

# 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.

## Darwin Project Information

Project Ref Number	Project 162/15/017
Project Title	Implementing a Recovery Plan for the Critically Endangered Pygmy Hog in Assam.
Country(ies)	India
UK Contract Holder Institution	Durrell Wildlife Conservation Trust
UK Partner Institution(s)	Zoological Society of London
Host country Partner Institution(s)	1. Forest Department (FD), Ministry of Environment and Forests, Government of Assam. 2. IUCN – SSC Pigs Peccaries and Hippos Specialist Group (PPHSG) 3. Pygmy Hog Conservation Programme Research & Breeding Centre (PHCPRBC), Basistha, Assam
Darwin Grant Value	£182,000
Start/End dates of Project	Apr 2006 – Mar 2009 (July 2006 start)
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 Apr 2008 – 31 Mar 2009 Annual Report 3
Project Leader Name	Dr. John E. Fa
Project website	None at present
Author(s), date	John E. Fa, Goutam Narayan

## 1. Project Background

The main purpose of this project is to improve the conservation status of the critically endangered pygmy hog (*Porcula salvania*) in Assam, enhance habitat management practices of tall grasslands in Manas Tiger Reserve (MTR) - a UNESCO World Heritage Site, which supports the last remaining population of this species - and expand the species' distribution by establishing new populations with local captive-bred hogs in a former range area, the Sonai Rupai Wildlife Sanctuary (SRWS) and the adjacent Nameri National Park (NNP). This project will assist India in implementing the CBD and help MTR be removed from the 'List of World Heritage Sites in Danger'. Specifically, it will 1) develop human capacity and procedural mechanisms in wildlife and habitat monitoring, data analysis and status reporting; 2) improve management of the tall-grasslands through enhanced knowledge of the status of the habitats and the impact of factors including grassland burning and extraction activities on pygmy hog densities and other associated species; 3) reintroduce captive-bred animals in one or more areas within their recent known range, and implement improved habitat management and protection of these areas via training of Forest Department personnel, and 4) build community involvement and support for the conservation of the tall grasslands and its wildlife including, (but not confined to pygmy hogs) through the establishment of community-based biodiversity and environmental education, outreach and sustainable development programme. Delivering

these objectives coincides with key objectives of the Environment and Forest Departments of the Govt. of Assam and (Union) Govt. of India, under the auspices of a renewed MOA and new 5-year strategic development plan.

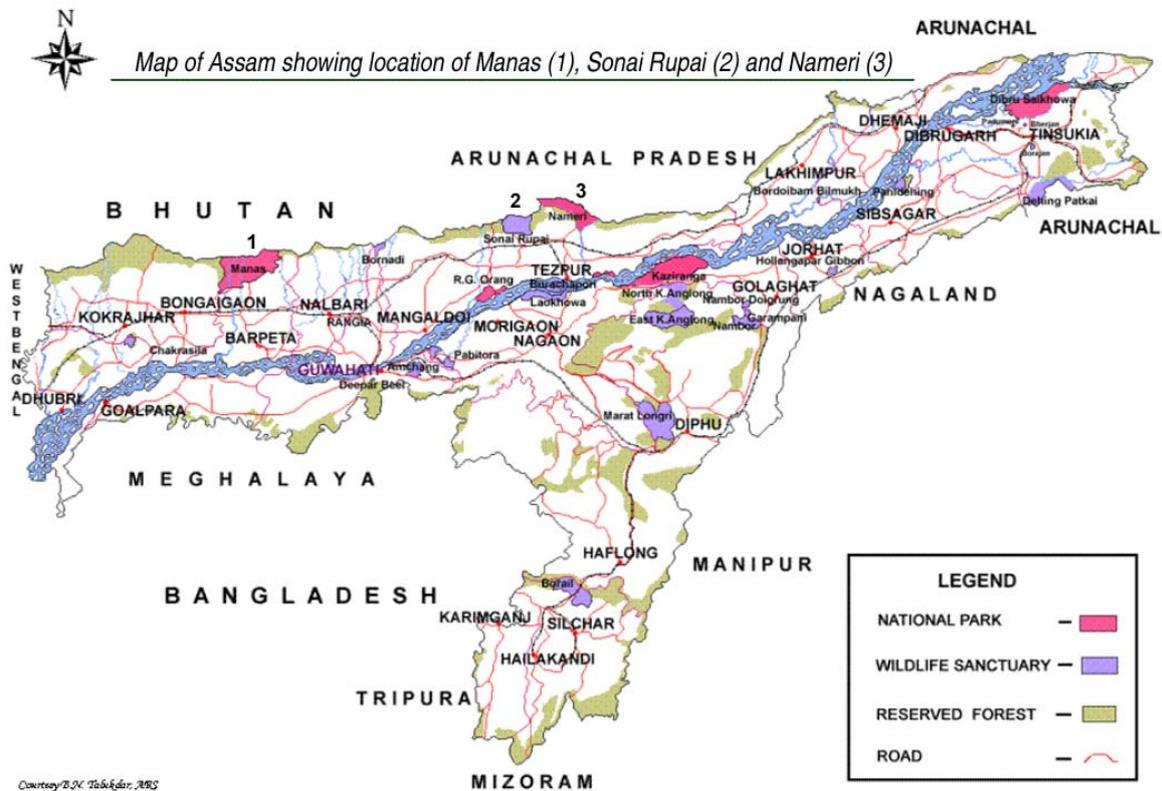


Fig. 1. Map of Assam, showing location of study sites

## 2. Project Partnerships

The Darwin Pygmy hog project has three main partners: the Ministry of Environment and Forests, Government of Assam (MoEF, GoA), The Forest Department of Assam (FD), under the MoEF, GoA and The Pygmy Hog Conservation Programme Research and Breeding Centre (PHCPRBC). The PHCPRBC at Basistha, with a pre-release centre at Potasali, is run by the Durrell Wildlife Conservation Trust in close collaboration with the IUCN/SSC Pigs, Peccaries & Hippos Specialist Group (PPHSG). These facilities focus on captive breeding, field conservation and environmental awareness.

The project has worked closely, and most productively, with the Forest Department of Assam in implementing capacity-building, and preparing for field work in the Manas National Park (MNP); the core area of the larger MTR, and where the last remaining populations of the pygmy hog are still found. Project partnership has been most effective, and the project has received the fullest support and encouragement from even the highest level at the MoEF. We have also initiated very promising collaborations with a number of NGOs in the region.

## 3. Project progress

### 3.1 Progress in carrying out project activities

The project managed to initiate and conduct all operations envisaged for the year. The main highlight of this period was release of captive bred pygmy hogs in the wild. In May 2008, 16 captive bred pygmy hogs were successfully released in a 'vacant', but now well protected, grassland in Assam, potentially creating a second wild population of this critically endangered species. The preparation for re-introduction of the second batch of hogs in the wild is

underway. In addition, some crucial aspects of the project, particularly the outreach activities likely to have positive impact upon the security and management of the existing and reintroduced pygmy hog populations, were also strengthened.

#### **(a) Pygmy hog and grasslands surveys**

Rapid surveys were carried out in all three ranges of Manas National Park. Data collection was done along the transects covered previously by locating them using GPS. The surveys revealed evidence of the continuing survival of small populations of the pygmy hogs in Manas. However, no significant improvement was found in the habitat quality in the grasslands of Bansbari Range, while tall grasslands in both Bhuyanpara and Panbari Ranges had evidently recovered to some extent from illegal livestock grazing and thatch collection following enhanced community participation in habitat protection. The notable exception was Bhuyanpara's Kokilabari Farm area, a large of which had become reasonably good grassland habitat after the seed farm had closed down, but with spreading of agricultural activity the grasslands are now disappearing rapidly.

Surveys intended to locate additional release sites with suitable habitat were carried out again in the grasslands of Sonai Rupai Wildlife Sanctuary. Similar surveys were also carried out in Orang Wildlife Sanctuary and Nameri National Park to assess the grasslands there as a potential release site. No evidence of any existing pygmy hog populations were found either of these sites, despite the fact that both areas lie within the recent known or assumed distribution range of this species. While the habitat in Orang appeared suitable, the areas of Nameri that had good alluvial grassland in the past was clearly overgrazed by livestock. Although permanent cattle camps (*khuntis*) have been shifted out of the area, large number of cattle continues to use the area during daytime.

Barnadi Wildlife Sanctuary was also surveyed but the situation has not improved much, so it cannot yet be considered for future release of hogs. Most of the grasslands have become degraded or have undergone succession to woodland. Frontline field staff shortages, drinking water scarcity in the protection camps, poor communication network and general lack of funds for vehicles and roads or even for clearing patrolling path and fire breaks has crippled this small sanctuary where no pygmy hog been reliably reported since early 1990s and grass fire is one of the biggest threats.

#### **(b) Pygmy hog behaviour studies**

The behavioural study on the pygmy hogs conducted by a student was concluded. The study focused on examining the behaviour of the hogs in captive conditions at Basistha compared to the behaviour with hogs kept under semi-wild conditions at the pre-release centre in Potasali. Sampling was carried out from December 2007 to April 2008, with data collected from 25 individuals. Since the study period coincided with the breeding season, much of the observations pertained to breeding behaviour. Fifteen minute long focal animal observations on individuals housed in the breeding enclosures were used to measure various behavioural events, with group scans between the focal animal observations to measure various states. Some sequence scans were also made opportunistically. The majority of observations were made on breeding pairs. In Potasali, where instantaneous scans were the priority, observations were made on 17 individuals, with focal animal sampling happening whenever hogs were visible, particularly during the feeding hours. The percentage time spent in different behavioural states was calculated across individuals from group scans to obtain time activity budgets and the rates of a particular behavioural event were calculated from frequency of occurrence of that behaviour in focal animal samples.

An ethogram was constructed using the behavioural observations conducted during focal animal sampling and instantaneous scans. Comparisons were made between observation at Basistha and Potasali in order to assess the adaptability of the animal to novel situations and environments. It was seen that the hogs in both sites spent more time foraging than on the other activities. In general the pattern of pygmy hog behaviour concurs with previous reports for other suids. Certain behaviour such as displaying and rump-sniffing which are associated with breeding were restricted to the males. In the pre-release centre, hogs exhibited behaviour not seen in the breeding centre. The results obtained from this study clearly show that the hogs, despite being maintained in captivity since their birth, and over several generations, still exhibit the potentials to adapt to new situations as well as display behaviour reflecting to their natural environment. This indicates a positive prognosis for the future of the reintroduction project (see Annex 3, M.Sc. Wildlife thesis – *A behavioural profile of captive bred pygmy hogs prior to reintroduction into the wild*)

### **(c) Fire studies and land cover assessment of Manas National Park**

A study on occurrences of fire in Manas National Park between 2000 and 2008 was conducted to help us recommend a better management plan for the pygmy hog grasslands. In the study, we analyzed spatial and temporal patterns of remotely identified fires within Manas NP. We used data for 781 active fires, obtained from the Terra satellite MODIS (Moderate Resolution Imaging Spectroradiometer) images, detected in the MNP during the dry seasons (October-May) of 2000-2008. Number of annual fires increased significantly from 12 in the 2000-1 dry season, to over 100 after 2005-6. Most fires (85%) were recorded in December and January each year. Over half of all fires occurred in tall grasslands, but highest density of fires was found in wetland and riverine vegetation. Distance of fires to roads, rivers and the park boundary was estimated in a GIS; most fires occurred closest to rivers, roads and the park boundary. A map of fire intensity was generated using a kernel density estimation tool. There were three most frequently burnt areas in the MNP, but also clearly unburned sites. According to our results, we recommend that remotely detected fires can be usefully employed as a tool to understand susceptibility of areas and habitats to burning in protected areas. In order to reduce the threats and to conserve grassland diversity and its inhabitants, the establishment or improvement of effective fire management is essential. We make three important recommendations from this study that can help minimize the risk of detrimental damage on both grassland diversity and species dependent on the grassland habitat. (see Annex 4, M.Sc. thesis – *Identifying Spatial and Temporal pattern of fire in the Manas National Park, India: Implications for grassland habitat conservation*; and Annex 5, a report/paper on '*Patterns of active fires in the Manas National Park, India: an 8-year study*').

### **(d) Capacity building**

The project continued its capacity building efforts and ensured that the benefits will accrue despite staff changes through the implementation of an institutionalised on-site on-going modular training programme.

#### *Frontline protection staff*

Follow-up training of frontline protection staff of Sonai Rupai Wildlife Sanctuary and Nameri National Park continued using some trainers and monitors identified during the Darwin training course conducted in collaboration with Zoological Society of London. At least 8 of the trained staff in Sonai Rupai, 4 in Nameri and 2 staff in Orang were engaged in survey and monitoring exercises.

The protection camps and forest guards within our area of operation in Sonai Rupai have been trained to avoid and prevent grass burning and they have restricted fire over the last couple of years (except some cases where it was burnt by local intruders or cowherds).

Lecture and demonstrations were also organised for frontline staff visiting the project sites from forest schools in Assam, Manipur, Mizoram and Arunachal Pradesh.

#### Masters students

Two M.Sc. students completed short-term projects after receiving training and guidance from programme personnel. One of them, from the Wildlife Conservation Society's M.Sc. Wildlife course (based at National Centre for Biological Sciences, Bangalore) carried out the behavioural study on the hogs. The second student from the Imperial College, London, carried out the fire studies. In addition a fresh Masters graduate was recruited and trained to carry out the grasslands studies in Manas.

#### Staff training

Two field assistants from Manas and Potasali were trained in rapid survey techniques for tracking signs of pygmy hogs and differentiating them from tracks and foraging marks of other wildlife in the grasslands. They were also trained to use GPS and to record data, mainly to assist in scientific surveys rather than carry them out independently.

A new field assistant from Nameri area was trained in protocol for feeding and monitoring the hogs at Potasali, maintenance of pre-release enclosures, and survey techniques for tracking pygmy hogs in the wild.

#### School teachers and local NGOs

An educator workshop for conservation of Manas and its grassland habitat was held between 20 and 22 February 2009 at Hajowa Simla, near Kokilabari under Bhuyanpara Range of Manas National Park. The training workshop was organised in collaboration with two local NGOs, *Manas Bhuyanpara Conservation Ecotourism Society* and *Agrang Ecotourism Society*, and was attended by 45 enthusiastic teachers representing 15 middle and high schools from the fringe villages in Bhuyanpara area. Training kits consisting of education resource material (some obtained from Centre for Environment Education), posters and stickers were distributed among the participants. The workshop used a combination of illustrated talks, interactive games, discussions, film shows and field trips to impart training to the teachers with focus on grasslands and threatened wildlife of Manas, particularly the pygmy hog. The training sessions included topics such as concept of ecosystem, components and techniques of EE, threatened wildlife of Manas, conducting nature trails for field observations. (see Annex 6 *photographs*)

Training in bee keeping was started at Potasali for the local villagers. This has also generated considerable interest among visitors and tourists.

Some school teachers and NGO members trained earlier, are being assisted by us in their conservation education efforts around Manas National Park. Unfortunately, with floods cutting off roads, access to most areas around Manas was limited from June to September affecting the extension activities.

#### **(e) Manas training and community centre**

The construction of the Manas training centre at Bansbari is almost complete. The premises are being used by project field staff working in Manas. It will take some more time to fully install all facilities due to shortage of skilled technicians in the area, and breakdown of communication. Efforts are being made to establish a nursery to raise lemon plants as a citrus fencing.

## **(f) Community engagement**

The community conservation initiatives in the three model fringe villages of Manas National Park continue to strengthen the entry level activities started earlier. Human-animal conflict mitigation, popularisation of alternative livelihood options and improvement of Park-people relations are being used for effective conservation of the pygmy hog grasslands in Manas. The villagers are being encouraged to form Self Help Groups (SHGs) to address economic and conflict issues.

Training and counselling of the SHG members were carried out in Barengabari (Bansbari), Thaijoguri (Bhuyanpara), and Sourang (Panbari) villages. Frequent monthly/quarterly meetings were held in all these villages to encourage members to adopt livelihood initiatives to reduce dependence on forest produce. Subsequently, SHG groups started cultivating cash crops such as ginger, chilli, jute, vegetables on their own land or leased plots. In addition beekeeping, and pickle and jam making training given to SHGs has yielded good results with members earning profits from sale in the local market. In Thaijoguri, the women SHG group is making profits through fish farming as a collective enterprise, and selling hand woven products.

To strengthen the operation of existing and new SHGs, training in the account keeping / registration and management of SHGs was carried out in all these villages. Regular monthly contributions by the members and procedure for securing bank loans were also discussed. The SHG members now have started credit and thrift operations among themselves. A local student was trained to maintain the account books and records of the SHG in Barengabari. Spurred by the success of livelihood alternatives, SHG members in the project villages are now interested in participating in conservation initiatives.

Targeting the members of community who go inside the Park for catching small fish and to extract thatch grass, we have started an awareness generation campaign to encourage fish cultivation in the abandoned water bodies in the villages and cultivation of thatch grass or other cash crop in the fields in the months when paddy is not grown.

Frequent crop and livestock raiding, and property damage by elephants, boars and tigers in the project villages has highlighted the need to address the human-animal conflict issues with greater urgency in order to achieve even minimum goals of community conservation initiatives. Sourang is the worst affected among the three villages. Following requests by villagers to mitigate conflict; various options were assessed. Rechargeable spotlights developed by project partner EcoSystems-India were distributed in Sourang. The trip-wire installed by us in the village has been successfully giving advance warning about raiding wild elephants so that the villagers can take appropriate action to reduce damage to crop and property. A very hot variety of local chilly (*bhot jolokia*) saplings have been distributed to SHG members for cultivation. Besides benefiting economically by selling the sapling and fruit of the plant, the chilly can be used effectively as chilly-smear rope barrier and chilly smoke device against wild elephants as demonstrated by the Darwin Initiative sponsored Assam Haathi Project of Chester Zoo and EcoSystems-India.

## **(g) Conservation Breeding and Reintroduction**

Sixteen (7♂♂9♀♀) captive bred hogs were released in Sonai Rupai Wildlife Sanctuary in north-west Assam between 4<sup>th</sup> and 9<sup>th</sup> May 2008. This event not only constituted the first such reintroduction attempt, but the first of a proposed series of releases in this sanctuary; hopefully to be followed by similar series of releases into 'vacant' habitats in two other protected areas within the known or presumed former range of this species in this region.

### Final preparations at the pre-release centre

As mentioned in the last report, 16 (7♂♂ 9♀♀) hogs in three groups were prepared for independent survival in the wild in the three large 'pre-release' enclosures densely planted with

tall grass to simulate their natural habitat. The pre-release routine allowed them to become used to the conditions they will face in the wild and minimises contact they have with humans.

**Marking and health screening:** All animals targeted for release were marked for identification using microchip transponders as well through hair clipping. They were also subjected to regular health screening. Blood samples, rectal and nasal swabs were sent for investigation to veterinary college but no abnormality was found.

**Radio telemetry experiment:** Six adult hogs, two from each group of hogs targeted for release, were fitted with radio-harnesses specially designed for the species about a month before the planned release. Although the radio transmitters worked well, the harness began to cause serious injuries to the hogs within three weeks as the hogs moved rapidly through very thick vegetation and coarse grass. The harnesses were removed and alternate methods were devised to monitor the hogs in the wild.

**Behavioural studies:** The hogs were monitored under the behavioural study. The behaviour of hogs was recorded under a scientific study (mentioned above). It was highly encouraging to see that these hogs started showing naturalistic behaviour within a few weeks at the pre-release facility.

#### Habitat restoration and management at the release site:

The staff and authorities at the two short-listed sites – Sonai Rupai Wildlife Sanctuary and Nameri National Park – were advised to initiate scientific management and restoration of grassland habitat. After signs of improvement at Sonai Rupai, it was decided to carry out the release in May 2008 in the Gelgeli grasslands of the sanctuary.

#### Release and monitoring in the wild

**Transport and reintegration of hogs:** The hogs prepared for independent survival in the wild at the pre-release facility were taken to Sonai Rupai in May 2008. Under the soft release procedure, they were initially kept in release enclosures that were protected from wild elephants and predators using solar powered electric fence and were kept under round-the-clock vigil from a hide on a tree. The three groups of hogs were allowed to reintegrate and get familiarised for a few days before being given the option to escape to the wild after about two weeks.

**Monitoring of released hogs:** The hogs were monitored using indirect signs of activity such as forage marks, footprints, droppings and nests. They were also trained to return to the release enclosure by using some delicacies as bait. Two groups kept returning to the baiting station with reducing frequency for about a month and individuals were identified through body markings during observations from the hide. Presence of active or older nests and foraging marks along with footprints helped in determining the dispersal of the hogs in the grassland.

A video camera trap developed at Indian Institute of Science, Bangalore, was borrowed from Nature Conservation Foundation, Mysore to monitor the hogs. The standard handy-cam housed in a weather-proof casing is triggered by a motion sensor, and the images are recorded on DV tapes. The camera was repeatedly tested at Potasali. The camera was used at the release site near three nests and hogs were caught in camera at two of these sites.

At least three released hog died within a month of release and a male hog did not join any other group after his female group mate died, but instead lived alone in the vicinity of the Gelgeli Protection and Monitoring camp (1.3 km from the release site).

The group compositions of the remaining 12 (5♂♂7♀♀) released hogs could not be accurately determined in the absence of any direct sightings, but it became clear from evidence of recent signs (i.e. nests, forage marks, footprints, and droppings) that at least three groups had established themselves in separate locations within a kilometre of the release site. At least one

of the females that farrowed after the 2008 release separated from her group to raise her young. By mid-July, all the hogs had stopped visiting the 'bait' station, so supplementing feeding was discontinued at the end of July 2008.

Ground surveys were continued in the area in order to monitor the hogs, but after mid-July it became increasingly difficult to enter the grass due to heavy rains, very poor visibility due to the height and density of grass, and above all, serious threat from herds of wild elephants. The Kalamati-Gelgeli road does not remain traversable by motor vehicle in the rainy season between July and October, meaning that PHCP monitoring and caretaking personnel had to walk and wade for 12 km with armed guards to reach Gelgeli Camp. Unfortunately, the presence of a rogue bull elephant in the area constituted a serious risk as it was prone to attack without any apparent provocation, and two forest department workers eventually lost their lives in separate incidents. Another serious problem in Sonai Rupai area was the drug-resistant strains of malaria (both *Plasmodium vivax* and *P. falciparum*) that afflicted several inhabitants of Gelgeli Camp, including two PHCP staff who had to be evacuated to hospital.

**Ground Surveys:** In July 2008, six active nests, four freshly abandoned nests and three degraded pygmy hog nest were found in four different locations. In August, monitoring surveys were limited but four active nests, a freshly abandoned nest and eight degraded nests were found in three different locations. Four of the eight degraded nests found in August were active in July. Evidence of hog activity was recorded from eight separate locations, two of which locations were comprised only rooting/foraging marks, though these are characteristic for the species.

The hogs regularly moved their area main areas of activity, presumably selecting new foraging and nest making sites while avoiding areas with intensive wild elephant activity. In August two of the groups had move 50-100 m southward while in September their area of activity shifted to a new location 100-200 m north/north-east of an area where two active nest and five older nests were found. While searching for the hogs in September five more old nests, not recorded in July or August, were located. Signs of pygmy hog activity were seen at seven different locations over the next two months. While one of the groups moved to a grass sward closer to some waterholes, another group shifted to an area 200 m south-west of the release site. In the drier months of January and February the hogs evidently selected areas with some moisture in the soil where foraging/rooting was easier.

After some extensive areas of the grassland were accidentally burnt in December four burn-over (probably old) nests were found in the area. A couple of new nests were also found at the edge of burnt area, but it could not be ascertained if these were abandoned prior to or during the burning. In addition, six intact pygmy hog nests and four degraded (old) nests were found in the vicinity. Although some foraging signs were noted close to the edge of the burnt area, there were significantly fewer signs of pygmy hog activity in the burnt area.

Besides the footprints and foraging signs hog activity was also indicated by presence of latrines, usually found along hog tracks that tunnel through thick undergrowth of grass. The hog tracks were confirmed by hoof-prints, some of which led to nests; whereas as the hog latrines comprised accumulated droppings of varying freshness spread over 1-2 metre areas.

**Camera trap:** A video camera trap (handy-cam with DV tapes, housed in a weather-proof casing, triggered by a motion sensor; developed at the Centre for Electronic Design and Technology, Indian Institute of Science, Bangalore) was borrowed from Nature Conservation Foundation for monitoring the released hogs in the months of November and February. It was carefully deployed near active nests, causing least possible disturbance to the surroundings to avoid attracting predators. Due to dense growth of grass around the nests it was difficult to

place the camera at a reasonable distance for wider coverage. It was placed barely 1.5 - 2 m from the nest at a height of about 25 cm. A few processed soybean chunks were used as bait (as these do not smell or decompose quickly) for the camera trap.

In November 2008, hogs were videographed near two different nests. Using identification marks (body hair-clipping) it was possible to identify one of the individuals near the second nest as a female that was last seen in end May 2008, a couple of weeks after the release. In February, two other females were videographed near a nest in another area.

The hogs caught in camera appeared healthy and had shiny coats, unlike the somewhat emaciated hogs captured from the wild in Manas in 1996. That the released hogs appeared to be in good health despite harsh weather and sometimes difficult foraging conditions up to nine months after their release was most encouraging in that it not only confirmed their survival, but suggested their successful adaptation to the wild after at least one or (in most cases) two generations of captive management.

**Sightings:** Direct sighting of released hogs were predictably very rare after the animals stopped visiting to the 'bait' station for supplementary food; though it was not anticipated that this would happen as soon as it did. In fact, with the exception of the lone Gelgeli boar, project staff sighted released hogs on only two occasions; viz: a pair seen crossing a path close to the release site in November 2008, and a another male sighted in a wooded area almost 3 km south-east of the release site in May 2009, presumably while moving from one grassland to another. This is the farthest a pygmy hog has been recorded in Sonai Rupai after their release. The forest protection staff also reported hog sightings on 3 occasions after their release.

#### Plans for release of more pygmy hogs in 2009

To augment the reintroduced population in Sonai Rupai, a second release of three social groups of captive bred hogs was planned. Surveys were carried out in the sanctuary from September to November to locate and assess new grassland areas for the second release. A large area, about a kilometre south-east of the first release site was selected for this purpose as being sufficiently close to the first release to facilitate both routine monitoring exercises and likely future contacts between the first and second released animals (i.e. supplementing the existing population, rather than establishing a second 'sub-population' in a different area, which will be done at a later date) and because ground surveys failed to yield any indications of pygmy hog activity, suggesting that the first released hogs had not ventured into this area.

#### Conservation breeding

The conservation breeding and reintroduction programme to release captive bred pygmy hogs into the wild, within the terms of the Darwin project, has focused on producing and preparing the hogs for release.

Altogether 17 (9♂♂ 8♀♀) babies were born in five litters at our Basistha conservation breeding facility under a planned breeding effort. The breeding plan is intended to ensure that only unrelated or distantly related animal are bred and optimal genetic heterozygosity is maintained in captivity. By the end September the captive population stood at 66 (32♂♂34 ♀♀), of which sixty animals were held at Basistha and six at Potasali holding facility. These were in addition to 16 hogs released in Sonai Rupai in May 2008.

Status of the captive hog population on 31 March 2009		
Basistha	Adult captive-born hogs	29 (2.17)
	Juveniles (2008 born)	10 (5.5)
Potasali	HOLDING ENCLOSURES:	
	Adult captive-born hogs	5 (2.3)
	PRE-RELEASE ENCLOSURES:	
	Adult captive-born hogs	8 (4.4)
	Juveniles (2008 born)	7 (2.5)
Total		59 (25.34)

#### Shifting of selected hogs to pre-release centre for 2009 release

For the release of second batch (2009) of pygmy hogs, 15 carefully selected animals were transported from Basistha to Potasali in November-December 2008 in custom-made transportation crates after being restrained, weighed, examined and appropriately sedated with Azaperone. These are kept in three groups of 5 hogs each in separate pre-release enclosures. Initially, these hogs were kept for a week in the smaller nestling / feeding enclosure within each pre-release enclosure and were given regular feeds as they had received in Basistha. While in these nestling enclosures, these hogs learnt about the power fence lines, particularly how to avoid them

The hogs were given access to the larger part of the pre-release enclosures after a week and the quantity of supplementary feed was gradually reduced to adapt to foraging regime in the wild. For a couple of weeks of so the hogs did not visit the nestling / feeding enclosures regularly, but after about three weeks they came in at least once a day, but not necessarily at any fixed time. No inter-group conflict was recorded. It was encouraging to note that the hogs were getting increasingly shy and the flight distance of most of them had increased steadily outside the feeding enclosure.

#### **(i) Meeting in Jersey**

A meeting was held in Jersey in end June 2008 to review and to prepare and action plan for the project activities. Besides the project personnel (John Fa and Goutam Narayan) the meeting was attended by some senior Durrell staff.

#### **3.2 Progress towards Project Outputs**

Substantial progress was made with the project outputs as most targets, except a few were achieved. Severe floods in Manas area and Sonitpur district caused serious operational problems and many planned activities could not be completed on time. These activities have been postponed and are being taken up after the flood waters receded. This will however not affect the budget and will have some impact on timetable delaying some of the project activities a little.

#### **3.3 Standard Output Measures**

Code No.	Description	Year 3 (Total)
8	JF = 10 x 3 weeks; RA = 10 x 3 weeks	Yes
10	Conservation education, awareness and teaching material including conservation education booklet produced.	Resource manual for Final draft of grassland booklet has been prepared
2	2 MSc students trained in conservation research	2

Code No.	Description	Year 3 (Total)
6A	At least 30 trained staff in large mammal monitoring and survey techniques.	14 participated in the follow-up of training
11B	6 scientific papers produced and submitted.	3
3	At least 60 teachers and relevant park staff and members of local groups and NGOs trained in environment education	Total 70 local school teachers (45 in 2008-2009)
9	3 standardised annual large mammal status reports at park level produced.	0
6A	At least 5 park ecologists and monitoring staff trained in habitat assessment techniques.	3 post-graduate students trained
14A	Community seminar, forums and projects	15
10	Vegetation maps; Habitat assessment manual; Pygmy hog habitat suitability and viability model and sensitivity map produced	1 map produced, others under preparation
9	Species/habitat management plans produced for MTR and SRWS/NNP.	0
15A & 15B	National and UK press releases, radio broadcasts.	Over 12 news items and 6 TV items
23	Over £210,000 spent by DWCT in running the PPHSG during the three years of this project.	

**Table 1 Publications**

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £ (if applicable)
<i>Suiform Soundings</i> 2008(1), IUCN-SSC PPHSG Newsletter	First captive bred pygmy hogs ( <i>Porcula salvania</i> ) reintroduced to Sonai Rupai Wildlife Sanctuary, Assam, India. Goutam Narayan, William L. R. Oliver and Parag J. Deka. 2008	IUCN-SSC PPHSG	<a href="http://iucn.org/themes/ssc/sgs/pphsg/home.htm">http://iucn.org/themes/ssc/sgs/pphsg/home.htm</a>	NA
<i>Suiform Soundings</i> 2008(1), IUCN-SSC PPHSG Newsletter	Restoration of the genus <i>Porcula</i> . Stephan M. Funk. 2008.	IUCN-SSC PPHSG	<a href="http://iucn.org/themes/ssc/sgs/pphsg/home.htm">http://iucn.org/themes/ssc/sgs/pphsg/home.htm</a>	NA
Training and Resource Manual	1. Educators' Workshop for Conservation of Manas Tiger Reserve – Resource Manual 2. Monitoring and Protecting Wildlife – Field Training Manual (in Assamese)	PHCP	Durrell and EcoSystems-India	NA

#### **4. Monitoring, evaluation and lessons**

The project has been monitored jointly by Durrell and ZSL-Darwin Fellow Dr Rajan Amin, with support from William Oliver, Chairman IUCN/SSC Pigs Peccaries & Hippos Specialist Group. The situation in Assam especially around the MTR remains precarious. However, despite this, we feel we have able to make sufficient progress on the project. We have received continued cooperation from with the local authorities and are confident of making slow albeit steady progress in the coming years. All project participants believe that the Darwin Initiative funding has been catalytic in providing an opportunity to undertake long overdue activities to protect the pygmy hog and other species in the lowland grasslands of Assam.

Dr. Robert Wild, Associate Director, LTS International, Edinburgh, visited Assam as a representative of Darwin Initiative in November 2008. He had come primarily to conduct a mid-term review of Assam Haathi Project, a human-elephant mitigation initiative of EcoSystems-India and Chester Zoo, However, he decided to visit PHCP project sites at Basistha and Potali to apprise himself about the activities of the project.

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

#### **6. Other comments on progress not covered elsewhere**

#### **7. Sustainability**

The pygmy hog conservation programme is one of Durrell's flagship projects. To ensure continuity of Darwin activities into the future, Durrell, along with ZSL and EcoSystems-India, is actively seeking further financial support. A project proposal submitted to the Critical Ecosystems Partnerships Fund was approved for grant in October 2008. Further, ZSL has expressed interest in supporting the project beyond the lifetime of their Darwin involvement. Durrell is not proposing any exit strategy for the project, but it is looking at empowering local expertise to continue the activities started by the Darwin project.

#### **8. Dissemination**

Dissemination of results to date has been limited to distribution of reports to partners and associated organisations, and government departments.

## 9. Project Expenditure

**Table 2 Project expenditure during the reporting period  
(Defra Financial Year 01 April to 31 March)**

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure*	Balance
Rent, rates, heating, overheads etc			
Office costs (e.g. postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

\*claim up to Dec. 2008

## 10. **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 ECTF and the Darwin Secretariat to publish the content of this section*

**May 2008:** Twelve years after six wild pygmy hogs (two males and four females) were captured from their last surviving population in Manas National Park of Assam, sixteen captive bred hogs were reintroduced into the wild. Seven male and nine female hogs, belonging to three social groups, were released in Sonai Rupai Wildlife Sanctuary as the part of a proposed series of reintroduction projects in selected sites in Assam, conducted under the auspices of the Pygmy Hog Conservation Programme (PHCP) supported by Darwin Initiative. They were bred at PHCP research and breeding centre in Basistha near Guwahati before being transferred to a specially constructed 'pre-release' facility in Potasali near Nameri National Park. Under the 'soft release' procedure, these hogs were maintained in large 'pre-release' enclosures for five months and were transferred to final 'release' enclosures in Sonai Rupai and were released from these enclosures to the wild over the next two weeks. The new population of released hogs will be monitored using direct and indirect methods.

**April 2009:** Most of the pygmy hogs (*Porcula salvania*) reintroduced in Sonai Rupai appear to have survived a year after their release into the wild. Ground surveys and camera video-trapping suggest that up to two-third of the 16 pygmy hogs released in a Sonai Rupai grassland are thriving. At least one of the two pregnant females had farrowed successfully after release, and tracks of young pygmy hogs were detected in the grassland in June 2008.

To augment the reintroduced population, a second release of three social groups comprising 14 captive bred hogs (5 males, 9 females) is planned in the Sanctuary in May 2009. These hogs are being prepared for survival in the wild in simulated habitats in large enclosures at the PHCP 'pre-release' facility in Potasali, Nameri Tiger Reserve, since December 2008. They will be shifted in consecutive batches to temporary 'soft-release' enclosures in Sonai Rupai for a week in May 2009 before being allowed to go out into the wild.

## Annex 1

### Report of progress and achievements against Logical Framework for Financial Year: 2008/09

Project summary	Measurable Indicators	Progress and Achievements April 2008 - March 2009	Actions required/planned for next period
<p><b>Goal:</b> <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"> <li>• <i>the conservation of biological diversity,</i></li> <li>• <i>the sustainable use of its components, and</i></li> <li>• <i>the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></li> </ul>		<p><i>(report on any contribution towards positive impact on biodiversity or positive changes in the conditions of human communities associated with biodiversity e.g. steps towards sustainable use or equitable sharing of costs or benefits)</i></p>	<p><i>(do not fill not applicable)</i></p>
<p><i>Purpose</i> To build local capacity in Assam to have the capacity and information systems for: 1) pygmy hog conservation; and 2) meet overall CBD objectives for the area.</p>	<p>Improved information on wild pygmy hog populations, and habitat available for effective management and implementation of a forward five-year strategy.</p> <p>Regular reviews and feedback reports.</p>	<p>A new population of pygmy has been reintroduced in Sonai Rupai and is thriving.</p> <p>The system to get Park staff status reports on wildlife populations has not yet started working well due to low levels of interest and motivation in Manas staff; this is mainly due to serious lack of support facilities in the field camps and preoccupation of the staff with their existing duties.</p> <p>Results towards the larger biodiversity and sustainability goals have been partially demonstrated.</p>	<p>Monitoring of the reintroduced population and release of pygmy hogs in a second site in Assam.</p> <p>Training frontline staff at the reintroduction sites to monitor the hogs and other indicator species.</p>
<p>Outputs</p> <p>a) Comprehensive system for monitoring of pygmy hog populations, other associated grassland species and their habitats in MTR established.</p>	<p>Distribution, habitat use and relative abundance of the pygmy hog, and other grassland species in MTR extrapolated.</p> <p>Annual status reports</p>	<p>Rapid pygmy hog surveys conducted in 3 ranges of MNP to establish presence or absence of pygmy hogs. Pygmy hogs were found in all the ranges of MNP, most of them in Bansbari.</p> <p>Annual status reports prepared.</p>	<p>Continuation of extensive pygmy hog and habitat surveys covering more areas of MNP in all the three ranges.</p> <p>Land cover and habitat sensitive maps for Sonai Rupai.</p>

	<p>Habitat sensitive area maps and PHVA models produced (Y2, Y3).</p> <p>Long-term plan for pygmy hog conservation developed by Y3.</p> <p>2 MSc's trained.</p> <p>Local BSc and MSc student placement studies.</p>	<p>Land cover and habitat maps based on satellite imageries prepared.</p> <p>A 5-year conservation plan for pygmy hogs was prepared but it is being updated and finalised.</p> <p>Two MSc students trained in behavioural and satellite data based habitat studies. A post-MSc student trained in field surveys.</p> <p>Three BSc students, two of them from a local college have been selected for training and internship with the project and they will be starting in May 2009. They will be advised about possible placements.</p>	
<p>b) New pygmy hog populations established in SRWS/NNP.</p>	<p>Improved protection, monitoring and grassland habitat management in SRWS/NNP</p> <p>Captive-bred hogs from PHCPRBC in Guwahati moved to 'pre-release' holding and management enclosures, and 25 hogs released and monitored in SRWS/NNP</p>	<p>Report on habitat suitability of potential release sites within SRWS/NNP prepared.</p> <p>14 frontline staff members from SRWS/NNP/ONP trained and deployed for improved monitoring and grassland protection.</p> <p>A total of 16 hogs in 3 social groups were released in SRWS in May 2008; up to 12 of them continue to survive after 10 months.</p> <p>Three more groups comprising 14 hogs were shifted to the Potasali pre-release enclosures in December 2008. There was significant change in behaviour of the hogs as they became increasingly wild.</p>	<p>Release of 12-14 more hogs in SRWS and monitoring of released hogs.</p> <p>Advising SRWS / NNP authorities and staff for better management and protection of the grassland habitat, particularly about burning regime.</p> <p>Infrastructure development for better protection of the pygmy hog release sites.</p>

<p>c) Trained and accredited instructors for pygmy hog and other grassland species conservation, continuing training of field patrol and monitoring staff.</p>	<p>Minimum of 10 park staff trained and accredited as instructors by Y2. Minimum 30 patrol and monitoring staff trained. Training manuals and posters.</p>	<p>14 frontline staff members from SRWS/NNP/ONP trained and deployed for improved monitoring and grassland protection. 4 sets of manuals and posters (set of 12 posters) in Assamese and used for training.</p>	<p>More frontline staff in reintroduction sites trained and used for monitoring and protection.</p>
<p>d) Community education programme.</p>	<p>Minimum of 20 school teachers and relevant park staff and members of local groups and NGOs per year trained in accredited conservation and environment education (Y1-Y3).  A social, cultural and economic assessment of the MTR adjoining communities undertaken. Outputs used to inform and support local government organisations and NGOs in developing community livelihood initiatives. Outreach programme implemented.</p>	<p>45 local school teachers trained in EE methods and tools and relevant issues pertaining to grasslands and pygmy hog conservation Resource material for EE programmes distributed. Considerable progress has been achieved in working with fringe area communities of MNP. Operations of existing SHGs in 3 model villages were strengthened and new SHGs were formed to adopt alternative livelihood options in order to reduce dependence on Park's resources. The awareness and interest in conservation of pygmy hog and its grassland habitat is much higher in these villages. Measures for mitigating human-animal conflict were introduced.</p>	<p>Improved mitigation methods including solar power fencing, chilli fencing in the fringe villages of MNP/NNP. Incentives for better conservation and reduction in use of Park resources.</p>
<p>e) Publications and publicity.</p>	<p>Radio broadcasts. 2 papers submitted to peer-reviewed journals by Y3.</p>	<p>A radio broadcast and extensive publicity about pygmy hog release projects activities through print and electronic media (several TV local and national channels, Internet sites including BBC). Interviews and news items in</p>	<p>Two papers.</p>

		newspapers and TV A paper and two book chapters submitted for publication.	
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<b>Activities: Activity Milestones (summary of implementation timetable)</b>			
Field training and workshops	<p>Training of park staff in Grassland Mammal Information Management System's future support and development (Jun 08);</p> <p>Workshop: final PHVA analysis of pygmy hog and associated grassland species data gathered by MTR and SRWS/NNP staff throughout the project (Mar 09);</p> <p>Workshop to develop the long-term plan for the conservation of pygmy hogs and the grassland habitats (Mar 09).</p>	<p>None owing to absence of suitable candidates for such training as well as installation of GMIMS.</p> <p>Efforts on to make the instructor's training programme (developed by the project) a formal course at the Assam Forest School and the monitoring system to be incorporated in regular duties of frontline staff. Discussion with the Forest Dept. under progress.</p> <p>Workshops planned for next year.</p> <p>"</p>	<p>Assist with resource material and resource persons once the proposal to make the instructor's training programme a formal Course is accepted and the FD incorporates the monitoring systems in regular duties of the frontline staff..</p> <p>Workshops</p>
Field monitoring and research programme	<p>Establishment and monitoring of pygmy hog populations in SRWS/NNP;</p> <p>Third annual park status reports produced (Mar 09); Final PHVA model (Mar 09);</p>	<p>Field surveys for monitoring of reintroduced pygmy hogs at SRWS;</p> <p>Video camera traps used to track and identify marked and released hogs.</p> <p>None</p>	<p>Monitoring of released hogs and habitat at SRWS. Identification of additional release sites in Assam.</p> <p>Pygmy hog and habitat surveys in Manas.</p>

	Habitat and security assessment of new pygmy hog sites in SRWS/NNP (Mar 09); Forward management plan for pygmy hogs (Mar 09).	Habitat map of Manas NP prepared based on satellite imagery. Thesis on behavioural profile of pygmy hog, specially change in their behaviour from captivity to wild. Thesis on spatial and temporal pattern of fire in the Manas. Pygmy hog surveys in MNP Annual report prepared for submission to DI	Improved monitoring of released pygmy hogs. Radio telemetry using implanted radio tags.
Field tools and procedures			
Publicity material and papers	Education material produced (Yr1-3); 5 publications submitted by Yr 3	Resource manual for Educators” Workshop for Conservation of Manas Tiger Reserve. Draft of booklet on grasslands and grassland animals prepared. A paper and 2 book chapters submitted for peer reviewed journal.	Press material for print and electronic media on pygmy hog release and other project activities Paper in peer reviewed journal.
Community programme	Training of at least 60 community school teachers and relevant park staff and members of local groups and NGOs in environment education.	A total of 70 local school teachers trained in EE tools, and conservation issues over the last 2 years. They are being assisted in disseminating the information to students and community members.	EE activities in local schools by trained teachers
Project management	Project monthly meetings; Annual park field assessment reports; 6 monthly and annual Darwin progress reports;	Project staff meetings held in Assam; annual meeting in Jersey. Annual and half-yearly reports submitted	Project staff meetings Assam Reports to Darwin Initiative.

	Final Darwin project report	to Darwin Initiative; project progress reports produced at regular intervals	
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## Annex 2

### Logical Framework

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Goal:</b></p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> <li>• the conservation of biological diversity,</li> <li>• the sustainable use of its components, and</li> <li>• the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<p><b>Purpose</b></p>			
To build local capacity in Assam to have the capacity and information systems for: 1) pygmy hog conservation; and 2) meet overall CBD objectives for the area.	Improved information on wild pygmy hog populations, and habitat available for effective management and implementation of a forward five-year strategy. Regular reviews and feedback reports.	Annual park staff status reports on wildlife populations. Recommendations for pygmy hog meta-population and habitat management.  At least one new pygmy hog population restored.	<i>High level support within FD and MoEF, GoA, for the aims of the pygmy hog conservation and management strategy developed by project.</i>
<p><b>Outputs</b></p>			
a) Comprehensive system for monitoring of pygmy hog populations, other associated grassland species	Distribution, habitat use and relative abundance of the pygmy hog, and other grassland species in MTR extrapolated.	Wildlife monitoring data in system database.  Papers published on	Retention of staff with specialised training skills and experience, and

<p>and their habitats in MTR established.</p>	<p>Fully working GIS database system at MTR (by Y1), SRWS/NNP (by Y2) and PHCPRBC (by Y1).</p> <p>Minimum of 8 staff trained in GIS, use of database system, data analysis and status reporting (Y1 and Y2).</p> <p>Annual status reports</p> <p>Impact of burning on pygmy hog populations and other wildlife understood, and prime habitats identified by Y2.</p> <p>Habitat sensitive area maps and PHVA models produced (Y2, Y3).</p> <p>Habitat assessment manual produced; at least 5 staff trained in habitat assessment (Y2).</p> <p>Conservation priorities for specific areas in MTR developed by Y2.</p> <p>Long-term plan for pygmy hog conservation developed by Y3.</p> <p>2 MSc's trained.</p> <p>Local BSc and MSc student placement studies.</p>	<p>relationship between distribution and abundance of species and habitat characteristics.</p> <p>Report of habitat suitability analyses for pygmy hogs produced to guide management practices.</p> <p>Number of annual status reports.</p> <p>Sensitivity maps and PHVA models produced to guide management practices.</p> <p>Habitat assessment manual and number of staff trained.</p> <p>Digital and photographic products to aid MTR resource managers.</p> <p>BSc, MSc reports and certificates.</p> <p>5-year conservation plan for pygmy hogs produced.</p>	<p>high motivation.</p> <p>Support for equipment maintenance and repairs.</p>
<p>b) New pygmy hog populations established in SRWS/NNP.</p>	<p>Suitable release sites within SRWS/NNP identified by Y1.</p> <p>Improved protection, monitoring and grassland habitat management in SRWS/NNP by Y2.</p> <p>Captive-bred hogs from PHCPRBC in Guwahati moved to 'pre-release' holding and management enclosures, and 25 hogs released and monitored in SRWS/NNP by Y2.</p>	<p>Report on habitat assessment and suitable release sites within SRWS/NNP.</p> <p>Number of SRWS/NNP staff trained in protection, monitoring and grassland management.</p> <p>Pygmy hogs released in one</p>	<p>Full collaboration from SRWS/NNP staff.</p>

		new area and status monitored over time.	
c) Trained and accredited instructors for pygmy hog and other grassland species conservation, continuing training of field patrol and monitoring staff.	<p>Minimum of 10 park staff trained and accredited as instructors by Y1.</p> <p>Minimum 30 patrol and monitoring staff trained.</p> <p>Training manuals and posters.</p>	<p>Numbers of staff trained and achievement levels summarised in training assessment reports.</p> <p>Quality of training manuals and posters</p>	<p>Trained staff retained and stimulated instructors.</p> <p>Well motivated field patrol and monitoring staff.</p>
d) Community education programme.	<p>Community education and liaison officer appointed by Y1.</p> <p>Minimum of 20 school teachers and relevant park staff and members of local groups and NGOs per year trained in accredited conservation and environment education (Y1-Y3).</p> <p>A social, cultural and economic assessment of the MTR adjoining communities undertaken. Outputs used to inform and support local government organisations and NGOs in developing community livelihood initiatives.</p> <p>Outreach programme implemented.</p>	<p>Number of school teachers and relevant park staff and members of local groups and NGOs trained.</p> <p>Community awareness and education material produced.</p> <p>Quality of assessment report, summary produced in local language for communities and local groups.</p> <p>Number of outreach activities undertaken.</p> <p>Number of livelihood initiatives started.</p>	<p>Suitable education and community liaison officer available.</p> <p>Teachers have continued interest in CEE training.</p>
e) Publications and publicity.	<p>Conservation education material produced and published in Assamese and local Bodo languages by Y1.</p> <p>Community education awareness material produced and published in Assamese and local Bodo languages by Y1.</p> <p>Radio broadcasts.</p> <p>2 papers submitted to peer-reviewed journals by Y3.</p>	<p>Copies of all publications sent to Darwin Initiative.</p>	<p>Outlets for publications and publicity willing to participate.</p>

Activities	Activity Milestones (summary of implementation timetable)	Assumptions
Field training and workshops	<p>Yr 1: Training workshop in monitoring and survey methods (2 wks Sept 06); Initial intensive on-site training of MTR park monitoring staff followed by on-going training on periodic basis by local trainers (4 wks, Oct 06); training of MTR park officers in GIS, data entry and management, data quality control, and basic data processing using Grassland Mammal Information Management System and field protocols (1 wk, Oct 06); training of MTR staff in the use of radio tracking equipment (2 days, Oct 06); training workshop of MTR and SRWS/NNP park staff in production of annual status reports (1 wk, Mar 06).</p> <p>Yr 2: Intensive on-site training of SRWS/NNP park monitoring staff followed by on-going training on periodic basis by local trainers (4 wks, Oct 06); training of SRWS/NNP park officers in GIS, data entry and management, data quality control, and basic data processing using Grassland Mammal Information Management System and field protocols (1 wk, Oct 06); training of SRWS/NNP staff in the use of radio tracking equipment (2 days, Oct 06); training workshop: park ecologists and monitoring staff trained in habitat assessment and management techniques (1 wk, Oct 07); workshop: PHVA analysis of pygmy hog and associated grassland species data gathered by MTR and SRWS/NNP staff.</p> <p>Yr 3: Training of park staff in GMIMS's future support and development (Jun 08); workshop: final PHVA analysis of pygmy hog and associated grassland species data gathered by MTR and SRWS/NNP staff throughout the project (Mar 09); workshop to develop the long-term plan for the conservation of pygmy hogs and the grassland habitats (Mar 09).</p>	High level of staff motivation.
Field monitoring and research programme	<p>Yr 1: Protocols for monitoring and habitat surveys produced and agreed Aug 06; Monitoring of pygmy hog populations and other associated grassland species started by Oct 06; 2 MSc park students start MSc field projects (Oct 06); Suitable areas within SRWS/NNP identified for establishment of pygmy hog populations by Mar 07; first annual park status reports produced (Mar 07).</p> <p>Yr 2: Establishment and monitoring of pygmy hog populations in SRWS/NNP Apr 07 onwards; Vegetation database and vegetation (Sept 07); Final report on habitat status and impact of burning, livestock grazing and harvesting (Sept 07); Distribution and abundance of pygmy hog populations known in MNP by Dec 07; MSc studies completed (Dec 07); second annual park status reports produced (Mar 08); Initial PHVA model (Mar 08).</p>	<p>Suitable sites identified within SRWS/NNP for introduction of pygmy hogs.</p> <p>Highly trained and stimulated instructors.</p> <p>Good quality monitoring and survey data collected and stored</p>

	Yr 3: third annual park status reports produced (Mar 09); Final PHVA model (Mar 09); Habitat and security assessment of new pygmy hog sites in SRWS/NNP (Mar 09); Forward management plan for pygmy hogs (Mar 09).	in database.
Field tools and procedures	Yr 1: Monitoring training and test material developed (Aug 06); GIS based Grassland Mammal Information Management System developed (Aug 06); GIS database system implemented at MTR (Oct 06), SRWS/NNP (Apr 2007); Data recording and assessment procedures produced (Sept 06); Status reporting templates developed (Mar 07); Yr 2: Habitat assessment manual and management guidelines developed (Sep 07)	None.
Publicity material and papers	2 radio broadcasts per year (Yr 2 & 3); Education material produced (Yr1-3); 5 publications submitted by Yr 3	None.
Community programme	Yr 1: Education and community liaison officer recruited (May 06); Initial set biodiversity and environmental education teaching and awareness material produced (Aug 06); Social, cultural and economic assessment report (summary in local language) and meeting with relevant groups and organisations (Dec 06); Community outreach programme initiated (Jan 07); Support in development of suitable community livelihood initiatives started (Jan 07). Yr 1-3: Training of at least 60 community school teachers and relevant park staff and members of local groups and NGOs in environment education.	Able to employ suitably qualified community education officer.  Well motivated school teachers, local groups and NGO staff.  Community support.
Project management	Yr 1: Steering committee established (May 06) Yr 1-3: Project monthly meetings; Annual park field assessment reports; 6 monthly and annual Darwin progress reports; Final Darwin project report	None.

## Supplementary material

Following Annexure are attached:

- Annex 3: A behavioural profile of captive bred pygmy hogs *Porcula salvania* prior to reintroduction into the wild. A thesis submitted in partial fulfilment for the degree of Master of Science in Wildlife Biology and Conservation, WCS Post-Graduate Programme in Wildlife Biology & Conservation Centre for Wildlife Studies and National Centre for Biological Sciences, Bangalore. Robin Kurian Abraham (2008).
- Annex 4: Identifying Spatial and Temporal pattern of fire in the Manas National Park, India: Implications for grassland habitat conservation. A thesis submitted in partial fulfilment of the requirement for the degree of Master of Science and the Diploma of Imperial College, London. Chihiro Takahata (2008).
- Annex 5: Patterns of active fires in the Manas National Park, India: An 8-year study. A report. Chihiro Takahata, Raj Amin, Gitanjali Banerjee, Pranjit Sarma and John E. Fa (2008).
- Annex 6: Photographs (not in other Annexure) – Meetings, teachers training, community outreach, pre-release facility, release sites in Sonai Rupai

### Checklist for submission

	Check
Is the report less than 5MB? If so, please email to <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> putting the project number in the Subject line.	Yes
Is your report more than 5MB? If so, please advise <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> that the report will be send by post on CD, putting the project number in the Subject line.	
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you completed the Project Expenditure table?	
Do not include claim forms or communications for DEFRA with this report.	