Darwin Initiative for the Survival of Species

Annual Report

1. Darwin Project Information

Project Ref. Number	*162/12/027*
Project Title	*Prediction and Management of declines in Gyps species vultures*
Country(ies)	*Jordan, India, Kazakhstan,*
UK Contractor	*Royal Society for the Protection of Birds*
Partner Organisation(s)	*Bombay Natural History Society (BNHS), Bird Conservation Nepal (BCN), Natural Research UK (NR), Georgian Centre for Conservation and Wildlife, Todd Katzner, Imperial College London, BirdLife Middle-East, Zoological Society London*
Darwin Grant Value	*231,975*
Start/End dates	*1 October 2003- 31 September 2006*
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	*1 October 2003- 31 March 2004, Report 1*
Project website	*www.vulturerescue.org*
Author(s), date	*Susanne Shultz, 29 April 2004*

2. Project Background

Three species of Asian vultures, Asian white-backed vulture *Gyps bengalensis*, slender-billed vulture *G. tenuirostris* and long-billed vulture *G. indicus*, have undergone catastrophic declines over the last decade. The magnitude and geographic extent of the declines over most of the distributional range has led IUCN to list all three species as Critically Endangered. For the past three years, under a previous Darwin Initiative project (ref. 162/10/013), BNHS together with Zoological Society of London and the RSPB have been investigating the causes of the declines and monitoring the population changes across India. The focus of the research was identifying the possible causes of the declines and the possible role of an infectious disease. The current project was initially designed to lead on from the previous Darwin project and predict the possible spread of the factor causing the declines out of the Indian sub-continent, and to identify ways of managing this problem. However, in May 2003, Dr. Lindsay Oaks from Washington State University announced that residues of an anti-inflammatory veterinary drug, diclofenac, were found in a large proportion of vulture carcasses in Pakistan and diclofenac poisoning was was likely the cause of the vulture declines. Since Dr. Oaks' announcement, the focus of research by the RSPB, BNHS, ZSL partnership has shifted to determining the relative role of diclofenac in the vulture declines over the whole geographic range of the Asian *Gyps* species. We submitted a revised project proposal in September 2003 addressing our change in project focus and possible future implications on the work schedule.

3. Project Purpose and Outputs

The stated purpose in the original project proposal was to develop strategies to minimise the spread of the Gyps disease across the Middle East & Central Asia into Africa and to manage the impacts of Gyps declines.

The announcement of diclofenac as the major factor of the declines in Pakistan has led to changes in the project structure over the past year. We submitted an updated project framework in September 2003 (attached), prior to the anticipated start date of this project on 1 October 2003. The revised purpose of the project is to determine the relative role of different factors in the vulture population declines, to determine the extent of populations of birds that are affected by the declines, to develop, and to institute a management plan to reverse the declines and mitigate their impacts on human and animal health.

Outputs:

1) Current extent of declines established, estimation of current population size of *G. tenuirostris* and potential routes of spread predicted.
2) Identification of relative contribution of different causal agents in declines across range states.
3) Plan for the management of declines produced.
4) Participants from affected countries able to implement and monitor management plan.
5) Gyps population protected from declines.
6) Knowledge gained from project disseminated to governments, scientists and media
7) Funding strategy developed.

4. Progress

The most important achievement during the last reporting period was to establish that exposure to diclofenac residues in livestock carcasses is the major factor causing the vulture population declines across South Asia. Strong evidence has been presented implicating mortality caused by ingestion of residues of the veterinary non-steroidal anti-inflammatory drug diclofenac as the major cause of the decline for the Asian white-backed vulture in the Punjab Province of Pakistan (Oaks et al. 2004). After the diclofenac announcement, we developed a research plan to determine whether diclofenac is also the major cause of vulture declines in India and Nepal. To achieve this, we have refined methodology to allow the extraction of diclofenac from tissue samples in India and Nepal, and verified an analytical method for detecting diclofenac in the extracts at two independent laboratories in the UK. Post-mortem examination of 28 vulture carcasses and found that visceral gout was evident in 72% of the carcasses. Twenty-one carcases were tested for diclofenac residues (at Central Science Laboratory UK); all of the vultures with visceral gout had detectable levels of diclofenac whereas none of the birds without visceral gout had detectable diclofenac residues. Thus, as diclofenac residues are perfectly associated with visceral gout, then we can infer that 72% of observed vulture mortality in India and 85% in Pakistan (Oaks *et al.* 2004, see appendices) is caused by diclofenac. This assumes that the birds we collected are representative of all birds dying, but this is a reasonable assumption.

In response to the diclofenac findings in Pakistan, the Royal Society for the Protection of Birds, Zoological Society of London, Bombay Natural History Society, Bird Conservation Nepal, The Peregrine Fund, BirdLife International, and

Ornithological Society of Pakistan signed a joint manifesto in December 2003 acknowledging the role of diclofenac in the declines.

Following these developments the Bombay Natural History Society and the Haryana State government convened an international species action plan workshop, with funding provided by the two Darwin Initiative Projects, in Parwanoo, India from the 12-14 February 2004. The workshop planned for the ZSL Darwin vulture project was designed to consolidate the state of knowledge regarding the vulture declines in India. With additional funding provided by this project, RSPB took a leading role in helping BNHS to extend the workshop into an international South Asian recovery plan workshop, including representatives from neighboring range states and a number of international stakeholder NGO's. The recommendations that resulted from the meeting included call for a ban on veterinary use of diclofenac that presents a threat to vultures and the immediate establishment of a sustainable captive breeding population of all three vulture species. All attendees, including representatives from four state governments in India, five Indian NGO's, and two central government agencies, signed up to the recommendations. Representatives from international NGO's, including the IUCN, The Peregrine Fund, Wildlife Conservation Society, National Birds of Prey Trust, UK, and NGO's from neighbouring countries also signed the recommendations. The first draft of the species recovery plan is currently being circulated for comment.

We have developed a new website (www.vulturerescue.org) and e-mail newsgroup related to the declines.

Excellent progress has been made in the preparations for building the captive centre in Nepal during the next financial year. Initial permits for the capture of vultures and construction have been obtained. Bird Conservation Nepal and the Department for National Parks and Wildlife submitted a joint application for a government land grant, which is currently under review.

Satellite tags have been purchased and sent to India, Georgia and Kazakhstan to be deployed early in the 2004-2005 reporting year. Money has been sent to Georgia from the 2003-2004 budget year, but work is not yet completed (anticipated finish by early June 2004). No birds were satellite tagged in India during the past six months, as it was generally agreed by project members that all trapping efforts should concentrate on bringing birds into captivity.

One of the major components of the initial project proposal was satellite tagging and monitoring in Jordan. As there is little direct threat posed by diclofenac to the vulture populations in the Middle East, with the support of the Middle East partners, we have shifted our activities away from this region. We anticipated fitting at least one satellite tag to a Eurasian Griffon in late 2003, but were unable to obtain satellite tags and organise permits before the beginning of the last breeding season. It is still possible to deploy tags in Jordan in the autumn of 2004, however, given the identification of diclofenac as the major cause of the declines, we strongly feel that these tags would be much more informative if they were deployed in India to provide an indication of the foraging ranges of the Asian Gyps species. Determining foraging ranges will enable us to calculate the radius around extant colonies that would need to be maintained free of diclofenac (through supplementary feeding or working with local communities) to maintain these colonies until a total ban on the veterinary use of diclofenac has been achieved. In addition, preliminary results suggest that Eurasian griffon vultures may also be susceptible to diclofenac poisoning. Consequently, we need to establish the origins of increasing numbers of birds moving into India in winter, so that their breeding colonies can be monitored.

Surveys of slender-billed vultures in India will be completed by 10 May 2004. To date three locations with slender-billed vultures have been identified in Assam State, as well as a number of additional sites with nesting white-backed vultures. Surveys of slender bills that were scheduled to have been completed in Nepal by the end of the first year have not been completed due to Maoist activities in some remote parts of

the country. Although travel to these areas is possible, intensive surveys with field scopes and binoculars were deemed potentially risky.

The most important difficulty we have faced over the past reporting period is the need to totally change the focus of the research programme away from infectious disease and towards diclofenac. Because of the speed with which the information has become available, we have been trying to respond very rapidly and redirect our priorities as needed. This required establishing new collaborative links in India, the UK, and Africa. This has also required shifting work away from the original partner country, Jordan, as the Middle East is no longer seen to be at high risk for future vulture population declines. The dynamic nature of the last six months has made reporting and updating on the progress of the project difficult.

Timetable (workplan) for the next reporting period:

May- Submission of Indian diclofenac results to peer-reviewed journal.

July- Completion of sensitivity testing of African white-backed vultures to diclofenac to determine whether they are as sensitive as Asian white-backed vultures.

August- Four *G. fulvus* satellite tagged in Georgia, five tagged in Kazakhstan.

September- beginning of construction of Captive Breeding Centre in Chitwan National, Park, Nepal

October- Identification of safe alternative(s) veterinary NSAID's to diclofenac.

November- Presentation of possible alternatives in report to *Gyps* range states.

December – Final recovery plan document produced. Submission of additional 3 peer-reviewed papers. Training of 6-8 people in trapping, satellite tracking methodology, and data interpretation.

February/March 2005- Seven birds satellite tagged in India. Acquisition of nestlings and fledgling vultures for Nepalese centre.

March - Description of *G. fulvus* migratory routes and identification of populations at risk of diclofenac exposure. Media outputs achieved.

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

- N/A

6. Partnerships

Existing partnerships: With the exception of discontinuing research in Jordan, there has been no change in regards to relationships with existing partner organisations. The identification of diclofenac as the major cause of the declines has inspired additional collaborative work between the partners.

In addition, a number of new collaborative links have been established with the following organisations:

1) India- Wildlife Institute of India- will address the prevalence of diclofenac in livestock tissues across India.
2) Bangladesh- Wildlife Trust of Bangladesh- to coordinate survey activities in collaboration with BNHS.
3) South Africa- University of Pretoria/ Endangered Wildlife Trust- Vulture Study Group/BirdLife South Africa, South Africa will complete work on identifying safe alternatives to diclofenac.

We have established coordinated research and conservation efforts with the following organisations:

8) South Asia- The Peregrine Fund, Ornithological Society of Pakistan
9) South-East Asia- Wildlife Conservation Society, BirdLife South-East Asia

7. Impact and Sustainability

The announcement of diclofenac as the cause of the declines has resulted in an enormous amount of media interest both internationally and within South Asia. There has been national and local broadsheet and online news coverage as well as a press conference held by the Haryana State Government to announce the recommendations from the species recovery plan. This led to a large number of articles covering the diclofenac story. The central government of India commissioned a position paper by the Indian Institute of Veterinary Sciences and the central government has since convened a meeting to identify an official government strategy for vulture conservation and to engage the pharmaceutical companies to find solutions to the problem. This response by the government has been very quick and supportive for the purposes of this project, and the larger captive breeding programme that is being developed.

8. Post-Project Follow up Activities (max 300 words)

N/A

9. Outputs, Outcomes and Dissemination

Table 1. Project Outputs (According to Standard Output Measures)

Code No.	Quantity	Description
8	19	SS 8 weeks, DP 2 weeks, AC 2 weeks, JPJ 2 weeks, Rhys Green 2 weeks, Peter Newbery 2 weeks, Steve Parr 1 week
9	1	Species Recovery Plan Document
11A	1	One peer reviewed paper (see Table 2).
11B	3	1 paper on diclofenac residues in Indian and Nepalese vultures, 1 paper on the current status of the declines, and 1 paper on modelling the necessary prevalence of diclofenac in the environment to have resulted in the observed declines.
14A	1	Vulture recovery plan workshop organised 12-14 February 2004, Parwanoo, India
14B	9	Talks given at the following meetings: British Ecological Society, Bombay Natural History Society Centenary Journal Seminar, AGM Oriental Bird Club, AGM Vulture Study Group, Full Department Meeting Conservation Science Department RSPB, Annual Research Seminar, Institute of Zoology, London, RSPB AGM, BirdLife World Conference
15A	5	Indian broadsheet and online articles
15B	1	Local daily broadsheet article
15C	8 + 7	National UK articles plus international articles covering declines
17A	2	Project webpage, e-mail news group
19B	1	BBC Radio Four Nature- Feature Story 1/3/04
23	£270,000	£200,000/ 1st year- £100,00/year contribution RSPB, £20,000 Whitley Laing Foundation, £50,000 over two year Zoological Society of London, for Captive Breeding Programmes in India (estimated cost for recommended captive breeding programme c. £500,000-£750,000)

Table 2: Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Scientific article	Saving Asia's Gyps vultures: the 'Vulture Rescue' team's conservation programme, Prakash, V., Pain, D.J., Shultz, S., Cunningham, A.A. In Proceedings of the WWGBP (Budapest 2003)	World Working Group for Birds of Prey	www.raptors-international.de	*In press*
Scientific article	Diclofenac poisoning is widespread in declining vulture populations across the Infdian subcontinent. Shultz,S. Baral, H, Charman, C., Cunningham, A. Das, D., Ghalsasi, G, Goudar, M, Green, R., Jones, A., Nighot, P., Pain, D. & Prakash, V.	Biology Letters		*Submitted*
Species Recovery Plan	South Asian vulture recovery plan	RSPB	www.vulturerescue.org	*In press*

10. Project Expenditure

Table 3: Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure	Balance

Summary of Changes to Budget

2003-2004		***2004-2005***	

11. Monitoring, Evaluation and Lessons

- We have developed a Science Advisory Team to collaboratively prioritise the research activities under the Darwin Initiative. This team meets at monthly to evaluate current progress, review deadlines, and set activities to be addressed in the next period. We have recommended that similar advisory committee's are convened to oversee the captive breeding programme and the advocacy and policy work on diclofenac.
- This past year has demanded flexibility and adaptive management for the project. As more information has become available about the role of diclofenac in the declines, we have had to re-evaluate our priority actions.

12. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum)

■ **I agree for ECTF and the Darwin Secretariat to publish the content of this section**

The catastrophic decline of Asian vulture populations has driven concerted research efforts by several international research groups over the previous five years. In May of 2003, Dr. Lindsay Oaks, together with The Peregrine Fund announced the finding of diclofenac residues in vulture tissues from Pakistan. Since this time, The Peregrine Fund's findings have been published in Nature. In response to this announcement, our research team has been able to confirm that diclofenac is the most important factor driving the declines in India as well as Pakistan. We have initiated research into alternative drugs that can replace diclofenac on the veterinary market and have held an international workshop in India to develop a recovery plan to address the

declines. This has been followed up with government meetings in India with pharmaceutical companies to find a solution to the diclofenac problem. With international support, the captive breeding programmes in India and Nepal are being greatly expanded in order to hold sufficient numbers of vultures to form the basis of a reintroduction programme. This has been possible only through the increased level of collaboration and cooperation that has developed between the different national and international NGO's involved with the vulture work.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2003/2004

Project summary	Measurable Indicators	Progress and Achievements April 2003-Mar 2004	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 poor 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 evaluate the relative importance of different cause of declines, including toxins and disease. Mitigation of population declines and potential species extinction. Develop strategies and capacity to minimise spread of Gyps declines across the range states and manage the impacts of Gyps declines.*	*Representatives of at least 10 key Gyps range states endorse and agree to work towards implementation and management plan.* *>50% of actions Identified within the plan being implemented within 2 years.*	• *Established diclofenac as the major cause of declines across South Asia.* • *Held International South Asian Recovery Plan workshop, February 2004.* • *Recommendations from Recovery Plan meeting signed by workshop attendees including government representatives from 3 Indian States and representatives from other agencies in XX countries, X of which are Gyps range states.* • *Signed manifesto supporting the role of diclofenac in vulture declines.*	• Commence priority activities from the final recovery plan document. • Identify safe alternatives to diclofenac and phase out diclofenac as veterinary drug in India.
Outputs			
Current extent of declines established, estimation of current population size of G. tenuirostris *& potential routes of spread predicted.*	*International scientific community endorses the results of research.*	• *One manuscript in prep that covers the current rate of declines across India. Information network established with Wildlife Conservation Society, and Birdlife South-East Asia to collate information on known Gyps populations across South East Asia.* • *Satellite tags purchased and sent to partners.*	• Expand monitoring and survey work to include S.E. Asia. • One survey planned for Bangladesh, work from S.E. Asian network to undertake additional surveys in South-East Asian *Gyps* range states. • Birds satellite tagged in Caucuses,

			Kazakhstan and India.
Identification of relative contribution of different causal agents in declines across range states.	*Key evidence identified and reviewed by participants from Gyps range states (6-8 Asian countries) currently affected by declines.*	• *Diclofenac accepted as the major cause of declines in South Asia.* • *Modelling exercise completed that demonstrates the small proportion of cattle need to contain diclofenac to have caused the declines. Paper produced and ready for submission.*	
Plan for the management of declines produced	*Plans developed & produced collaboratively by participating organisations in the Gyps range states.*	• *First draft of species recovery plan in circulation to all relevant stakeholders across Gyps range states.*	• Final draft of recovery plan to be produced and circulated to relevant government officials in Gyps range states and other stakeholders.
Participants able to implement & monitor management plan.	*8-10 staff from 4 countries trained in satellite tagging (Jordan, India, Kazakhstan, Georgia?); Two databases developed; a serum bank established; email network created*	• *Initial samples collected for serum bank. Enquiries sent to source additional samples.*	• 4-6 staff trained from 3 countries in satellite tracking
Gyps population protected from declines	*Captive breeding centre established. Staff trained in care and management of facility.*	• *Permits acquired for building centre and capturing vultures for Nepalese centre.*	• Acquisition of land for centre. • Construction of centre and capture of slender-billed and white-backed vultures for centre.
Knowledge gained from project disseminated to governments, scientists & media	*10 media events annually; 3 electronic newsletters; 9 presentations; 4 papers & 10 articles published*	• *New website established www.vulturerescue.org* • *E-mail newsgroup established with more than 40 active members, two project updates circulated.* • *Nine presentations given.* • *One paper in press, one submitted.* • *More than 20 news articles published on diclofenac findings.*	• Three additional peer-reviewed papers to be submitted. • Updates provided for website and e-mail newsgroup.

Funding strategy developed	*3 staff trained in fundraising, strategy agreed.*	• *Funding raised internally through RSPB and ZSL, further funds obtained from Rufford Foundation to support expanded captive breeding programme.*	• Additional funding to be raised to support the expanded vulture conservation programme within the partner organisations
NEW OUTPUT- *Elimination of diclofenac as a threat to Asian vulture populations*	*Diclofenac removed from the veterinary marketplace. Livestock treated with safe alternative to diclofenac.*	• *Established collaborative links with S.A. Vulture Study Group and University of Pretoria to conduct safety trials for alternative drugs using African white-backed vultures*	• Identification of safe and viable NSAID alternatives for Indian veterinary market.