Darwin Initiative – Final Report

*(To be completed with reference to the Reporting Guidance Notes for Project Leaders (http://darwin.defra.gov.uk/resources/) it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)*

Darwin project information

Project Reference	18-008
Project Title	Trans-boundary solutions to the Asian vulture crisis
Host country(ies)	India and Nepal
Contract Holder Institution	Royal Society for the Protection of Birds (RSPB)
Partner Institution(s)	Bombay Natural History Society (BNHS), Bird Conservation Nepal (BCN), The National Trust for Nature Conservation (NTNC), Department of National Parks and Wildlife Conservation (DNPWC), International Centre for Birds of Prey (ICBP), Zoological Society of London (ZSL)
Darwin Grant Value	£299,960
Start/End dates of Project	01/04/2010 to 30/03/2014
Project Leader Name	Dr Toby H. Galligan
Project Website	www.vulturerescue.org and www.save-vultures.org
Report Author(s) and date	Toby H. Galligan (RSPB), Vibhu Prakash (BNHS) and Khadananda Paudel (BCN) 10/02/2014

1 Project Rationale

The collapse in South Asia's vulture populations, due to poisoning by the veterinary drug diclofenac, has received worldwide publicity. During the 1990s and 2000s, South Asia's three resident *Gyps* species – the Oriental white-backed vulture *Gyps bengalensis*, long-billed vulture *Gyps indicus* and slender-billed vulture *Gyps tenuirostris* – declined by more than 97% and were uplisted to Critically Endangered. The cause of these declines was diclofenac, which is toxic to vultures, causing death via renal failure within days of exposure. Diclofenac, a wonder drug for common ailments in livestock, was used in millions of courses throughout South Asia during the vulture declines. Vast numbers of livestock are farmed for milk and used for labour, but not farmed for meat in South Asia (i.e., cattle, buffalo, horses, camels); instead, most livestock carcasses are left for scavengers to consume. Vultures are exposed to diclofenac in livestock that have died before their bodies have had the chance to metabolise diclofenac. Being obligate scavengers, vultures are highly adapted to finding and consuming carrion, historically

providing an essential ecosystem service for South Asian societies, which has been lost in the wake of the vulture declines.

Previous work, funded by the Darwin Initiative (projects 162/12/027 Prediction and management of declines in *Gyps* species vultures; and EIDPO005 Conservation actions to secure the recovery of *Gyps* species vultures), established Vulture Rescue Centres cum Vulture Conservation Breeding Centres (VCBC) in India and Nepal, identified diclofenac as the cause of the declines, identified meloxicam as a safe alternative drug to diclofenac and brought about a central government ban on diclofenac manufacture, distribution, sale and use in India, Pakistan and Nepal. However, our monitoring of diclofenac prevalence in livestock carcasses and of vulture populations showed that South Asia's *Gyps* vultures were still on a course to extinction, calling for a comprehensive programme of *in-situ* and *ex-situ* conservation action. Three complimentary tasks are central to the successful recovery of vultures: 1) consolidating VCBCs and building staff capacity; 2) increasing the effectiveness of the diclofenac ban through education, advocacy and continued monitoring of diclofenac prevalence; and 3) focussed conservation action around remaining breeding colonies. Because of increasingly strong relations between Indian and Nepali partners in vulture conservation, the flow of veterinary products across borders, and the fact that vultures range over hundreds of kilometres and national borders, this Darwin Initiative project focussed on trans-boundary efforts to save these species.

Our aims for consolidating VCBCs and building staff capacity were: developing the centre in Nepal (specifically, constructing in a second colony/breeding aviary, chick aviaries, an education room and improved water and power supply); stabilising partner stakes in the centres in Nepal and West Bengal (specifically, providing wages for centre staff and half of the feeding costs in the Nepal centre); training for staff at all centres (specifically, husbandry and veterinary training); and trialling alternative food supplies at all centres (specifically, goat/rabbit farming and train-killed wild ungulates).

Our aims for increasing the effectiveness of the diclofenac ban through education, advocacy and continued monitoring of diclofenac prevalence and for focussed conservation action around remaining breeding colonies evolved into establishing Vulture Safe Zones (VSZs)of zero diclofenac-tolerance around remaining breeding colonies. *In-situ* vulture conservation in Nepal, supported by a previous Darwin Initiative project (EIDPO005 Conservation actions to secure the recovery of *Gyps* species vultures), showed that a multi-faceted approach of the provision of diclofenac free carcasses at vulture "restaurants" and an advocacy, education and drug-swapping campaign to replace diclofenac with meloxicam around the feeding sites increased vulture numbers in nearby nesting colonies. The term VSZ was first used to refer to these combined activities. However, we realised that the Nepali VSZ need to be larger to reflect the ranging behaviour of vultures. In addition, the idea need to be replicated throughout South Asia, include trans-boundary zones because vultures frequently moved across political borders and would require the help of a network of concerned individuals. Therefore, our aims for *in situ* conservation were: expand the VSZ in Nepal; establish and building capacity in VSZ at strategic sites in India; develop best-practice advocacy and education strategies for conservationists in VSZs; and develop a monitoring programme for vultures and veterinary drugs within VSZs.

Our *ex-situ* and *in-situ* aims are complementary – captive-bred vultures will supplement wild populations; and VSZ will provide safe sites for their releases – and the

proposed expansion of the VSZ programme offers a practical means of delivering sufficient areas free from diclofenac contamination for vulture recovery.

Our vulture conservation work takes place in three Vulture Conservation Centres in India – Haryana, Assam and West Bengal – and one in Nepal; as well as six VSZs in India – Assam, Gujarat (Central), Gujarat (Saurashtra), Jharkhand, Uttarakhand and Uttar Pradesh – and one in Nepal (lowlands; Figure 1).

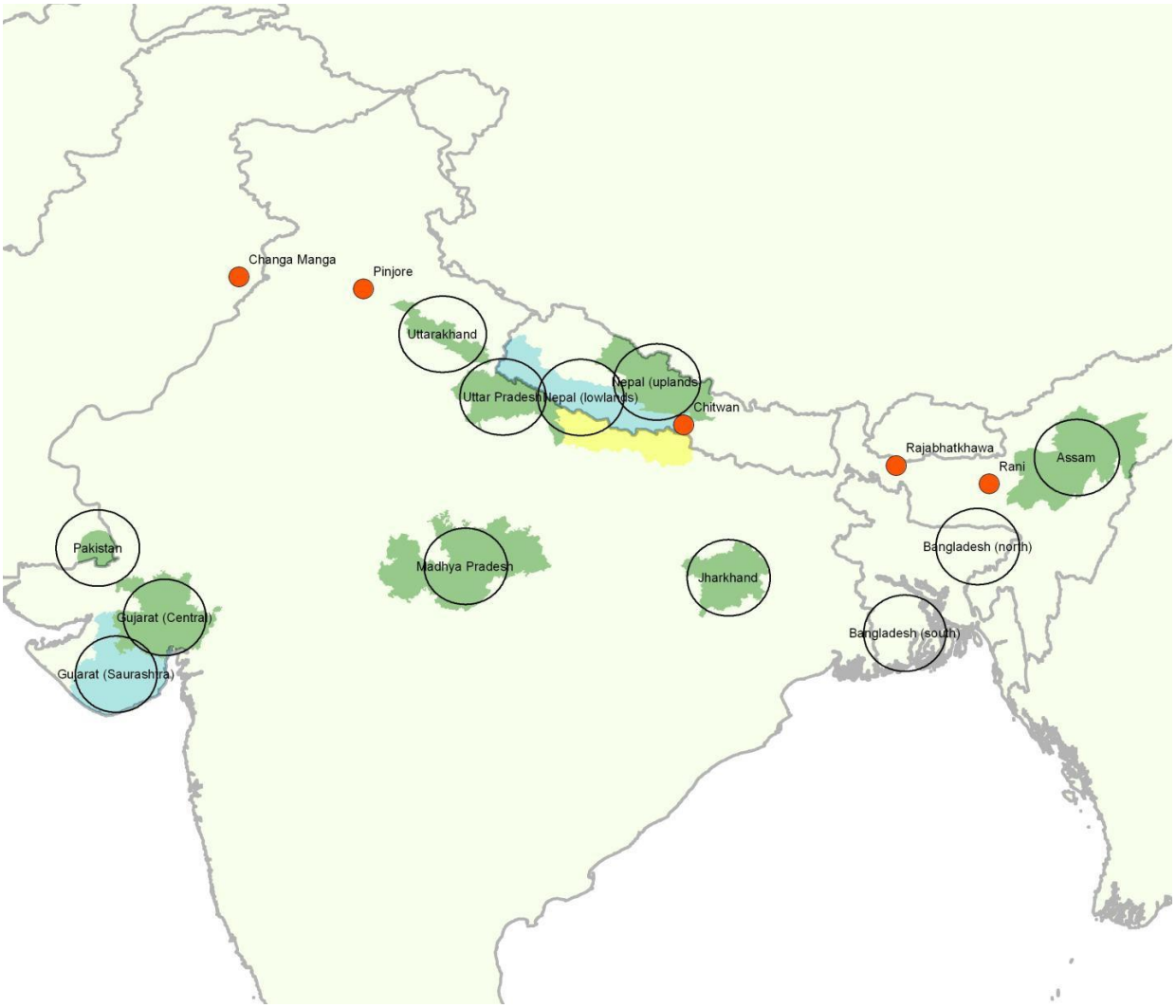

Figure 1: Map of vulture conservation activities in South Asia. Red-filled circles indicate four Vulture Conservation Breeding Centres (VCBCs) funded by this project in India and Nepal (left to right: Pinjore, Haryana; Chitwan, Nepal; Rajabhatkhawa, West Bengal; and Rani, Assam); and one VCBC not funded by the project in Pakistan. Also shown are seven provisional Vulture Safe Zones (pVSZs) funded by this project in India and Nepal (left to right: Gujarat (Saurashtra); Gujarat (Central); Uttarakhand; Uttar Pradesh; Nepal (lowlands); Jharkhand; and Assam); and six pVSZs not funded by this project (left to right: Pakistan; Madhya Pradesh; Nepal (uplands); Uttar Pradesh extension (in yellow); Bangladesh (south); and Bangladesh (north)). Black-unfilled circles indicate an area 100km in radius. Coloured shapes indicate the area of work within pVSZ. The boundaries of coloured shapes follow district boundaries. Different coloured shapes are used to distinguish adjacent pVSZs only. No coloured shapes are present in Bangladesh because work is yet to begin there.

2 Project Achievements

2.1 Purpose/Outcome

Purpose: To improve trans-boundary collaboration and capacity in Nepal and India to implement effective conservation solutions for Asia's Critically Endangered vulture species

Measurable indicators to reach the project's purpose were: 1) an increase in the number and area of VSZs in Nepal and India; 2) an increase in staff capacity at VCBCs and VSZs to sustain conservation activities; and 3) an expansion of the Vulture Conservation Breeding Programmes in India and Nepal. Our project achievements have met these indicators. Specifically, we have established one provisional VSZ in Nepal, encompassing 30 districts and more than 30,000km^2 of area; and we have developed six provisional VSZs in India, encompassing 29 districts and close to 30,000km^2 of area when combined. The VSZ idea has been adopted as the *in-situ* approach to vulture conservation by the recently formed SAVE (Saving Asia's Vultures from Extinction) consortium and Regional Governmental Steering Committee for Vulture Conservation. The project has employed and trained more than 30 individuals in a diversity of roles and skills, including: breeding centre keepers trained in artificial incubation and brooding; breeding centre veterinarians trained in vulture specific veterinary care; VSZ teams trained in the best strategies for advocacy and education; and VSZ coordinators trained in experimental design and data collection and analysis. The maintenance of four fully operation VCBCs with stable or increasing captive vulture populations and seven provisional VSZs many with decreasing diclofenac prevalence are proof that this capacity building has been successful. Indian and Nepal project leaders and staff have come together to share knowledge, skills and experiences at workshops and meetings, including the annual SAVE meetings held in 2011-2013. Finally, the project constructed aviaries, buildings and infrastructure at two breeding centres, expanding the breeding programme to four fully operational breeding centres. All centres are well stocked with wild-caught vultures from the three Critically Endangered species. Successful natural and artificial breeding is occurring at the two most established centres. The 2013/2014 season is the first to have successful natural breeding attempts at all four centres. We are confident that both VSZs and VCBCs in India and Nepal, managed by the collaboration of the project's partners, will continue to improve and contribute to the conservation of vultures in South Asia.

2.2 Goal/ Impact: achievement of positive impact on biodiversity and poverty alleviation

Goal: The establishment of self-sustaining wild vulture populations in South Asia in an environment free from diclofenac and other harmful toxins

The projects sub-goals were to: 1) increase wild and captive vulture populations in South Asia; 2) decrease diclofenac and other vulture-toxic veterinary drugs in vulture food; and 3) improve the IUCN threat status of Critically Endangered *Gyps* vultures. We were unable to achieve the latter of these three sub-goals, but this and previous Darwin Initiative projects have impacted positively on the first two sub-goals. More specifically, diclofenac prevalence in livestock carcasses in India (our gold standard measure of prevalence) has fallen from 11% in 2006 to 4% in 2009/10; and meloxicam prevalence has risen from 4% in 2006 to 8% in 2009/2010; and although another 9 types of NSAID are used in India the combined prevalence of these was only 1% in 2009/10. In addition, all 8 wild populations of vulture (7 species) that we monitor in Indian and Nepal have shown a stabilisation in

their declines and 4 of these populations have possibly begun to recover. Further, our captive populations have increased through successful natural and artificial breeding: 20 young in 2010/11; 26 young in 2011/12; and 26 young in 2012/2013. The 2013/2014 breeding season continues, but we expect at least as many young reared as in the previous years. Later in 2014, we will analyse the fifth carcass survey and undertake the seventh vulture survey – we expect trends for NSAID prevalence and vulture populations will continue positively.

This project also contributed to human development and welfare in India and Nepal by employing more than 30 individuals at breeding centres, feeding sites and in VSZ teams. Further, at six Vulture Safe Feeding Sites in Nepal we have improved the livelihoods of whole communities. However, the greatest impact our project will have is returning the important ecosystem services provided by vultures (i.e., efficiently disposing of livestock carcasses, reducing the number of feral dogs and preventing the spread of livestock and human disease) to billions of Indian and Nepali people and thereby improving human development and welfare.

2.3 Outputs

Output 1. Expansion of *in-situ* vulture conservation projects across Nepal and in neighbouring areas of India.

The first VSZ in Nawalparasi, Nepal was a small site where the local community engage in vulture conservation by agreeing to not use diclofenac to treat their livestock, encouraging neighbouring communities to do the same, and providing diclofenac-free livestock carcases to vultures at a feeding site known as Vulture or Jatayu Restaurant. Pre-project, we envisaged replicating this idea at more than four sites in Nepal and at least one site in northern India, near the Nepali sites. However, post-project, we have established one adequate-sized provisional VSZ spanning 30 districts and more than 30,000 km^2 in the western lowlands of Nepal; and initiated six provisional VSZs in western, eastern and northern India, including sites that border the Nepali zone. Collectively, the Indian zones span as many districts and geographical area as the Nepali zone.

In Nepal, BCN and the RSPB, with support from the Department of National Parks and Wildlife Conservation, expanded the original VSZ to encompass the whole district of Nawalparasi and then, district by district, we expanded this zone westward through the lowland region to Kanchanpur and Dadelhura in the far west. We did so by encouraging district officials to acknowledge the plight of vultures and the ban on diclofenac, and then publically declare their district to be diclofenac-free. "Diclofenac-free" was an objective and pledge to which everyone in the district would work towards, rather than a reality (it is for this reason that we now call the Nepali and Indian zones "provisional" – only when diclofenac has been completely removed from a zone will it be declared a true VSZ). Certainly, pharmacy surveys revealed diclofenac was still available to purchase in most districts. The declaration process provided an opportunity to engage decision makers and large numbers of the public through public meetings and media coverage. Following the declaration, the drug control authority accompanied us on pharmacy surveys, confiscating illegal stocks of diclofenac and issuing warnings to offending pharmacists. We publically destroyed confiscated diclofenac jointly with district officials, authorities in the presence of local and national media. We engaged untrained veterinarians – the biggest users of

diclofenac and the hardest to engage because they work illegally – through diclofenac-for-meloxicam swaps (we swapped approximately 1000 vials). In addition, we undertook a thorough programme of awareness raising among local communities within each district. We asked local communities to actively engage in vulture conservation by selecting meloxicam over diclofenac and by protecting individual vultures and their nest sites. We built a network of local non-government organisations throughout the zone to continue vulture conservation activities in our absence. Currently, 19 community and non governmental groups continue to monitor and raise awareness of vultures in their patch across the VSZ

Five groups have established their own Vulture Safe Feeding Sites (what we now call vulture restaurants to emphasise that food shortages are not the problem, rather diclofenac-contaminated food is). Each Vulture Safe Feeding Sites has an associated Cattle Care Centre, where old, ill and injured cattle from the area are brought to be cared for without the use of medicines until their deaths (it is illegal to kill cattle in Nepal and many parts of India). It is these animals that we provide to the vultures; so we can be assured that they are diclofenac-free (diclofenac takes up to seven days to metabolise; therefore only animals cared for at the centre for more than 10 days are provided to vultures). The groups running these feeding sites benefit from sale of hides to the leather industry (two sites each generated £310 last year and three sites each generated £930 last year), bones to the fertiliser industry (five sites each generated an average of £620 last year), and wages associated with herding animals (one persons were employed at all sites last year). However, some of the money raised is used to care for the cattle and maintain infrastructure. Therefore, we have worked with these groups to generate income from cottage industries (e.g. beekeeping – two sites each generated an average of £930 last year from honey and bee's wax candle sales), village industries (e.g. dairies – one site generated £14,880 last year in milk sales) and tourism (e.g. vulture feeding experiences - two sites each generated an average of £1,860 last year in ticket sales). Further, we trained and assisted the vulture conservation network to seek funding for the activities from government schemes and small conservation grants. One group associated with a feeding site has successfully obtained £6,200 from local government to continue operations; while another has established a trust fund with WWF to continue operations indefinitely from bank interest alone. Currently, three feeding sites are self-sustaining and the other two are almost self-sustaining. We continue to work with these sites to achieve sustainability for feeding sites.

In India, we initially aimed to establish a VSZ bordering the VSZ in Nepal. We engaged three local conservation organisations that worked in close to the Nepali zone – the Mahseer Conservancy in Nainital, Uttarakhand; and Terai Nature and the Katerniaghat Foundation in Kheri and Bahraich, Uttar Pradesh, respectively. However, we also found other capable and enthusiastic local conservations living with and working for vultures further from the Nepali zone – the Neo Human Foundation in Hazaribagh, Jharkhand; and Kartik Shastri and Ruchi Dave in Ahmedabad and Bavnagar, Gujarat, respectively. Therefore, we engaged these people and established additional VSZs in there patches. Further, we established a model Indian-flavoured zone run by BNHS in Assam encompassing the VCBC there. Thus, we decided to start six (one for each state mentioned above) provisional VSZs in India. Each was strategic: the Uttarakhand and Uttar Pradesh zones would eventually link-up with the zone in Nepal to make a trans-boundary zone

>60,000 km^2 in area; the Gujarat and Jharkhand zones would be the first to protect long-billed vultures; and the Assam zone would be the first to protect slender-billed vultures. Further, given the size of India, multiple sites made sense.

We appointed two VSZ Coordinators (one BNHS and one RSPB) to work with the VSZ teams *in situ* and during advocacy and awareness-raising strategy workshops. To further assist teams, we compiled an advocacy and awareness-raising pack with published articles, fact sheets for different audiences and campaign material like posters, brochures and stickers. We asked teams to meet with all target groups (i.e. decision makers, law enforcers, wildlife protectors, drug controllers, livestock associations, veterinary associations, pharmacists, untrained veterinarians and livestock owners) in 1-6 districts surrounding their local vulture colonies. For each target group, our teams followed a tailored strategy to achieve engagement. For example, teams would request drug controllers to enforcement diclofenac-bans; provide talks at veterinary association meetings and ask attendees to pledge not to use diclofenac; and talk face to face to pharmacists about the plight vultures and the potential consequences of selling diclofenac for veterinary purposes. Arguably our greatest success in India was removing all diclofenac (animal and human formulations) in Hazaribagh, which our Jharkhand team achieved by requesting the District Magistrate to request the District Drug Controller to ask pharmacists to account for all sales of diclofenac, whom in turn found it easier to not stock the drug altogether. Further, this approach has had similar success in Bahraich, Uttar Pradesh. Teams were also involved in monitoring vultures and pharmacies in their patch. We provided training and equipment need to carry out this work. We are continuing to work within four of the six zones that we seeded during the project (Assam, Gujarat and Uttar Pradesh).

Output 2. Effectiveness of *in-situ* conservation actions tested across Nepal and India

To measure the effectiveness of our *in-situ* conservation actions we monitoring vulture populations, NSAID availability in pharmacies and NSAID use in carcasses.

We had established a monitoring programme for vultures and diclofenac prevalence on a nationwide scale in India in past Darwin Initiative projects. Every three or four years, in the northern half of the country, vultures are counted along 1000s of kilometres of road transect and livestock carcasses are sampled for NSAIDs (i.e., diclofenac, meloxicam and related drugs) at various carcass dumping sites. Since the 2006 ban on diclofenac and throughout this project, we have recorded a gradual, but continual, decrease in diclofenac prevalence and increase in meloxicam prevalence. During this project, we have also seen the first signs of recovery in vulture populations: specifically, the Oriental white-backed, red-headed and Egyptian vultures show possible increases in number; and the long-billed and slender-billed vultures show a slowing in decline. National level advocacy and awareness raising by RSPB and BNHS, supported by past, but not this present, Darwin Initiative project, have largely resulted in these positive changes in India. However, as all of our Indian provisional VSZs fall within the monitoring region and were focus points for vulture conservation, the effect of the VSZ approach and this Darwin Initiative's project contributed to these positive trends.

In Nepal and India, we have counted vultures at nesting and roosting sites within provisional VSZs. Vultures are expected to recover slowly; therefore, we do not expect to see clear recoveries within the life of this project. In Nepal, we have regularly counted

vultures along the east-west highway stretching approximately 1000 km through the lowlands – half of which is provisional VSZ – and we have seen a continual increase in vultures within the zone compared to outside the zone (in fact, outside the zone vultures are rarely encountered). Further, this data suggests that the Oriental white-backed vulture population in Nepal or, more precisely, the provisional VSZ in Nepal, is likely to be recovering. We are currently preparing a journal article to present the above findings for the Nepal zone. Post-project, we have established parallel roads transect in Uttar Pradesh running east-west, covering provisional VSZ and control area, to complement the road transect in Nepal.

We have also established livestock carcass monitoring in Nepal. We were not able to simply scale down our Indian national livestock carcass monitoring to fit provisional VSZs in India or Nepal because the large municipal carcass dumps sampled in the former did not exist in the latter, rather livestock carcasses were dumped more or less randomly throughout each zone. Coupled with the fact that we need large numbers of fresh carcasses to sample, this meant we had to adapt our sampling method. We trialled using a network of skinners (people who removed livestock hides for the leather industry) to collect samples in Nepal with success. We established that greater than 800 samples collected widely throughout the zone within two years had to be negative for diclofenac for it to be declared a true VSZ. Despite some initial setbacks, we now maintain a network of more than 30 skinners throughout the Nepali zone and we have collected greater than 800 samples in three years. We are continuing to sample in 2014, with the aim to have at least 800 samples in two consecutive years, for which we are on target for (we collected 500 samples in 2013 alone). These samples will be analysed in 2014/2015; the results of which will be published in 2015/2016. Before the end of project, we had begun establishing skinner networks within each of the Indian zones and aim to continue this work into the future.

Another method that we trialled were field diclofenac detection kits, dubbed "dipsticks". We had hoped that dipsticks would provide a quick and easy method of determining whether carcasses were contaminated with diclofenac, unfortunately these were actually quite involved and required field staff to have had considerable laboratory experience (i.e., not uneducated skinners). In addition, dipsticks were expensive, could only detect diclofenac and, being a custom-developed, had a number of problems realised during trialling that proved difficult to resolve. Thus, we decided not to pursue dipsticks further.

In lieu of carcass monitoring, we have used pharmacy surveys within zones to obtain data on the prevalence of diclofenac, meloxicam and other NSAIDs. We did this in two ways: open surveys to determine the range of NSAIDs available; and undercover to determine the common NSAIDs sold. Previous surveys with drug authorities had shown that diclofenac was now rare in veterinary pharmacies in the provisional VSZ in Nepal – in fact, no diclofenac had been found during these surveys for two years. Thus, during the project we conducted only undercover surveys (the undercover surveyor would ask for a painkiller for his sick cow and buy the first drug offered). In 2012, we found that pharmacists offered diclofenac in 5.0% of settlements surveyed (n=40); and in 2013, when both human and veterinary pharmacies were surveyed, diclofenac was offered in 7.5% of settlements surveyed (n=40). Notably, the settlements where diclofenac was available were close to the border with India and were manufactured by Indian companies. We are

uncertain whether these findings reflect a developing or overlooked problem. Either way, we have focussed advocacy efforts (including engaging customs officials) in these border areas. We are currently preparing to publish these findings.

In India, we conducted a three-stage, Before-After-Intervention-Control pharmacy survey. Stages 1 (in late 2012) and 3 (in late 2013) were conducted undercover to obtain before and after data. At Stage 2 (in early 2013), half of the pharmacists were surveyed openly and asked to engage in vulture conservation (intervention); while the other half were not surveyed at all (control). The overall aim was to determine pharmacist's willingness to engage. Our findings were mixed: in some zones we found statistically significant decreases in the number of times diclofenac was offered between Stage 1 and 3, but not in others. Similarly, we saw statistically significant increases in the number of times meloxicam was offered between Stages 1 and 3, but not in others. Based on Stage 2 data, diclofenac is still disturbingly common. We are currently preparing these data for publication. We aim to continual undercover surveys in Indian zones annually.

Output 3. Infrastructure for the Vulture Conservation Breeding Centre in Nepal and West Bengal is increased in capacity

Conservation breeding programme of *Gyps* vultures is an important safety-net for these species and a point of focus for our overall conservation programme. Support from previous Darwin Initiative projects have helped to establish VCBCs at Pinjore, Haryana, and Rani, Assam. This project aimed to build capacity at another two VCBCs: one in the Buxa Tiger Reserve, West Bengal; and other in the Royal Chitwan National Park, Nepal (the first for Nepal). Both sites are located in areas prone to political unrest and, despite previously obtaining permission to build centres; we had to maintain the support of the government agencies responsible for both sites to achieve our aims. In addition, we had to contend with expected shortages and price-increases in building materials and labour. However, we achieved our aims of this project to build a second colony aviary, chick aviaries, veterinary facility and visitor/education facilities in Nepal; and a visitor/education facility in West Bengal. In addition, we improved the water and electricity supply at the Nepal centre with bores, tanks, pumps and backup generators. The Nepal and West Bengal centres now have all the buildings and infrastructure to be fully functional. Currently, we are fitting out the visitor/education centres and laboratory with necessary equipment.

Output 4. Breeding Centre staff supported at Nepalese and West Bengal centres for three-year term of project

In addition to constructing buildings and infrastructure at the Nepal and West Bengal breeding centres, we need to develop staff capacity. We employed nine staff at the Nepal centre and six staff at the West Bengal in the first year of the project and, despite some staff turnover over the project period, we have maintained these numbers. Staff employed included centre managers, centre veterinarians and keepers. This project also helped to employ one BNHS and one BCN VSZ coordinator, two advocacy officers and two field biologists, as well as two staff in three provisional Vultures Safe Zones. VCBC and VSZ staff have been maintained to date through funds provided by SOS: Save Our Species and RSPB cofounding.

Output 5. Training and capacity of staff in India and Nepal increased with further cooperation between the two country's programmes

We identified four broad areas of required training: 1) artificial incubation and brooding for breeding centre staff; 2) husbandry and veterinary care for breeding centre staff; 3) advocacy strategies, monitoring and reporting for VSZ teams; and 4) experimental design, data analysis and manuscript writing for VSZ coordinators. We aimed to achieve this through workshops, placements and one-on-one training, either in India, Nepal or the UK.

In the first year of this project a staff member from the Pinjore breeding centre travelled to the ICBP to receive one week of training in artificial incubation and brooding techniques. We had planned for another staff member from the Assam centre to also attend but he was unable to travel in the end.

Our partners ICBP and ZSL provided additional in-country training using their own funds. In the second and third year of the project, staff from the ICBP travelled to both Pinjore and Assam breeding centres to help set-up artificial incubation and breeding facilities at these centres and provide further training and problem solving. In the second year of project, the curator from the ICBP worked with curators from the Pinjore and Assam breeding centres for approximately one month to train new staff at the West Bengal centres in vulture husbandry. Similarly, the ICBP curator spent one month training new staff at the Nepal centre in vulture husbandry. Across the second and third years, a veterinarian from ZSL floated among all four breeding centres during a period of six months providing specialised veterinary training to centre veterinarians and basic veterinary training to keepers. A curator from ZSL commenced regular visits (two week) to train and problem-solve at all breeding centres in the third year. The ICBP and ZSL are committed to continue regular visits to India and Nepal, post project.

In the second year of the project, we held our first VSZ strategy workshop over four days. Experts from RSPB, BNHS and BCN presented best-practice methods for advocacy and monitoring within VSZs and facilitate discussions among attendees to tailor these strategies to specific zones. Two members from each of the seven Indian VSZ teams and one representative from another three conservation organisations concerned about vultures attended. A second VSZ strategy workshop was held in the third year of the project to share successes and problem-solve for challenges. Between workshops and since the last workshop, the RSPB VSZ Coordinator, BNHS VSZ Coordinator and RSPB Conservation Scientist have visited each VSZ team multiple times to provide one-on-one tailored training and problem-solving. Combined, the three of us have spent approximately six months over a three year period working alongside teams in their zones. In addition, we maintained email and phone contact with teams throughout the project. Post-project, we have decided to focus, with a greater BNHS presence, on three of the Indian provisional VSZs that we established in this project (i.e., Assam, Gujarat and Uttar Pradesh). With the support of another SOS, we are building capacity in teams to continue advocacy and monitoring in each zone.

Throughout the project the RSPB has provide training to BNHS and BCN responsible for coordinating advocacy and monitoring activities. This training was designed to convey best-practice in advocacy learnt from other campaigns; as well as experimental design, field methods, data analysis and preparation of reports involved in monitoring. We largely achieved through regular one-on-one training sessions in India and Nepal and remote support (emails and phone calls). However, in the third year, taking

advantage of another grant that paid for his flights and subsistence, the RSPB hosted the BCN project leader in the UK for one month, during which time he advanced his skills in data analysis and manuscript writing.

Output 6. Trials of alternative food sources for captive vultures undertaken and feasibility of large-scale production assessed

To combat rising feeding costs associated with increasing captive populations of vultures, we aimed to trial alternative food sources. Pre-project, we predominately fed captive vultures with goats in India and with buffalo in Nepal; both which are also farmed for human consumption and thereby expensive to buy. Unfortunately, South Asian cultures a resistant to rearing and slaughtering non-traditional animals, like rabbits, cavy and rats, which hampered our progress towards this output. We had aimed to support communities near to our breeding centres to purchase, keep and slaughter small mammals. We costed rabbit farming and purchased and prepared land for this activity near the Pinjore centre. However, difficultly gaining government permission to farm rabbits, a lack of interest in the local communities to be involved and the lower priority given to this initiative (in respective to increasing captive vulture breeding success) prevented it getting off the ground. However, we did have some success in finding alternative food for the West Bengal centre by gaining permission to use the carcasses of large wild ungulates killed by trains and trucks near the centre. We purchased a walk-in freezer to accommodate these often large supplies of vulture food.

3 Project support to the Conventions (CBD, CMS and/or CITES)

This project contributes to the Convention on Biological Diversity obligations of India and Nepal. In their fourth (and latest) reports to the convention (published in 2009), both countries highlight vultures as species requiring immediate conservation and acknowledge the importance role played by our series of Darwin Initiative projects.

Specifically, Nepal list vultures under their Goal 2 and Target 2.1 – that is, "Restore, maintain, or reduce the decline of population of species of selected taxonomic group, there are two national targets: (i) Decline of selected big cat (viz. tiger, snow leopard), and birds of prey (vulture) reduced..." and "enhance vulture conservation through [*in-situ*] conservation and captive breeding". Vulture conservation is a case study given one of four text boxes in the report from Nepal.

A VCBC has been established in Nepal. Two species of vultures, Gyps bengalensis (White-rumped vulture) and Gyps tenuirostris (Slender-billed vulture), once common in Nepal, are at sharp decline. Awareness campaign has been initiated in west Nepal. A Jatayu Restaurant has been established in Nawalparasi district of Nepal under the implementation of Bird Conservation Nepal (BCN). Pesticide-free carcass is fed to the vultures in collaboration with local communities. The number has sharply increased from 21 individuals in 2004/2005 to 272 individuals in late 2008, although the population was found only 17 in 2005/2006. Currently, BCN in collaboration with NTNC, RSPB and ZSL, has drafted the Vulture Conservation Action Plan and is in the process of endorsement by the government.

India reports that the Government of India has initiated "*Project Vulture* for the recovery of these threatened species", "national programmes have been launched for 15

select critically endangered species such as... vultures", "Various measures are being taken to address the declining population of vultures in India" and "The GOI [Government of India] has formulated an action plan for vulture conservation which is being implemented in collaboration with the State/Union Territory and civil society organizations".

4 Project Partnerships

The project involved six partners: the Bombay Natural History Society (BNHS) as host country partner in India; Bird Conservation Nepal (BCN) as host country partner in Nepal; National Trust for Nature Conservation (NTNC) and the Department of National Parks and Wildlife Conservation (DNPWC) as Nepal breeding centre partners; and the International Centre for Birds of Prey (ICBP) and Zoological Society of London (ZSL) as UK breeding centre partners. In addition, we collaborated with the India Veterinary Research Institute (IVRI) and Environmental Research Institute (ERI) to process and analyse tissue samples for NSIAD prevalence; and 26 local NGOs through the VSZ initiative. During the project we maintained a good and close partnership with all the above organisations through frequent remote communication and face-to-face meetings, including three annual SAVE meetings (project partners) and two VSZ strategy meetings (VSZ teams).

We have worked with some partners to conserve South Asian vultures since 1999. We have worked with all since 2007. The project would not have been possible without the local knowledge, skills and expertise of BNHS and BCN; and through this project we were able to build these attributes further for each organisation. With respect to *in-situ* conservation, we helped BCN to improve their VSZ idea, expand it in Nepal and then replicate it with BNHS in India. Together we have realised the scale, effort and strategies required to conserve vultures in the wild. By the end of the project, we had established clear plan for how a provisional VSZ should progress towards being declared a true VSZ. With respect to *ex-situ* conservation, the ICBP and ZSL provided their expertise in vulture husbandry and veterinary care to develop capacity in BNHS, BCN and NTNC staff. By the end of the project, the breeding centres gained the know-how to be largely self-sufficient; however, the ICBP and ZSL have agreed to continue to provide support to the Indian and Nepal breeding centres in the future. NTNC and DNPWC support for the development of the Nepal breeding centre was essential; and both organisations have agreed to continue their support in the future. Therefore, all the partnerships maintained in this project are continuing post-project.

5 Contribution to Darwin Initiative Programme Outputs

5.1 Technical and Scientific achievements and co-operation

All technical and scientific achievements in this project stem from collaboration between all project partners. During this project we, the project partners, have published 15 peer-reviewed articles in regional and international scientific journals. In addition, we have collaborated on another two articles "in press", two articles "in review" and three articles "in (late stages of) preparation". Further, we have published a handbook on vulture husbandry and a report. Some of these documents stem from work funded by the previous Darwin Initiative project and some from work not directly funded by the Darwin Initiative; however, they have been produced to facilitate the goals, purpose and outcomes of the

present project. These documents have kept the plight of vultures on the "front page", supported our advocacy work and engaged others.

At the start of the project, we published the population trends for vultures in the lowlands and mountains of Nepal for the first time; revealing predicted declines between the early to mid 2000s. Half-way through the project, we published results from our 2011 road transect survey of vultures in India; showing stabilisation and possible reversal of declines for *Gyps* vultures (our first good story). By the end of the project, we had found the same positive trends in the other five populations of vultures we monitor in Indian and Nepal, including those within the Nepal provisional VSZ. We discovered that another *Gyps* species and, for the first time, an eagle species were susceptible to diclofenac poisoning, which has increased the diversity of raptors at risk. We also discovered another widely available NSAID, ketoprofen, is toxic to vultures. However, surveys at the start and end of the project showed that diclofenac prevalence in livestock carcasses in India has continually decreased since the 2006 ban; meloxicam prevalence has increased; and nine other NSIAD, including ketoprofen, although present, are uncommon. Unfortunately, diclofenac use had not ended and we published findings from a pharmacy survey that showed that this was because pharmaceutical companies are supplying pharmacists with human formulations of diclofenac to sell illegally for veterinary purposes. We also reported on bad formulations of meloxicam being produced in India that caused pain in livestock and thereby jeopardised the uptake of this drug.

We produced technical papers on alternative methods for monitoring diclofenac in carcasses, molecular sexing of vultures, how veterinarians can engage in vulture conservation and a comprehensive guide for in-country vulture conservation breeding programmes. We also wrote with partners in Cambodia (an important range country for Critically Endangered Asian vultures) on the threats to vultures there (finding no evidence that NSAIDs are a threat). We have produced a paper describing the aims and progress of the breeding programme and we are producing paper describing the aims and progress of the VSZ initiative. We are also presently writing another paper describing the science behind the VSZ initiative and how conservationists and governments can work towards their own zones. These are timely, as government, non-government and industry are beginning to engage in vulture conservation. Finally, we are writing an invited paper for a special issue of the Proceeding of the Royal Society B: Biological Sciences on the impact of pharmaceutical in the environment, which will summarise our conservation actions for the past decade and the latest data on diclofenac and meloxicam prevalences.

5.2 Transfer of knowledge

This projects progress has been disseminated through the project's *Vulture Rescue* website and more recently the *SAVE* website, as well as news, blogs and podcasts available on the *RSPB*, *BNHS* and *BCN* websites. This project has featured regularly in Indian and Nepali newspapers, online articles and radio segments thanks to the dissemination of our work by BNHS, BCN and the local partners working in the VSZ. Both BNHS and BCN wrote a press release following publication of our journal article showing the slowing in decline in *Gyps* vultures, which alone led to considerable media coverage in India and Nepal, and around the world (including the UK). This project is the topic of a *Science* magazine perspectives and a chapter in Tony Juniper's book *What has nature ever done for us?* Most recently, *BBC World* has produced a documentary on the plight of *Gyps* vultures in South

Asia and the actions to conserve these species, in which our breeding centres and provisional VSZs feature.

The actions, findings and successes of this and the previous Darwin Initiative projects, have received much attention from conservations and decision makers in South Asia. Vultures have featured heavily in discussions on conservation at professional conferences and government meetings for the past decade. Although SAVE was not an objective this project, its formation in 2011 to consolidate conservation efforts in India, Nepal and Pakistan and its subsequent expansion to include members from Cambodia, Bangladesh and Myanmar has further disseminated this projects within and beyond South Asia. This project has also facilitated the formation of the Regional Steering Committee for Vulture Conservation, which has members from the governments of Bangladesh, India, Pakistan and Nepal, as well as the IUCN, GEF and SAVE. The Committee has adopted all of SAVE priorities, including the breeding programme and VSZ initiative established as part of this and previous Darwin Initiative projects.

5.3 Capacity building

This project has built both physical and human capacity for vulture conservation in India and Nepal through the development and expansion of captive breeding programmes and provisional VSZs. This project constructed the necessary aviaries, building and infrastructure for India's third (West Bengal) and Nepal's first fully operational VCBCs. We employed centre managers, veterinarians and keepers in Nepal and West Bengal (15 individuals) and trained these staff in vulture husbandry and veterinary care. At our more established centres in Assam and Haryana, we trained existing staff in artificial incubation and brooding to increase the annual fledging success of captive populations. In the future, staff from these centres can train their colleagues in other centres in this so called "double clutching". The result of these actions has increased the fledgling success of combined captive population by 82 between 2009 and 2013.

This project's VSZ Initiative has developed from one Vulture Safe Feeding Site in Nepal to a 30,000km^2 provisional VSZ in Nepal and six zones with a combined area of nearly 30,000km^2 in India. It is within these zones that we focus many of our conservation activities and so we have employed and financially supported local conservationists and communities (at least 26 groups) to carry out these actions and provided them training in best-practice strategies for advocacy, education and monitoring. At six Vulture Safe Feeding Sites in Nepal, we have worked with the local communities to generate income for numerous households either directly and indirectly from these sites. We have also trained our local partners in seek necessary funds to continue and expand their activities from government and non-government grants. Finally, we have trained BNHS and BCN VSZ Coordinators to accurately monitor and evaluate conservation actions with zones.

5.4 Sustainability and Legacy

This project has intrinsically linked VCBCs and VSZs. It is now a SAVE priority to establish VSZs to not only protect persisting vulture colonies but to provide locations to release captive-bred vultures; and continue VCBCs to not only safe guard against extinction in the wild but replenish wild populations. SAVE, now made up of 12 concerned government and non-government organisations from Bangladesh, Cambodia, India, Myanmar, Nepal, Pakistan, the UK and the USA (and including all partners from this project), will ensure the

achievements of this project endure. In addition, the Regional Steering Committee on Vulture Conservation – formed of representatives from the governments of Bangladesh, India, Nepal and Pakistan, and advisers from IUCN, GEF and SAVE – will also ensure VCBCs and VSZs will endure. SAVE holds annual meetings where progress and developments for vulture conservation are discussed to plan and improve future actions. In 2014, SAVE produced "A Blueprint for the Recovery of South Asia's Critically Endangered *Gyps* Vultures", which describes what needs to be done in the next ten years to enable South Asia's vultures to recover. It is hoped that these actions and their timelines are adopted widely by regional conservation organisations, governments and industry.

Both BNHS and BCN are independent attracting funds from granting bodies and governments. For example, BCN has applied for part of a Hariyo Ban grant to expand its VSZ further and the state government departments have paid for additional building at the BNHS breeding centre at Pinjore. Working with VSZ teams and communities within VSZs, as well as communities associated with Vulture Safe Feeding Sites, has massively extended the reach of our activities. In return, these individuals and communities have benefitted through income generation and capacity building. Our VSZ teams now seek their own funds to continue or expand their activities and our Vulture Safe Feeding Sites are either self-sufficient or almost self-sufficient. That being said, the RSPB is committed to funding and finding funds for SAVE priorities.

In addition, our methods are being replicated, which give us hope for the future expansion and sustainability of the vulture conservation in South Asia. Provisional VSZs are established in Pakistan and Nepal (uplands); and are being established in Bangladesh, Myanmar and other parts of India, by SAVE partners or independent conservation organisations that are in line with SAVE objectives (Figure 1). We are providing guidance to all of these groups. The Central Zoo Authority (CZA) of the Government of India has built a number of VCBCs across the country. BNHS and CZA have signed an agreement whereby BNHS provides expertise and vultures to develop a fully operation breeding centre at Bhopal, Madhya Pradesh, to be run by CZA, in return for funds to feeding vultures at BNHS centre at Pinjore for one year. Presently, one BNHS staff member, trained in this project, has been appointed centre manager at the Bhopal centre and is preparing it for 30 vultures to be delivered later this year. The mining company Rio Tinto had expressed interest in establishing a VSZ near one of its operations also in Madhya Pradesh (Figure 1). BNHS and Rio Tinto have signed an agreement whereby Rio Tinto's environmental team will carry out advocacy and monitoring under the guidance of BNHS. The proposal follows strict SAVE guidelines and Rio Tinto will fund the work for five years.

6 Lessons learned

6.1 Key lessons

The initial objectives of this project were not overly ambitious, which was something we had learned from previous Darwin Initiative projects, but the scope of our work became more ambitious as we developed the project, particularly in relation to VSZs. Our aim for *in-situ* conservation developed from establishing more than four Vulture Safe Feeding Sites to developing multiple vast provisional VSZs. We realised that creating true VSZs, where diclofenac had been completely removed, would not be accomplished during this project, but that establishing multiple zones and building capacity in multiple partners over a wide

geographic range was suitable alternative and so we pursed this instead. The progress of this project, like no doubt many other Darwin Initiative Projects, was also delayed by multiple difficulties, some expected and some unexpected. For example, construction at the Nepal breeding centre was hindered by more or less expected shortages in materials and labour; while trialling alternative food sources for captive vultures was hindered by unexpected cultural taboos. From this we learned that flexibility in work plans and timeframes was necessary to move forward.

6.2 Monitoring and evaluation

This project was monitored and evaluated through regular discussions of objectives, plans and progress between the Project Leader and the in-country Project Leaders. This was achieved through a combination of remote communications (i.e., emails and phone calls), face-to-face meetings on the ground and the development of annual work plans and contracts. This project was also monitored and evaluated by annual RSPB and SAVE meetings, which are external to this project, and monitor and evaluate our conservation programme more broadly. All project partners are required to write reports for these meetings. The staggered occurrence of these meetings means that only six months passes between them.

6.3 Actions taken in response to annual report reviews

Not applicable

7 Darwin identity

This project has promoted the Darwin Initiative as the core project funder. All partners are aware of the important role the Darwin Initiative has played in a decade of vulture conservation in South Asia. The Ground Finch logo features on the front page of the *Vulture Rescue* and *SAVE* websites; advocacy and education material distributed throughout provisional VSZs; and on sign boards at the VCBCs and Vulture Safe Feeding Sites. We have acknowledged the Darwin Initiative in all journal articles, presentations and formal communications (i.e., news articles, radio stories and blogs). This project has promoted Darwin Initiative to communities, conservation organisations and state and central governments of Bangladesh, India, Pakistan and Nepal. We are confident that the Darwin Initiative is recognised widely as key partner in vulture conservation in South Asia.

8 Finance and administration

8.1 Project expenditure

Since our last annual report, this project has continued on a no cost extension and thereby we have not spent any funds provided by the Darwin Initiative during this time.

8.2 Additional funds or in-kind contributions secured

Source of funding for additional work after project lifetime	**Total (£)**
SOS: Save Our Species	
LA Zoo	

Goldman Prize	
National Birds of Prey Trust	
Riverbanks and Gardens Conservation Support Fund	
Rufford Foundation	
Exodus Travel	
Private donations	
TOTAL	**125,476**

8.3 Value for Money

We consider this project and previous Darwin Initiative projects to have been money well spent, not least because we are seeing the beginnings of recovery for Critically Endangered *Gyps* vultures in South Asia. The Darwin Initiative first supported our work a decade ago, when vulture populations were crashing and the cause was unknown. Through the support of the Darwin Initiative we have helped establish that diclofenac was the cause of the declines, discovered that meloxicam was a safe alternative to diclofenac and achieved a region-wide ban on the veterinary use of diclofenac. Unfortunately, the threat of diclofenac did not end with the ban, but further support from the Darwin has helped use to establish a vulture conservation breeding programme to ensure these species survival and establish provisional VSZs to protect wild populations. The Darwin Initiative has supported vulture advocacy and education from the community to regional level and monitoring vultures and NSAIDs in veterinary pharmacies and livestock carcasses available to vultures. It is from these data that show a decrease in diclofenac prevalence and increase in meloxicam popularity across years; as well as stabilisation and possible increases in vulture populations. This project, specifically, has allowed us to develop and expand our *in-situ* and *ex-situ* conservation activities. It is these methods that will be linked in our future objective to release captive vultures to supplement wild populations. In addition, it is these methods that are now considered the best-practice for vulture conservation in South Asia for independent conservationists, private companies and governments.

The funding from the Darwin Initiative has therefore had a huge impact for vulture conservation in South Asia, particularly when you consider the geographical scale of this project and the countries now stepping up to take action.

Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year 2013/2014	Actions required/planned for next period
Goal: 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 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			
Purpose To improve trans-boundary collaboration and capacity in Nepal and India to implement effective conservation solutions for Asia's Critically Endangered vulture species	P(1) Increase in number and area of VSZs (VSZ) within Nepal and in neighbouring areas of India P(2) Increased capacity of staff at Vulture Conservation Breeding Centres (VCBCs) and VSZs to sustain vulture conservation activities P(3) Vulture Conservation Breeding Programmes in India and Nepal continue to expand	P(1) In Nepal, one provisional VSZ covers 30 districts; and in India, 5 provisional VSZs cover 29 districts. P(2) In India and Nepal, we maintain the employment of 27 staff members in VCBC and pVSZs. P(3) In India, 26 nestlings reared in Haryana, West Bengal and Assam VCBCs. Double clutching techniques used at Haryana. In Nepal, second colony aviary constructed. In Nepal and West Bengal, vultures attempted to breed.	
Output 1. Expansion of in-situ vulture conservation projects across Nepal and in neighbouring areas of India	>4 VSZs established in Nepal and minimum 1 VSZ established in adjacent areas of India	In Nepal, in situ conservation action managed by BCN has established one large and expanding provisional VSZ, encompassing the initial 4 provisional VSZs. In India, in situ conservation action managed by BNHS has established 6 VSZs. Two Indian VSZs adjoin	

		the Nepal VSZ, forming a trans-boundary VSZ.
Activity 1.1 Sites and local conservation NGO partners identified for expansion of VSZs in Nepal and neighbouring areas of India		BCN works with 19 local NGOs in Nepal to advocate vulture conservation, monitor vulture populations and NSAID availability, and manage Vulture Safe Feeding Sites. BNHS works with 6 local NGOs in India to advocate vulture conservation and monitor vulture populations and NSAID availability.
Activity 1.2 Agreement in place with local and national partners for in-situ work		Agreements maintained.
Activity 1.3 Diclofenac stocks removed and replaced with vulture safe meloxicam in VSZ, infrastructure and agreements in place for herding cattle and feeding sites established around breeding colonies, local advocacy programme and printed materials in place, and monitoring of vulture numbers established by local teams		Diclofenac-meloxicam swapping completed. Six Vulture Safe Feeding Sites maintained in Nepal. Advocacy, education and monitoring programme by local partners and NGOs maintained. Best practice frequently assessed and disseminated among teams.
Output 2. Effectiveness of in-situ conservation actions tested across Nepal and India	2a. Monitoring of vulture populations, use of veterinary drugs, and diclofenac in carcasses undertaken in two geographically distinct areas	Monitoring undertaken at both the national and VSZ level in Nepal and India. First and second round of surveys completed in year one and four, respectively.
Activity 2.1. Minimum of one suitable control site for monitoring effectiveness of in-situ work located in same eco zone in India		Nationwide surveys in both Nepal and India encompass both VSZs and non-VSZs - the latter representing controls.
Activity 2.2. Vulture monitoring, NSAID surveys and carcass samples collected from Nepal and India from in-situ sites and from control area(s) in India		2011 nationwide road transect survey of Gyps vultures in India and Nepal published; for redheaded and Egyptian vultures in India in press; and for Himalayan and bearded vultures in Nepal in review. The 3rd, 4th and 5th nationwide livestock carcass survey for NSAIDs in India are published, in review and being analysed, respectively. The 1st and 2nd VSZ pharmacy surveys in India are published and in preparation for publication; and for Nepal in preparation for publication.
Output 3. Infrastructure for the VCBC in Nepal and West Bengal is increased in capacity	Second colony aviary, chick aviaries, veterinary facility and visitor & education facilities constructed on the site, with supporting infrastructure (water & power) in place in Nepal. Visitor & education facilities at West	All planned facilities built at Nepal VCBC and West Bengal. Water infrastructure in place. Electricity infrastructure nearing completion and will be completed post project.

	Bengal	
Activity 3.1. Continued support from DNPWC and West Bengal State for expansion of project infrastructure at the site in Chitwan National Park and Buxa Tiger Reserve		Support for VCBC is maintained.
Activity 3.2. Design and budget for aviaries and visitor facilities agreed with project partners in Nepal and West Bengal		Completed in previous reporting years.
Activity 3.3. Colony aviary, chick aviaries and visitor facilities constructed		Second colony aviary, laboratory and visitor facilities constructed and fitted out.
Activity 3.4. Pump and tanks installed to improve water supply, and back-up generator bought and installed to provide reliable electricity		Water pump and tanks installed. Backup generators purchased.
Output 4. Breeding Centre staff supported at Nepalese and West Bengal centres for three-year term of project	A minimum of six staff employed and trained by the project in both India and Nepal	A total of 9 staff are employed in both Nepal and India. Additional staff are employed by BNHS in India at no cost to this project.
Activity 4.1. Recruitment and renewed contracts for breeding centre staff in Nepal and West Bengal centres		Staff and contracts maintained.
Output 5. Training and capacity of staff in India and Nepal increased with further cooperation between the two country's programmes	5a. International visits by 2 staff to UK to receive training 5b. Training workshops (2 x 1 week in each year) run by project in host countries and training materials and studbook produced 5c. Annual exchange/training visits between Indian and Nepalese partners in each year of project	5a. In-country training by RSPB staff was identified as better alternative to UK visits by BNHS or BCN staff. However, BCN's vulture manager visited the UK for one month on separate funds. He was trained in data analysis and scientific writing. 5b. Second VSZ advocacy strategy workshop held in India and attended by BNHS, BCN and local NGOs. In place of further training workshops. One-to-one training was provided to BNHS, BCN and all Indian NGOs during 3 visits by the RSPB VSZ Coordinator and Conservation Scientist. 5c BNHS and BCN vulture managers met in November 2012 at the annual project meeting. NGOs from border regions of India and Nepal held a trans-boundary meeting. BNHS staff visited Nepal Vulture Safe Feeding Sites; and BCN staff visited BNHS VCBC.

Activity 5.1. Training requirements for project staff identified, air-tickets bought and dates fixed for staff visits to UK		Training in-country was identified as a better alternative to UK visits by BNHS and BCN staff.
Activity 5.2. Training workshops planned for Nepal/India and ZSL/RSPB/ICBP staff and dates fixed for visits		VCBC and VSZ training continued.
Activity 5.3. Themes and visits for staff in Nepal and India agreed and visits arranged		Regular visits by the RSPB VSZ Coordinator and Conservation Scientist maintained.
Output 6 Trials of alternative food sources for captive vultures undertaken and feasibility of large-scale production assessed.	Small-scale facilities for rearing rabbits/rats and goats/buffalo established with local communities in areas around vulture centres	Funds have been transferred for undertaking a pilot project farming rabbits at the Haryana VCBC (India). Land has been purchased.
Activity 6.1. Small-scale trials of alternative food sources established with local communities surrounding breeding centre in Nepal and West Bengal		Trial to be conducted at the Haryana VCBC.
Activity 6.2. Feasibility study and evaluation of alternative food sources undertaken, with expansion of programme if successful		Trial to take place post project.

Annex 2 Project's full logframe, including indicators, means of verification and assumptions

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: **The establishment of self-sustaining wild vulture populations in South Asia in an environment free from diclofenac**	SG(1) Wild vulture populations increase in numbers and expand in range and captive vulture populations successfully released and surviving in South Asia	Reports to host country governments and peer-reviewed scientific papers document reduction in levels of diclofenac contamination, increasing vulture numbers and successful release of	[redacted]

and other harmful toxins	SG(2) Contamination of vulture food sources with diclofenac and other harmful veterinary drugs falls to levels that will not impact on the population SG(3) Improvement in IUCN threat status of critically endangered vulture species	birds IUCN Red List reflect reduced threat to vultures in Asia	
Purpose To improve trans-boundary collaboration and capacity in Nepal and India to implement effective conservation solutions for Asia's Critically Endangered vulture species	P(1) Increase in number and area of VSZs within Nepal and in neighbouring areas of India P(2) Increased capacity of staff at Breeding Centres and VSZs to sustain vulture conservation activities P(3) Vulture Conservation Breeding Programmes in India and Nepal continue to expand	VSZs are registered within local States/Districts and recognised nationally as focal sites for conservation Training reports and activities produced for partners and posted on project website Breeding centre annual reports to government and international partners document increase in captive vulture numbers and infrastructure	Host countries remain politically stable and local areas surrounding vulture conservation projects remain safe for project staff No other conservation issues arise to provide significant new threat to vulture conservation National and international will and funding remains sufficient to support vulture conservation activities
Outputs 1. Expansion of *in-situ* vulture conservation projects across Nepal and in neighbouring areas of India	1a >4 VSZs established in Nepal and minimum 1 VSZ established in adjacent areas of India	1a. Annual reports for Nepalese and Indian State governments and international partners document establishment of sites	National and local support for *in-situ* conservation continues Local political and economic situation remains stable and safe for project areas
2. Effectiveness of *in-situ* conservation actions tested across Nepal and India	2a. Monitoring of vulture populations, use of veterinary drugs, and diclofenac in carcasses undertaken in two	2a. Peer-reviewed scientific paper detailed results of work produced and published	Monitored vulture populations remain extent Pharmacies and vets allow monitoring of stocks

	geographically distinct areas		
3. Infrastructure for the VCBC in Nepal and West Bengal is increased in capacity	3a. Second colony aviary, chick aviaries, veterinary facility and visitor & education facilities constructed on the site, with supporting infrastructure (water & power) in place in Nepal. Visitor & education facilities at West Bengal	3a. Completed construction and infrastructure in place and documented on project website and reports to Nepalese government and international partners	National and local political situation remains stable and safe for construction to take place Availability of key construction materials, fuel and power to the site during construction Continued support from Nepalese Department of National Parks and Wildlife Conservation for construction on park land
4. Breeding Centre staff supported at Nepalese and West Bengal centres for three-year term of project	4a. A minimum of six staff employed and trained by the project in both India and Nepal	4a. Contracts with BNHS and BCN and annual reports document numbers of staff in employment	Qualified and suitable staff retained and/or available for recruitment to project Local political situation remains safe for staff to work on the project
5. Training and capacity of staff in India and Nepal increased with further cooperation between the two country's programmes	5a. International visits by 2 staff to UK to receive training 5b. Training workshops (2 x 1 week in each year) run by project in host countries and training materials and studbook produced 5c. Annual exchange/training visits between Indian and Nepalese partners in each year of project	5a, b & c. Reports from international visits, training workshops and exchange visits produced for funders and posted on project website Certificates document training received and produced for funders	International visas issued to allow training visits to UK or elsewhere Time and availability of ZSL, RSPB and ICBP staff to visit and run training workshops in host countries [n.b. proposed enrolment of staff on degree courses, mentioned in the stage 1 application, has been removed as while of benefit to individual staff it is not essential for the overall programme. If other funding sources allow this, then this will still be pursued]
6. Trials of alternative food	6. Small-scale facilities for	6. Annual reports produced for	Support and availability of personnel

sources for captive vultures undertaken and feasibility of large-scale production assessed	rearing rabbits/rats and goats/buffalo established with local communities in areas around vulture centres	project funders on success of small-scale projects and feasibility assessment of large-scale project produced	from local community to work on project

Activities

1.1 Sites and local conservation NGO partners identified for expansion of VSZs (VSZ) in Nepal and neighbouring areas of India

1.2 Agreement in place with local and national partners for *in-situ* work

1.3 Diclofenac stocks removed and replaced with vulture safe meloxicam in VSZ, infrastructure and agreements in place for herding cattle and feeding sites established around breeding colonies, local advocacy programme and printed materials in place, and monitoring of vulture numbers established by local teams

2.1 Minimum of one suitable control site for monitoring effectiveness of *in-situ* work located in same eco zone in India

2.2 Vulture monitoring, NSAID surveys and carcass samples collected from Nepal and India from *in-situ* sites and from control area(s) in India

3.1 Continued support from DNPWC and West Bengal State for expansion of project infrastructure at the site in Chitwan National Park and Buxa Tiger Reserve

3.2 Design and budget for aviaries and visitor facilities agreed with project partners in Nepal and West Bengal

3.3 Colony aviary, chick aviaries and visitor facilities constructed

3.4 Pump and tanks installed to improve water supply, and back-up generator bought and installed to provide reliable electricity

4.1 Recruitment and renewed contracts for breeding centre staff in Nepal and West Bengal centres

5.1 Training requirements for project staff identified, air-tickets bought and dates fixed for staff visits to UK

5.2 Training workshops planned for Nepal/India and ZSL/RSPB/ICBP staff and dates fixed for visits

5.3 Themes and visits for staff in Nepal and India agreed and visits arranged

6.1 Small-scale trials of alternative food sources established with local communities surrounding breeding centre in Nepal and West Bengal

6.2 Feasibility study and evaluation of alternative food sources undertaken, with expansion of programme if successful

Monitoring activities

SG(1): Remnant wild vulture populations increase in numbers and expand in range, captive vultures successfully released and surviving in South Asia – Annual monitoring and reporting of remnant wild population, records of captive vulture populations and breeding success maintained at each centre., records of annual numbers released and annual monitoring and tracking of released birds to determine survival and recruitment rates

SG(2): Contamination of vulture food sources with diclofenac and other harmful veterinary drugs falls to levels that will not impact on the population – Proportion of carcases with diclofenac recorded across representative sample of sites in India and Nepal, and trends in contamination levels reported upon on a 3 yearly basis. Prevalence of diclofenac in pharmacies and levels of drug swapping required in VSZ recorded

SG3: Improvement in IUCN threat status of Critically Endangered vulture species – Population data inputted to Red List Authority review data sets and annual IUCN Red List update enables changes in threat status to be demonstrated

P(1): Increase in number and area of Vulture Safe Areas within Nepal and in neighbouring areas of India – At least 4 VSZ established in Nepal and 1 in adjacent areas of India by end of project, demonstrated by registration documents, functioning feeding, drug swapping and education programmes at new sites, and VSZ boundary maps marking areas diclofenac removed from

P(2): Increased capacity of staff at Breeding Centres and Vulture Safe Areas to sustain vulture conservation activities – Employment and training of 6 centre staff in both India and Nepal for the duration of the project, reports produced by 2 staff that receive training in UK and >4 staff that undertake exchange visits by end of project and feedback forms from at least 8 staff that attend 1 week in-country training courses. Effective establishment and running of centres demonstrated through annual centre reports. VSZs expanded successfully with local community and government support, evidenced by press coverage and MOU between country and local partners.

P(3): Vulture Conservation Breeding Programmes in India and Nepal continue to expand – Infrastructure and capacity of vulture centres expanded and number of vultures taken in to captivity and reared in captivity increased by the end of the project

1a: >4 VSZs established in Nepal and minimum 1 VSZ established in adjacent areas of India – Registration documents with local States/Districts confirm existence of VSZs and maps document location and extent of VSZs

2a: Monitoring of vulture populations, use of veterinary drugs, and diclofenac in carcasses undertaken in two geographically distinct areas. Annual monitoring reports produced for each surveyed population document trends by end of project; drug use assessed through bi-annual carcass sampling and recording of diclofenac availability in pharmacies, reported in scientific and project reports.

3a: Second colony aviary, chick aviaries, veterinary facility and visitor & education facilities constructed on the Nepal site, with supporting infrastructure (water & power) in place. Visitor and education facilities constructed at the West Bengal centre. Site construction plans completed and available for inspection; photos of building works included within reports to Darwin; visitor data reported.

4a: A minimum of six staff employed by the project in both India and Nepal - staff employed by end of year 1, contract details and employment records maintained.

5a: International visits by 2 staff to UK to receive training - Participants produce trip report to be appended with project report to Darwin by end of the project year

5b: Training workshops (2 x 1 week in each year) run by project in host countries to a minimum of 4 staff- Workshop materials produced and report completed at end of each year detailing training covered and attendees, studbook produced and maintained by project partners

Sc: Annual exchange/training visits between Indian and Nepalese partners in each year of project Exchange reports prepared including measures taken to ensure information is passed on within the exchange staff host country
6a: Small-scale facilities for rearing rats/guinea pigs and goats/buffalo established with local communities in areas around vulture centres. Facilities constructed and photos included within project reports. Details of costs and food supply obtained recorded on a 2 monthly basis

Annex 3 Project contribution to Articles under the CBD

Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	-	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	10	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	20	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9.Ex-situ Conservation	20	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	-	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	10	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	15	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	20	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts	-	Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources	-	Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a

Article No./Title	Project %	Article Description
		country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology	5	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	-	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol	-	Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Other Contribution	-	Smaller contributions (e.g. of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1a	Number of people to submit PhD thesis	0
1b	Number of PhD qualifications obtained	0
2	Number of Masters qualifications obtained	0
3	Number of other qualifications obtained	0
4a	Number of undergraduate students receiving training	0
4b	Number of training weeks provided to undergraduate students	18
4c	Number of postgraduate students receiving training (not 1-3 above)	14
4d	Number of training weeks for postgraduate students	31
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(i.e. not categories 1-4 above)	0
6a	Number of people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	33
6b	Number of training weeks not leading to formal qualification	15
7	Number of types of training materials produced for use by host country(s)	5
Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	47
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	0
10	Number of formal documents produced to assist work related to species identification, classification and recording.	0
11a	Number of papers published or accepted for publication in peer reviewed journals	17
11b	Number of papers published or accepted for publication elsewhere	7
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	2
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	0
13a	Number of species reference collections established and handed over to host country(s)	0

Code	Description	Totals (plus additional detail as required)
13b	Number of species reference collections enhanced and handed over to host country(s)	0
Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	2
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	6
15a	Number of national press releases or publicity articles in host country(s)	>17
15b	Number of local press releases or publicity articles in host country(s)	~200
15c	Number of national press releases or publicity articles in UK	0
15d	Number of local press releases or publicity articles in UK	0
16a	Number of issues of newsletters produced in the host country(s)	4
16b	Estimated circulation of each newsletter in the host country(s)	>1750
16c	Estimated circulation of each newsletter in the UK	0
17a	Number of dissemination networks established	0
17b	Number of dissemination networks enhanced or extended	2
18a	Number of national TV programmes/features in host country(s)	1
18b	Number of national TV programme/features in the UK	2
18c	Number of local TV programme/features in host country	1
18d	Number of local TV programme features in the UK	0
19a	Number of national radio interviews/features in host country(s)	>103
19b	Number of national radio interviews/features in the UK	2
19c	Number of local radio interviews/features in host country (s)	>60
19d	Number of local radio interviews/features in the UK	0
Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	£55k
21	Number of permanent educational/training/research facilities or organisation established	0

Code	Description	Totals (plus additional detail as required)
22	Number of permanent field plots established	9
23	Value of additional resources raised for project (See *Section 8.2 above)*	
Other Measures used by the project and not currently including in Dl standard measures		

Annex 5 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal article	Acharya, R., Cuthbert, R., Baral, H.S. and Chaudhary, A. (2010) Rapid decline of the Bearded Vulture *Gypaetus barbatus* in Upper Mustang, Nepal.	*Forktail* 26: 117-120.	Author and RSPB	£0
Journal article	Das, D., Cuthbert, R., Jakati, R.D. and Prakash, V. (2010) Diclofenac is toxic to the Himalayan Griffon Vulture *Gyps himalayensis*.	*Bird Conservation International* 21: 72-75	Author, RSPB and journal website	£0
Journal article	Naidoo, V., Wolter, K., Cromarty, D., Diekmann, M., Duncan, N., Meharg, A.A., Taggart, M.A., Venter, L. and Cuthbert R. (2010) Toxicity of NSAIDs to *Gyps* vultures: a new threat from ketoprofen.	*Biology Letters* 6: 339-341	Author, RSPB and journal website	£0
Journal article	Naidoo, V., Venter, L., Wolter, K., Taggart, M. and Cuthbert, R. (2010) The toxicokinetics of ketoprofen in *Gyps coprotheres*: Toxicity due to zero order metabolism.	*Archives of Toxicology* 84: 761–766.	Author and RSPB	£0
Journal article	Cuthbert, R., Prakash, V., Saini, M., Upreti, S., Swarup, D., Das, A., Green, R. and Taggart, M. (2011) Are conservation actions reducing the threat to India's vulture populations?	*Current Science* 101:1480-1484	Authors, RSPB and journal website	£0
Journal article	Chaudhary, A., Subedi, T.S., Giri, J.B., Baral, H.S., Chaudhary, I., Paudel, K., and Cuthbert, R.J. (2011) Population trends of critically endangered Gyps vultures in the lowlands of Nepal. *Bird Conservation International.*	*Bird Conservation International* 22: 270-278	Authors, RSPB and journal website	£0
Journal article	Cuthbert, R., Taggart, M.A., Prakash, V., Saini, M., Swarup, D., Mateo, R., Chakraborty, S.S., Deori, P. and Green, R. (2011) Effectiveness of Action in India to Reduce Exposure of Gyps Vultures to the Toxic Veterinary Drug Diclofenac.	*PLoS One* 6(5): e19069.	Authors, RSPB and journal website	£0
Journal article	Prakash. V., Bowden C., Cuthbert, R. and Routh, A. (2011) Saving India's Vultures from Extinction – How can Veterinarians contribute to their Conservation?	*Intas Polivet* 12: 123-125.	Authors, RSPB and journal website	£0
Journal	Cuthbert, R.J., Dave, R., Chakraborty, S.S., Kumar,	*Oryx*	Authors,	£0

article	S., Prakash, S., Ranade, S.P. and Prakash, V. (2011) Assessing the ongoing threat from veterinary NSAIDs to critically endangered *Gyps* vultures in India. *Oryx*,	45: 420-426.	RSPB and journal website	
Con-ference article	Chaudhary, A., Chaudhary D. B., Baral, H. S., Cuthbert, R., Chaudhary, I. And Nepali, Y. B. (2011) Influence of safe feeding site on vultures and their nest numbers at Vulture Safe Zone, Nawalparasi	---	Authors and RSPB	£0
Journal article	Saini, M., Taggart, M., Knopp, D., Upreti, S., Swarup, D., Das, A., Gupta, P., Niessner, R., Prakash, V., Mateo, R. and Cuthbert, R. (2012) Detecting diclofenac in livestock carcasses in India with an ELISA: A tool to prevent widespread vulture poisoning	*Environmental Pollution* 160: 11-16	Authors, RSPB and journal website	£0
Journal article	Clements, T., Gilbert, M., Rainey, H.J., Cuthbert, R., Eames, J.C., Bunnat, P., Teak, S., Chansocheat, S. and Setha, T. (2012) Vultures in Cambodia: population, threats and conservation.	*Bird Conservation International* 23: 7-24	Authors	£0
Unpub-lished manual	Prakash, V., Bowden, C., Cuthbert, R., Prakash, N., Routh, A. and Parry-Jones, J. and. (2012) Husbandry Guidelines for 'in range' conservation breeding programmes of *Gyps bengalensis, Gyps indicus* and *Gyps tenuirostris. Unpublished manual,* Bombay Natural History Society, Mumbai, India.	*BNHS*	Authors and RSPB	£0
Journal article	Prakash, V., Bishwakarma, M.C., Chaudhry, A., Cuthbert, R., Dave, R., Kulkarni, M., Kumar, S., Paudel, K., Ranade, S., Shringarpure, R., Green, R.E. (2012) The population decline of *Gyps* vultures in India and Nepal has slowed since veterinary use of diclofenac was banned	*PLoS One 7(11): e49118.*	Authors, RSPB, journal website and SAVE website	£0
Journal article	Bowden, C.G.R., Prakash, V., Ranade, S., Routh, A., Jakati, R.D., Cuthbert, R.J., Rahmani, A.R., Green, R.E., Prakash, N. and Parry-Jones, J. (2012) Conservation breeding for the future release of the critically endangered Asian *Gyps* vultures – progress of the programme in South Asia and why it is so important.	*Journal of the Bombay Natural History Society* 109: 43-45.	Authors, RSPB & SAVE website	£0
Journal article	Chaudhary, A., Subedi, T.S., Giri, J.B., Baral, H.S., Chaudhary, I., Paudel, K., and Cuthbert, R.J. (2012). Population trends of critically endangered *Gyps* vultures in the lowlands of Nepal.	*Bird Conservation International* 22: 270-278	Authors, journal RSPB & SAVE website	£0
Journal article	Ghorpade, P.B, Gupta, P.K., Prakash, V., Cuthbert, R.J., Kulkarni, M., Prakash, N., Das, A, Sharma,	*Springer Plus* 1:62	Authors, journal	£0

	A.K. and Saini, M. (2012) Molecular sexing of threatened *Gyps* vultures: an important strategy for conservation breeding and ecological studies.		RSPB & SAVE website	
*Journal article	Sharma A.K., Saini M., Singh S.D., Prakash V., Das A., Bharathi Dasan R., Pandey S., Bohara D.L., Galligan T.H., Green R. E., Knopp D., Cuthbert R.J. (*In press)* Diclofenac is toxic to a non-*Gyps* vulture and an *Aquila* eagle: increasing the diversity of raptors under threat of NSAID misuse.	*Bird Conservation International*	Authors	£0
*Journal article	Galligan T.H., Prakash V.M., Kulkarni M., Shringarpure R., Prakash N., Ranade S., Green RE., Cuthbert R.J. (*In press)* Population declines in Egyptian vulture and red-headed vulture in India have slowed or reversed since the 2006 ban on veterinary diclofenac.	*Bird Conservation international*	Authors	£0
Journal article	Paudel K., Galligan T.H., Acharya R., Baral H.S., Shah, K.B, Cuthbert R.J. (*In review*) Population recovery in Himalayan griffon and stabilisation in bearded vultures in upper Mustang, Nepal	*Animal Conservation*	Authors	£0
Journal article	Galligan T.H., Taggart M., Prakash V., Saini M., Upreti S., Das A., Cuthbert R.J. and Green R.E. (*In review*) The good, the bad and the untested: prevalence and patterns of use in meloxicam, diclofenac and seven other NSAIDs in vulture food in India	*PLoS One*	Authors	£0
*Journal review (invited)	Cuthbert R.J., Taggart, M.A., Prakash V.M., Chakraborty, S.S., Deori, P., Galligan, T.H., Kulkarni, M., Ranade, S., Saini, M., Sharma, A.K., Shringarpure, R. and Green, R.E. (*in review*) PIE in the sky: avian scavengers and the threat from veterinary pharmaceuticals	*Philosophical transactions of the Royal Society B: Biology*	Authors	£0
Journal review (invited)	Mukherjee A., Galligan T.H., Prakash V., Paudel K., Khan U. and Bowden C.G.R. (*In preparation)* The Vulture Safe Zone approach to saving vultures in South Asia	*Mistnet (requested)*	Authors	£0
Journal review	Galligan T.H. et al. (*In preparation)* What a Vulture Safe Zone is and how to establish one.	*?*	Authors	£0

Annex 6 Darwin Contacts

Ref No	18-008
Project Title	Trans-boundary solutions to the Asian vulture crisis
Project Leader Details	

Name	Dr Toby Galligan
Role within Darwin Project	Project Leader (last six months), Conservation Scientist for Vulture Safe Zones (previous 1.5 years)
Address	RSPB HQ, The Lodge, Sandy, Beds, UK SG19 2DL
Phone	
Fax/Skype	
Email	
Partner 1	
Name	Dr Vibhu Prakash
Organisation	Bombay Natural History Society
Role within Darwin Project	Project Leader (India)
Address	Hornbill House, Shaheed Bhagat Singh Road, Opp. Lion Gate, Mumbai 400001,
Fax/Skype	
Email	
Partner 2 etc.	
Name	Mr Khadananda Paudel
Organisation	Bird Conservation Nepal
Role within Darwin Project	Project leader (Nepal)
Address	PO Box 12465, Lazimpat, Kathmandu
Fax/Skype	
Email	

Appendices:

Appendix 1: articles

1.1 Cuthbert et al (in review) PIE in the Sky

1.2 Galligan et al (in press) Egyptian and RH Vulture

1.3 Sharma et al (in press) Steppe Eagle

Appendix 2: BNHS press releases and Indian media coverage

Appendix 3: BCN vulture newsletter 2013