years. Important progress has also been made in identifying viable alternative livelihoods and partnerships are being developed with key institutions. Project staff are dedicated and hard working and technical support is being provided to enhance their skill set. A regional training course on tools for monitoring freshwater ecosystem biodiversity and health is being considered to help develop the necessary skill base over the longer term. Surveys on other aquatic taxa are being encouraged within research and conservation groups at Aaranyak as part of the dolphin surveys to maximise investment and integration of the freshwater conservation elements. A theatre project with input from Earthbeat (from the Nepal DI project) is being developed. The indicators remain adequate for measuring outcomes of the project, local management structures are being refined to coordinate and handle various projects elements with greater focus.

4.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The impact of the project towards achieving the final goals of the project is difficult to measure at the current stage. Systems for collecting baseline data on dolphin (and other taxa including birds and herpetofauna), environment and ecosystem services are now in place and significant effort will be made in the coming year. Progress towards sustainable fishing practices and alternative livelihoods is also being made through careful evaluation and building longer term partnerships with the fisheries dept and relevant institutions in a challenging environment both politically and on the ground. Discussions have also taken place with senior authorities, with a view to develop an action plan for the dolphin and its Brahmaputra ecosystem. The plans will be led by the State Government. Furthermore, discussions with Orang park authorities have led to the initiation of process of inclusion of the adjoining Brahmaputra river section.

5. Monitoring, evaluation and lessons

Our strategy for Monitoring and Evaluation has been to have an established steering committee to review project progress according to the logframe, involving all the partners. The permission issue has resulted in delay in this and through extensive meetings has now been resolved and steering committee is being setup. The UK PL has conducted three visits to Assam for table reviews of progress followed by site visits. An additional UK person has been recruited to support activities given the scale of the work and limited capacity locally. Ongoing evaluation is being undertaken through examination and discussion of monthly reports with colleagues in country or in UK and regular communication on issues and problems. On specific topics we are engaging with regional colleagues, particularly WII, and also continuing a strong partnership with an acoustic expert in Japan. Given the delays with several activities and an all important second year of the project to come, the project programme has been divided into the four main areas (research and monitoring, livelihoods, environment awareness and education, policy) and Aaranyak staff with relevant background / programmes have been selected to manage these areas following an extensive project progress review. Further training will enhance the overall capacity of this key NGO in north east India. Partnerships with State Zoo and State Veterinary Dept are being proposed to resolve the issue of animal handling.

If this project has its desired effect, there will be clear indications of its impact in stabilising dolphin populations, reduced mortality (by-catch or direct exploitation) measured (actual numbers) through presence in 30 priority sites and community support and advocacy in overall changes in or introduction of new policies and uptake of recommendations (fisheries, industries, dams, sustainable livelihoods, community stewardship), and robust scientific methods (boat based surveys, environment monitoring, post-mortems, fishermen surveys, ecosystem services), capacity in these scientific methods and research, dolphin rapid recovery (accidental entanglement), advocacy, novel approaches in community engagement (drama etc); strategies formulated following pilot projects on alternative to dolphin fish oil and fish based sustainable livelihoods (aquaculture, ornamental fishing), tourism, medicinal and aromatic farming or handicraft based aquatic weed (principal weed the water hyacinth which will also help in its control), improved engagement between the community, authorities and other stakeholders (strengthened public support, network working, increased income in poor fishing communities with sustainable resource use, cross linkages with regional dolphin programmes and monitoring) and with strong political support (steering committee and technical committee and site DCN functioning). All these aspects will be measured quantitatively where possible and through an end-of-project review, workshops and consultations.

There are lessons from the year's work in the need for greater integration between all stakeholders and now that the permission issue has been sorted out greater progress in the implementation of project activities will be made in subsequent years with greater coverage.

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

N/A

7. Other comments on progress not covered elsewhere

N/A

8. Sustainability

The project has begun the process of building capacity and technical skills for the key conservation NGO (Aaranyak) in the region. Extensive equipment has been procured or constructed including a purpose-built monitoring and survey boat capable of operating in a complex river system and equipped with the necessary tools for environment monitoring including water quality sensors, testing kits and a navigation system. Extensive monitoring equipment including acoustic, sensors, binoculars, range finders and a high resolution camera have been procured and key staff trained in their use. With careful use and maintenance all of this equipment will last well beyond the lifetime of the project. The project is also enhancing existing methods and finalising standardised monitoring and survey protocols along with a scientific GIS geo-database, which together will enable the primary partners to continue monitoring the status of dolphins and their ecosystem beyond the lifetime of the project.

Realistic sustainable livelihood options are being explored. A partnership is being developed with NEDFi (North Eastern Development Finance Corporation Limited) to initiate development of water hyacinth based handicraft in the poor fishermen communities. Water hyacinth is the principal invasive alien plant species (IAPS) in the water systems in Assam and impacting biodiversity, increasing sediment levels and mosquito breeding sites. The fishermen have very good weaving skills, material is plentiful and there is a guaranteed market through NEDFi (for good quality products) and can also be sold locally. Micro-credit is also where required. Ground work also has been done on the piloting of native species aquaculture through a local expert and the fisheries dept. A plan is being put in place for participatory enforcement activities. Dolphin priority sites have been selected. Support from the State Chief Secretary and involvement from the District Administrations will provide the framework for implementation and should help to reduce local community impacts on ecosystem services in prime dolphin habitat in the long term, especially as the focus of these livelihoods is their economic, social and environmental sustainability.

Sustainability for the environment education was initially being considered through CEE but Aaranyak has now established an education unit so a decision has been made to strengthen this

for the longer term. Links with both CEE and the fisheries department will continue to compliment activities and ensure integration.

The DCN with 30 sites has finally been established and will provide a longer term presence in the fisher communities.

A significant weakness encountered is limited technical local capacity (the project has been unable to recruit the required quality research scientists). The project is considering a 3-4 week course on tools for monitoring freshwater ecosystem health and its management. The target audience will be MSc students, scientists and managers. The project will institutionalize the course at a suitable local university and with the fisheries dept for long term sustainability. Necessary equipment including a boat to accommodate 20 people are already in place

9. Dissemination

Besides the reports and media outputs, the main product under development is a play which will be used in many different contexts of performance. The theme is around the dramatic changes taking place in the ecosystem (so vital to thousands of communities), its services and its animals (including the dolphin and also floodplain animals such as rhinos and tigers) as a result of a number of factors and the need to mobilise public opinion, achieve wide community and political support for necessary measures and action. The target audiences will be both fisher communities and also policy makers. If successful, the capacity will then exist within Assam to further develop these approaches and refine them with both State and perhaps donor support. A documentary on the cultural, ecosystem services, dolphin and other biodiversity of this unique ecosystem using the Gangetic dolphin as a future scenario is also being planned to be screened during the boat-based awareness campaigns. The products are envisaged as material in the future for both radio and television to reach as wide an audience as possible. A poster-based education pack is also being developed to raise awareness in the communities. This approach was (and continues to be) highly successful in the DI rhino and grassland project in Nepal. Progress and outcomes will also be disseminated within the conservation community through awareness materials, meetings, seminars and symposia towards the end of the project cycle to ensure lessons learned are passed on as rapidly as possible to encourage other initiatives.

All relevant materials relating to the project will be placed on a webpage of the Aaranyak in Assam and summaries on the ZSL website. Much more will be done with the permission issue resolved.

10. Project Expenditure

Table 3 project expenditure during the reporting period (1 April 2010 – 31 March 2011)

Item	Budget (please indicate which document you refer to if other than your project application or annual grant offer letter)	Expenditure	Variance/ Comments
Staff costs specified by individual			
Overhead costs			
Travel and subsistence			
Operating costs			
Capital items/equipment (specify)			
Others: Consultancy			
Others (please specify)			
TOTAL			

11. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for LTS and the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2010-2011

Project summary	Measurable Indicators	Progress and Achievements April 2010 - March 2011	Actions required/planned for next period
<p>Goal: <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <ul style="list-style-type: none"> ⇒ The conservation of biological diversity, ⇒ The sustainable use of its components, and ⇒ The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 		<p>The impact of the project towards achieving the final goals of the project is difficult to measure at the current stage. Systems for collecting baseline data on dolphin (and other taxa including birds and herpetofauna), environment and ecosystem services are now in place and significant effort will be made in the coming year. Progress towards sustainable fishing practices and alternative livelihoods is also being made through careful evaluation and building longer term partnerships with the fisheries dept and relevant institutions in a challenging environment both politically and on the ground. Discussions have also taken place with senior authorities, with a view to develop an action plan for the dolphin and its Brahmaputra ecosystem. The plans will be led by the State Government. Furthermore, discussions with Orang park authorities have led to the initiation of process of inclusion of the adjoining Brahmaputra river section.</p>	
<p>Purpose To initiate a long-term integrated conservation programme for the Ganges River dolphin in the Brahmaputra River system and to support ecosystem services through research and monitoring, capacity building, environmental awareness and participatory conservation action</p>	<ol style="list-style-type: none"> 1. Improved information on dolphin population dynamics and threats for effective management and implementation of conservation strategy. 2. Adoption of ecosystem management recommendations by relevant agencies (forest, fisheries, water, energy, industries etc). 3. Decline in dolphin mortality through poaching and by-catch. 	<p>Progress has been slow, but this has not been due to lack of trying and the project team has worked very hard. Significant hurdles had to be overcome following changes in rules for foreign projects and also lack of suitable research candidates. A heavy monsoon has also delayed the survey and associated activities. However all systems are now in place with extensive equipment procured and the purpose-built boat completed. The survey methods have been improved and trialled with standardisation and training. This will greatly help in the important second and third years. Important progress has also been made in identifying viable alternative livelihoods and partnerships are being developed with key institutions. Project staff are dedicated and hard working and technical support is being provided to enhance their skill set. A regional training course on tools for monitoring freshwater ecosystem biodiversity and health is being considered to help develop the necessary skill base over the longer term.</p>	<ol style="list-style-type: none"> 1. <i>Analyse survey data from year 1 and calculate dolphin abundance estimates.</i> 2. <i>Implement alternative livelihood and community engagement activities</i> 3. <i>Early summer/pre-monsoon season standardised dolphin and habitat survey across the Brahmaputra mainstream and its tributaries completed (inc. acoustic and sample collection/analyses);</i>

		<p>Surveys on other aquatic taxa are being encouraged within research and conservation groups at Aaranyak as part of the dolphin surveys to maximise investment and integration of the freshwater conservation elements. A theatre project with input from Earthbeat (from the Nepal DI project) is being developed. The indicators remain adequate for measuring outcomes of the project, local management structures are being refined to coordinate and handle various projects elements with greater focus.</p>	<p><i>database populated, report and maps produced/updated and disseminated to all relevant stakeholders and steering committee.</i></p> <p>4. <i>Collection of fisheries and socio-economic data</i></p>
<p>Output 1. . Coordination framework and institutionalised monitoring and reporting systems at the Brahmaputra River basin level in Assam</p>	<p>1a. An improved, appropriately equipped and trained research and standardised monitoring unit established by Yr 1 (with at least five project staff and 30 community-based Dolphin Conservation Network/DCN members). 1b. Quantified baseline information on dolphin population dynamics, drivers of decline, habitat status and regional ecosystem services produced, disseminated and used for planning; at least four staff trained in resource ecology and animal health by Yr 2. 1c. Standardised post mortem procedures implemented; four trained veterinary dept staff (Yr 1). 1d. Standardised boat-based dolphin surveys (seasonal) along the Brahmaputra River system (Yr 1-3). 1e. Land-based dolphin monitoring surveys (weekly) in 30 priority sites across Brahmaputra Valley (Yr 1–3). 1f. Fishery data at landing and market sites collected and analysed; fishermen surveys conducted in the same 30 priority sites (Yr 1-2). 1g. Fishermen community socio-</p>	<p>Significant progress has been made towards the development of a coordination framework and institutionalised monitoring and reporting systems at the Brahmaputra River basin level in Assam. Dolphin survey protocols have been established and implementation of the survey has begun. Analysis of the survey data early in year 2 will provide the quantitative baseline information on dolphin population dynamics and will serve as a measurable indicator of the institutionalised monitoring. The output assumption that research staff are well qualified has not held, and training of less qualified students to the required standard is ongoing.</p> <p>Set backs have been encountered with regards to the handling of carcass and as such all related activities (post-mortems, dolphin rapid response team and training of fishermen in release procedures) have not been achieved. Permission is needed from the Ministry of Environment & Forest (MoEF), Govt of India and the Chief Wildlife Warden (CWW) of Govt of Assam handling carcasses, for which a new application will be submitted to the MoEF via CWW in year 2. However, getting the animal handling permission is a lengthy process in India and thus we are expecting to obtain the necessary permission in year-2, which would allow the team to further progress towards this output.</p> <p>Many of the measurable indicators of output 1 are expected in year 2 and 3</p>	

	<p>economic surveys in the same 30 identified sites (Yr 1-2). 1h. Annual Dolphin And Habitat Status Reports produced and disseminated to stakeholders; at least five core staff trained in statistical data analysis (Yr 1-3). 1i. Priority dolphin river segments identified by Yr 2. 1j. Ecosystem information synthesised for inclusion in regional plans and statutory processes around threatened / protected species and freshwater ecosystems by Yr 3. 1k. Research information disseminated by Yr 3.</p>	
<p>1.1 Recruitment of two Indian scientists with relevant experience in freshwater ecology; recruitment of 2 local research assistants; setup of ToRs and contracts. 1.2 Completion of purpose-built boat; additional river boat, procurement of monitoring and sample analysis equipment. 1.3 Development of GIS database system for Brahmaputra River dolphin and ecosystem with detailed design specification, training of staff in its use. 1.4 Development of protocols, training material and data recording forms and training of at least 5 programme core staff and 30 DCN members in standardised land-based dolphin surveys. 1.5 Land-based dolphin and habitat monitoring surveys (weekly) with monthly reporting in 30 priority sites across Brahmaputra Valley. 1.6 Specific research studies for quantifying factors impacting on dolphins and wider ecosystem; PhD enrolment of identified project staff. 1.7 Development of standardised dolphin post mortem procedures; training of at least 4</p>		<p>1.1 Two local research assistants recruited and ToRs and Contracts established. Research scientist will be trained from local MSc students 1.2 Boat complete, monitoring and sampling equipment procured. Calculated that it is more cost effective to hire an additional river boat than purchase one. 1.3 Satellite image purchased, and river layers developed. Development of the database specification is ongoing. One project staff and 3 MSc students have been trained in GIS use. Completion of database in next reporting period 1.4 See 2.9 1.5 See 2.9 1.6 Five specific research studies developed, and one MSc student enrolled. Difficulty finding a suitable PhD candidate. In year two, additional MSc students will be enrolled, and one project will be developed into a PhD 1.7 International post mortem procedure documents have been obtained, but due to the continuing problems with permission to handle dolphins or carcasses, further development of the post-mortem activities, including formation of the dolphin rapid response team (see below), have been delayed. Necessary permission has been obtained in March, 2011 from the office of the Chief Wildlife Warden, Assam excluding the permission to handle carcass. However, a fresh application for carcass handling will be applied in year-2 to the concerned government authorities. Following permissions, post mortem protocols will be developed in year-2. 1.8 A pilot questionnaire has been developed for fishing community and socio-economic surveys. A survey data sheet for landing and market sites has been prepared and is currently under review. Chandan Ri (research assistant) is undertaking this study and DCN members will be trained in</p>

<p>veterinary college dept staff in post-mortem, necropsy and pathology.</p> <p>1.8 Development of detailed survey design, data recording forms and procedures for fishermen surveys, fishing community socio-economic surveys and fishery data collection at landing and market sites; training of DCN members and programme staff in interview techniques, undertaking of surveys.</p> <p>1.9 Development of protocols, training material and data recording forms, training workshop in standardised boat-based dolphin surveys (at least 5 programme core staff and 30 DCN members).</p> <p>1.10 Seasonal standardised dolphin and habitat surveys (2 early summer/pre-monsoon, 2 monsoon-mainly in the tributaries, 3 winter surveys) across the Brahmaputra mainstream and its tributaries (inc. acoustic and sample collection/analyses); populating of database, production and circulation of report and maps to relevant stakeholder and steering committee (for monitoring status and documenting seasonal migration).</p> <p>1.11 Development of standardised annual dolphin and habitat status reporting template, training of staff trained in statistical data analysis and report production; production and review of annual dolphin and habitat status reports by steering committee, circulation of report to relevant stakeholders.</p> <p>1.12 Analyses and reports on fishermen, fisheries and socio-economic survey data; dissemination of report to relevant stakeholders and steering committee.</p> <p>1.13 Production of policy guiding documents from baseline research, survey and monitoring studies.</p> <p>1.14 Identification of priority dolphin river segments,</p>	<p>fishery data collection from the landing and market sites. The survey is due to start early in next reporting period.</p> <p>1.9 The winter standardised dolphin and habitat survey delayed as a result of adverse weather upstream in the traditional boat construction site, in addition to the permission issues outlined above. First full-scale survey will be the early summer/pre-monsoon standardised dolphin and habitat survey , which began in the 2nd week of April</p> <p>1.10 Habitat surveys began in March 2011, after obtaining necessary permission. Basic and advanced statistical courses using R have been developed. Manual also been developed for Distance Sampling and the software package Presence. (Annex 3.15). Training will also be provided during the analysis of the survey data at WII during the first quarter of Year 2.</p> <p>1.11 Due in year 2 following fishermen survey</p> <p>1.12 Due towards the end of year 2 following analysis of survey data</p> <p>1.13 Due in year 2</p> <p>1.14 Due in year 3</p> <p>1.15 Due in year 3</p> <p>1.16 Manuscript preparation will begin in year 2 following analysis of survey data and completion of MSc projects.</p>
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<p>development of PA network discussion paper; production of report circulated to relevant stakeholders and steering committee.</p> <p>1.15 Draft PhD theses produced for review.</p> <p>1.16 ZSL scientific meeting on integrated river dolphin conservation and sustainable ecosystem services.</p> <p>1.17 Preparation and submission of at least four manuscripts for publication in peer-reviewed scientific journals</p>		
<p>Output 2. Enhanced capacity of local authorities and fishing communities for dolphin population recovery and for contributing towards wider-scale ecosystem management</p>	<p>2a. Conventional and novel community outreach and awareness activities in 30 prioritised dolphin areas; 30 DCN members trained and supported (Yr 1–3).</p> <p>2b. Sustainable community-based river dolphin tourism pilot project developed; min. 10 DCN members trained in dolphin-watching guided tours by Yr 3.</p> <p>2c. Pilot projects in small-scale native species aquaculture and alternative livelihoods in two identified dolphin hotspots; local stakeholders trained in fisheries resource management and enforcement by Yr 3.</p> <p>2d. Dolphin Rapid Response Team (DRRT) established; project staff and DCN members trained in stranded dolphin releases and carcass collection; at least 50 fishermen trained in entangled dolphin releases (Yr 1).</p> <p>2e. Fisherman surveys/dialogue on the use of dolphin oil and initiatives to stop use of dolphin oil, data gathered, size and trend in the trade assessed by Yr 2.</p>	<p>Thirty DCN members have been identified and engaged as the key people for the community engagement activities. Required education tools preparation are in draft stages, which will be finalised and then DCN Members will be trained to undertake these activities within next reporting period. A cost benefit analysis of the dolphin eco-tourism will be conducted in year-2, based on which the follow ups will be conducted in year-3. Medicinal and aromatic plant (MAP) has been identified as one of the potential alternate livelihoods. A discussion with a local MAP expert, Dr. M. Ahmed, was held for a cost benefit analysis in year-2. Following the cost-benefit analysis, a MAP pilot project will be undertaken. Establishment of Dolphin Rapid Response Team (DRRT) and training to the 30 DoEF staff nearest to 30 DC in stranded dolphin releases and carcass collection was delayed due to the permission issue. Separate permission will be applied for for this activity, and it will be undertaken in the next reporting period. The fishermen engagement activities in dolphin oil bait fishing are being identified. The study on the use of dolphin oil and initiatives to stop use of dolphin oil, data gathered, size and trend in the trade will be conducted and completed in year 2. As an attempt to develop cross-ecosystem linkages with Ganges River Programme for skills and information, groups working for the conservation of the species in Ganges River System has been identified and linkages established. Study tours in these groups will be conducted in year 2. Self-regulatory mechanisms for natural resource management in fishing communities will be enhanced in year-2 and will be completed in year 3. Establishment of dolphin ambassadors and their training will be completed in year 2.</p>

	<p>2f. Cross-ecosystem linkages developed with Ganges River programmes for exchange of skills and information; study tours conducted (Yr 2).</p> <p>2g. Self-regulatory mechanisms for natural resource management in fishing communities enhanced (Yr 2-3).</p> <p>2h. Dolphin ambassadors established; local women / youth leaders plus celebrities (Yr 2).</p>	
<p>2.1 Development of material and tools for community outreach and awareness activities; training of at least 2 programme staff and 30 DCN members.</p> <p>2.2 Community engagement and awareness programmes in 30 prioritised dolphin areas by DCN members with support on an on-going basis.</p> <p>2.3 Establishment of Dolphin Rapid Response Team (DRRT) with equipment for dolphin carcass sample storage and transportation in 30 sites, training of relevant programme staff and 30 DCN members in stranded dolphin releases and carcass collection.</p> <p>2.4 Training of fishermen in entangled dolphin releases by trained DCN members and programme staff in dolphin core areas.</p> <p>2.5 Annual Dolphin Days and review meetings and refresher workshops for project staff and DCN members.</p> <p>2.6 Intensive fishing community engagement and awareness programmes along the Brahmaputra mainstream (during the upstream journey of the survey boat).</p> <p>2.7 Training and establishment of Dolphin ambassadors.</p> <p>2.8 Study on the use of dolphin oil, size and trade,</p>		<p>2.1 Development ongoing and will be completed in the early part of year 2, followed by the training to the relevant project staff including DCN members and initiation of community outreach and awareness activities.</p> <p>2.2 Awareness programmes will begin following the completion of material and tools. Discussion have been held with PACE and Earthbeat regarding potential programmes</p> <p>2.3 This activity has not started because handling of Gangetic dolphins requires permission from the DoEF and MoEF, which has thus far not been granted. A separate permission application will be submitted to these agencies in year 2, and following permission, this activity will begin.</p> <p>2.4 See above: the project does not currently have permission to handle dolphins.</p> <p>2.5 This will be conducted in conjunction with the National Dolphin Day (5th October) or International freshwater Dolphin Day (24th October) from year 2 onwards.</p> <p>2.6 This will be conducted while the boat travels upstream after the premonsoon survey. The activity was originally planned for year 1 Q4, but delayed until year 2 Q4 due to change in the project start date</p> <p>2.7 Establishment of dolphin ambassadors and their training will be completed in year 2.</p> <p>2.8 Activities regarding fishermen and community engagement in dolphin oil bait fishing are currently being identified. The study will be conducted and completed in year 2.</p> <p>2.9 SWOT analysis of DCN sites and members undertaken and network finalised. Staff member appointed as DCN coordinator For dolphin releases and carcasses, see 1.7 regarding handling dolphins</p> <p>2.10 Meetings have been held with fisheries department and local aquaculture experts. A partnership is being developed with NEDFi (North Eastern Development Finance Corporation Limited) to initiate development of water hyacinth based handicraft in the poor fishermen communities. Pilot projects are expected in year 2.</p> <p>2.11 Due year 2/3, following pilot projects.</p>

<p>production and circulation of report to relevant stakeholders; initiatives for stopping use of dolphin oil, protection and awareness-raising of fishermen in hotspots coordinated by DCN members.</p> <p>2.9 DCN activities in 30 priority sites across Brahmaputra Valley by trained DCN members supported by project core staff (land-based dolphin and habitat monitoring surveys (weekly); fishermen community engagement activities, dolphin stranded dolphin releases and carcass collection, protection, research support activities, monthly reporting etc).</p> <p>2.10 Pilot controlled projects in small-scale native species aquaculture and alternative supportive livelihoods (medicinal and aromatic cash crops) in two identified dolphin hotspots; training of selected local stakeholders in fisheries resource management (traditional, artisanal and subsistence fishing methods) and enforcement; setup of community alliance.</p> <p>2.11 Cost-benefit analysis of aquaculture and alternative supportive livelihoods, circulation of report with recommendations to relevant stakeholders and steering committee.</p> <p>2.12 Training of 10 DCN members in dolphin-watching guided tours; Initiation of community-based river dolphin tourism pilot project.</p> <p>2.13 Study tour of Ganges River programmes; establishment of cross-ecosystem linkages for exchange of skills and information.</p>	<p>2.12 Due in year 2/3</p> <p>2.13 Due in year 2</p>
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<p>Output 3. Local and national stakeholder supported recovery plans and improved protective mechanisms for Brahmaputra River dolphins and regional freshwater ecosystem</p>	<p>3a. Site-specific plans, regional species recovery plan (SRP); PHVA and stakeholder workshops (Yr 2,3). 3b. Advocacy of SRP to relevant lead agencies and on integration of the plan into Brahmaputra River Action Plan and national species planning by end of Yr 3. 3c. Policy leveraging in regional development plans; government officials educated and lobbied to ensure regulation of fishing and wildlife; 5 staff trained in advocacy and lobbying techniques (Yr 2). 3d. Community alliance and participatory enforcement activities initiated in dolphin hotspot areas (Yr 2-3).</p>	<p>The majority of work towards creating recovery plans and improved protection for the river dolphins will take place towards the end of year 2 and the beginning of year 3. The recovery plans and policy leveraging are dependent on the baseline data which is being collected and analysed during the first part of year 2.</p>
<p>3.1 Training workshop in PHVA, site-specific stakeholder workshops for developing site-specific plans; plans submitted to DoEF for approval. 3.2 Multi-stakeholder workshop for development of regional Species Recovery Plan (based on synthesised baseline information and policy guiding documents); plan submitted to MoEF for approval. 3.3 Training of 5 dolphin programme core staff in advocacy and lobbying; initiation of policy leveraging in regional development plans to ensure regulation of fishing and wildlife. 3.4 Advocacy of Species Recovery Plan to relevant lead agencies and on integration of the plan into Brahmaputra River Action Plan and national species planning by trained programme core staff. 3.5 Development of participatory enforcement plan; initiation of activities in all dolphin hotspot areas coordinated by DCN members.</p>	<p>All activities due in year 3</p>	

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal:			
Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Sub-Goal: Brahmaputra River dolphin population is safeguarded and viable in the long-term, and Brahmaputra riverine ecosystem is well-conserved, regenerating and providing sustained and equitable services to local fishing communities and beyond	Surveys show clear evidence that dolphins are at least stable, fish populations in dolphin hotspots are stable or increasing, fishing communities have increased income and security from products yielded from improved management of rivers, and an increased portion of the riverine ecosystem is under protected area management within five years of end of project.	Annual dolphin population monitoring reports, fishery reports, socio-economic survey reports Protected area management reports	
Purpose: To initiate a long-term integrated conservation programme for the Ganges River dolphin in the Brahmaputra River system and to support ecosystem services through research and monitoring, capacity building, environmental awareness and participatory conservation action	1. Improved information on dolphin population dynamics and threats for effective management and implementation of conservation strategy. 2. Adoption of ecosystem management recommendations by relevant agencies (forest, fisheries, water, energy, industries etc). 3. Decline in dolphin mortality through poaching and by-catch.	Survey and status reports Management plans and recommendations	Local government policies and communities remain supportive Political stability in the region / country
Outputs: 1. Coordination framework and institutionalised monitoring and reporting systems at the Brahmaputra River basin level in Assam	1a. An improved, appropriately equipped and trained research and standardised monitoring unit established by Yr 1 (with at least five project staff and 30 community-based Dolphin Conservation Network/DCN members). 1b. Quantified baseline information on dolphin population dynamics, drivers of decline, habitat status and regional ecosystem services produced, disseminated and used for planning; at least four staff trained in resource ecology and animal health by Yr 2. 1c. Standardised post mortem procedures implemented; four trained veterinary dept staff (Yr 1). 1d. Standardised boat-based dolphin surveys (seasonal) along the Brahmaputra River system (Yr 1-3). 1e. Land-based dolphin monitoring surveys (weekly) in 30 priority sites across Brahmaputra Valley (Yr 1-3). 1f. Fishery data at landing and market sites collected	1a. Protocols, training manuals and data-recording forms for standardised boat- and land-based dolphin surveys; reports and evaluation summaries by training co-ordinator; one purpose-built boat for dolphin surveys and community engagement; equipment in place with trained staff. 1b. Technical reports on impact assessments (on dolphins, habitat and ecosystem services, incl. policy analysis) reviewed by experts and Steering Committee (SC); scientific spatial database for dolphins and	Project staff and trained DCN members remain active in relevant positions Research staff are well qualified and motivated to undertake the work Survey boats are well maintained and remain operational Fishing communities remain cooperative

	<p>and analysed; fishermen surveys conducted in the same 30 priority sites (Yr 1-2).</p> <p>1g. Fishermen community socio-economic surveys in the same 30 identified sites (Yr 1-2).</p> <p>1h. Annual Dolphin And Habitat Status Reports produced and disseminated to stakeholders; at least five core staff trained in statistical data analysis (Yr 1-3).</p> <p>1i. Priority dolphin river segments identified by Yr 2.</p> <p>1j. Ecosystem information synthesised for inclusion in regional plans and statutory processes around threatened / protected species and freshwater ecosystems by Yr 3.</p> <p>1k. Research information disseminated by Yr 3.</p>	<p>habitat established.</p> <p>1c. Post-mortem reports; report and evaluation summary by trainers.</p> <p>1d,e. Survey and monthly reports; high-resolution habitat map of Brahmaputra ecosystem.</p> <p>1f. Fisheries report.</p> <p>1g. Socio-economic survey reports with feedback from SC and experts.</p> <p>1h. Standardised monthly progress and annual status reports with feedback from SC and experts.</p> <p>1i. Maps and report.</p> <p>1j. Synthesised report.</p> <p>1k. Academic and public media articles and presentations.</p>	
<p>2. Enhanced capacity of local authorities and fishing communities for dolphin population recovery and for contributing towards wider-scale ecosystem management</p>	<p>2a. Conventional and novel community outreach and awareness activities in 30 prioritised dolphin areas; 30 DCN members trained and supported (Yr 1–3).</p> <p>2b. Sustainable community-based river dolphin tourism pilot project developed; min. 10 DCN members trained in dolphin-watching guided tours by Yr 3.</p> <p>2c. Pilot projects in small-scale native species aquaculture and alternative livelihoods in two identified dolphin hotspots; local stakeholders trained in fisheries resource management and enforcement by Yr 3.</p> <p>2d. Dolphin Rapid Response Team (DRRT) established; project staff and DCN members trained in stranded dolphin releases and carcass collection; at least 50 fishermen trained in entangled dolphin releases (Yr 1).</p> <p>2e. Fisherman surveys/dialogue on the use of dolphin oil and initiatives to stop use of dolphin oil, data gathered, size and trend in the trade</p>	<p>2a. Community engagement tools and material (local radio, press, theatre troupe, posters, education material); training reports.</p> <p>2b. Pilot tourism project implementation and assessment reports, training report.</p> <p>2c. Assessment and training reports.</p> <p>2d. Training and monthly progress reports.</p> <p>2e. Assessment report.</p> <p>2f. Reports on study tours with Ganges River programmes.</p> <p>2g,h. Monthly field reports.</p>	<p>Fisheries department, fishing communities maintain the goodwill required for local co-operation and for co-operation with DoEF</p> <p>Good relationships remain between Ganges and Brahmaputra dolphin conservation programmes</p> <p>Trained fishermen supportive</p> <p>Co-operative relations between villagers and DoEF can be</p>

	<p>assessed by Yr 2.</p> <p>2f. Cross-ecosystem linkages developed with Ganges River programmes for exchange of skills and information; study tours conducted (Yr 2).</p> <p>2g. Self-regulatory mechanisms for natural resource management in fishing communities enhanced (Yr 2-3).</p> <p>2h. Dolphin ambassadors established; local women / youth leaders plus celebrities (Yr 2).</p>		developed to ensure effective and equitable partnership
3. Local and national stakeholder supported recovery plans and improved protective mechanisms for Brahmaputra River dolphins and regional freshwater ecosystem	<p>3a. Site-specific plans, regional species recovery plan (SRP); PHVA and stakeholder workshops (Yr 2,3).</p> <p>3b. Advocacy of SRP to relevant lead agencies and on integration of the plan into Brahmaputra River Action Plan and national species planning by end of Yr 3.</p> <p>3c. Policy leveraging in regional development plans; government officials educated and lobbied to ensure regulation of fishing and wildlife; 5 staff trained in advocacy and lobbying techniques (Yr 2).</p> <p>3d. Community alliance and participatory enforcement activities initiated in dolphin hotspot areas (Yr 2-3).</p>	<p>3a,b. Plans checked, approved and implemented by MoEF.</p> <p>3c. Training reports.</p> <p>3d. Monthly field reports and annual status reports assessed for trends in illegal activities.</p>	Baseline data ready for PHVA and for developing plans

Activities (details in workplan)

1. Coordination framework and institutionalised monitoring and reporting systems at the Brahmaputra River basin level in Assam
 - 1.17 Recruitment of two Indian scientists with relevant experience in freshwater ecology; recruitment of 2 local research assistants; setup of ToRs and contracts.
 - 1.18 Completion of purpose-built boat; additional river boat, procurement of monitoring and sample analysis equipment.
 - 1.19 Development of GIS database system for Brahmaputra River dolphin and ecosystem with detailed design specification, training of staff in its use.
 - 1.20 Development of protocols, training material and data recording forms and training of at least 5 programme core staff and 30 DCN members in standardised land-based dolphin surveys.
 - 1.21 Land-based dolphin and habitat monitoring surveys (weekly) with monthly reporting in 30 priority sites across Brahmaputra Valley.
 - 1.22 Specific research studies for quantifying factors impacting on dolphins and wider ecosystem; PhD enrolment of identified project staff.
 - 1.23 Development of standardised dolphin post mortem procedures; training of at least 4 veterinary college dept staff in post-mortem, necropsy and pathology.
 - 1.24 Development of detailed survey design, data recording forms and procedures for fishermen surveys, fishing community socio-economic surveys and fishery data collection at landing and market sites; training of DCN members and programme staff in interview techniques, undertaking of surveys.
 - 1.25 Development of protocols, training material and data recording forms, training workshop in standardised boat-based dolphin surveys (at least 5 programme core staff and 30 DCN members).

- 1.26 Seasonal standardised dolphin and habitat surveys (2 early summer/pre-monsoon, 2 monsoon-mainly in the tributaries, 3 winter surveys) across the Brahmaputra mainstream and its tributaries (inc. acoustic and sample collection/analyses); populating of database, production and circulation of report and maps to relevant stakeholder and steering committee (for monitoring status and documenting seasonal migration).
- 1.27 Development of standardised annual dolphin and habitat status reporting template, training of staff trained in statistical data analysis and report production; production and review of annual dolphin and habitat status reports by steering committee, circulation of report to relevant stakeholders.
- 1.28 Analyses and reports on fishermen, fisheries and socio-economic survey data; dissemination of report to relevant stakeholders and steering committee.
- 1.29 Production of policy guiding documents from baseline research, survey and monitoring studies.
- 1.30 Identification of priority dolphin river segments, development of PA network discussion paper; production of report circulated to relevant stakeholders and steering committee.
- 1.31 Draft PhD theses produced for review.
- 1.32 ZSL scientific meeting on integrated river dolphin conservation and sustainable ecosystem services.
- 1.33 Preparation and submission of at least four manuscripts for publication in peer-reviewed scientific journals.

2. Enhanced capacity of local authorities and fishing communities for dolphin population recovery and for contributing towards wider-scale ecosystem management

- 2.14 Development of material and tools for community outreach and awareness activities; training of at least 2 programme staff and 30 DCN members.
- 2.15 Community engagement and awareness programmes in 30 prioritised dolphin areas by DCN members with support on an on-going basis.
- 2.16 Establishment of Dolphin Rapid Response Team (DRRT) with equipment for dolphin carcass sample storage and transportation in 30 sites, training of relevant programme staff and 30 DCN members in stranded dolphin releases and carcass collection.
- 2.17 Training of fishermen in entangled dolphin releases by trained DCN members and programme staff in dolphin core areas.
- 2.18 Annual Dolphin Days and review meetings and refresher workshops for project staff and DCN members.
- 2.19 Intensive fishing community engagement and awareness programmes along the Brahmaputra mainstream (during the upstream journey of the survey boat).
- 2.20 Training and establishment of Dolphin ambassadors.
- 2.21 Study on the use of dolphin oil, size and trade, production and circulation of report to relevant stakeholders; initiatives for stopping use of dolphin oil, protection and awareness-raising of fishermen in hotspots coordinated by DCN members.
- 2.22 DCN activities in 30 priority sites across Brahmaputra Valley by trained DCN members supported by project core staff (land-based dolphin and habitat monitoring surveys (weekly); fishermen community engagement activities, dolphin stranded dolphin releases and carcass collection, protection, research support activities, monthly reporting etc).
- 2.23 Pilot controlled projects in small-scale native species aquaculture and alternative supportive livelihoods (medicinal and aromatic cash crops) in two identified dolphin hotspots; training of selected local stakeholders in fisheries resource management (traditional, artisanal and subsistence fishing methods) and enforcement; setup of community alliance.
- 2.24 Cost-benefit analysis of aquaculture and alternative supportive livelihoods, circulation of report with recommendations to relevant stakeholders and steering committee.
- 2.25 Training of 10 DCN members in dolphin-watching guided tours; Initiation of community-based river dolphin tourism pilot project.
- 2.26 Study tour of Ganges River programmes; establishment of cross-ecosystem linkages for exchange of skills and information.

- 3. Local and national stakeholder supported recovery plans and improved protective mechanisms for Brahmaputra River dolphins and regional freshwater ecosystem
- 3.6 Training workshop in PHVA, site-specific stakeholder workshops for developing site-specific plans; plans submitted to DoEF for approval.
- 3.7 Multi-stakeholder workshop for development of regional Species Recovery Plan (based on synthesised baseline information and policy guiding documents); plan submitted to MoEF for approval.
- 3.8 Training of 5 dolphin programme core staff in advocacy and lobbying; initiation of policy leveraging in regional development plans to ensure regulation of fishing and wildlife.
- 3.9 Advocacy of Species Recovery Plan to relevant lead agencies and on integration of the plan into Brahmaputra River Action Plan and national species planning by trained programme core staff.
- 3.10 Development of participatory enforcement plan; initiation of activities in all dolphin hotspot areas coordinated by DCN members.

4. Project Management, Dissemination and Reporting

- 4.1 Establishment of steering committee, project management reporting procedures and ToRs, preparation of detailed project implementation plans
- 4.2 Monthly progress meetings and regular site visits.
- 4.3 Preparation and submission of half yearly, annual and final project reports, articles for DI newsletter to Defra.
- 4.4 Updating of project website pages inc. downloadable documents (resource centre).
- 4.5 Media coverage, attendance of meetings and conferences (such as SSC-Cetacean Specialist Group, marine mammal congress) at which findings from Darwin project work are presented / disseminated.

Monitoring activities:

Indicators

- 1. Coordination framework and institutionalised monitoring and reporting systems at the Brahmaputra River basin level in Assam
 - 1.1 ToRs and contracts in place (Yr 1).
 - 1.2 Purpose-built boat; additional river boat and monitoring and sample analysis equipment in operation (Yr 1).
 - 1.3 GIS database system in operation, detailed design specification, manual and training report (Yr 1).
 - 1.4 Protocols, training material and data recording forms, training report (Yr 1).
 - 1.5 Monthly reporting from 30 priority sites (Yr 1-3).
 - 1.6 Research study progress and final reports (Yr 1-2).
 - 1.7 Dolphin post mortem procedures; training report (Yr 1).
 - 1.8 Survey designs, data recording forms and procedures; training reports (Yr 1).
 - 1.9 Protocols, training material and data recording forms, training report (Yr 1).
 - 1.10 Survey reports, maps, populated database, stakeholder and steering committee feedback (Yr 1-3).
 - 1.11 Standardised annual dolphin and habitat status reporting template, training report; reports and feedback from steering committee and relevant stakeholders (Yr 1-3).
 - 1.12 Reports and feedback from relevant stakeholders and steering committee (Yr 2).
 - 1.13 Policy guiding documents (Yr 2).

- 1.14 Priority dolphin river segments report, PA network discussion paper; feedback from relevant stakeholders and steering committee (Yr 2).
- 1.15 PhD theses draft (Yr 3).
- 1.16 ZSL scientific meeting presentations (Yr 3).
- 1.17 Copies of manuscripts (Yr 2-3).

2. Enhanced capacity of local authorities and fishing communities for dolphin population recovery and for contributing towards wider-scale ecosystem management

- 2.1 Material and tools; training report (Yr 1-2).
- 2.2 Monthly progress reports, field visits (Yr 1-3).
- 2.3 Monthly progress reports, field visits, training report (Yr 1-3).
- 2.4 Monthly progress reports, field visits, training report (Yr 1-3).
- 2.5 Meeting reports, media coverage (Yr 1-3).
- 2.6 Report and feedback (Yr 1-3).
- 2.7 Media coverage, reports (Yr 1-3).
- 2.8 Reports, field visits (Yr 2-3).
- 2.9 Monthly reports, field visits (Yr 1-3).
- 2.10 Monthly reports, field visits (Yr 2-3).
- 2.11 Report and feedback from relevant stakeholders and steering committee (Yr 3).
- 2.12 Training report, field visits and progress reports (Yr 2-3).
- 2.13 Study tour report (Yr 2).

3. Local and national stakeholder supported recovery plans and improved protective mechanisms for Brahmaputra River dolphins and regional freshwater ecosystem

- 3.1 Training report, site-specific plans (Yr 3).
- 3.2 Species Recovery Plan (Yr 3).
- 3.3 Training report, progress reports, revised plans (Yr 3).
- 3.4 Progress reports, revised Brahmaputra River Action Plan and national species plan (Yr 3).
- 3.5 Participatory enforcement plan; monthly report and field visits (Yr 3).

4. Project Management, Dissemination and Reporting

- 4.1 Steering committee meeting minutes, project management reporting procedures and ToRs, project implementation plans (Yr 1-3).
- 4.2 Monthly progress meetings minutes, site visit reports (Yr 1-3).
- 4.3 Half yearly, annual and final project reports, articles, Defra review reports (Yr 1-3).
- 4.4 Websites and downloadable documents (Yr 1-3).
- 4.5 Presentations and media coverage material (Yr 1-3).