Darwin Initiative

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)	India, Nepal, Kazakhstan, Georgia, Cambodia, South Africa
UK Contractor	Royal Society for the Protection of Birds
Partner Organisation(s)	Bombay Natural History Society (BNHS); Wildlife Institute of India; Indian Veterinary Research Institute; Bird Conservation Nepal (BCN); Natural Research UK (NR); Georgian Centre for Conservation and Wildlife; BirdLife International in Indochina; Wildlife Conservation Society – Cambodia; Faculty of Veterinary Science, University of Pretoria, South Africa; De Wildt Cheetah and Wildlife Trust, South Africa; Rare and Endangered Species Trust, Namibia; Biodiversity and Nature Conservation Association, Myanmar.
Darwin Grant Value	231,975
Start/End dates	1 October 2003- 31 September 2006
Reporting period	1 April 2005 - 31 March 2006, Report 3
Project website	www.vulturerescue.org and www.vulturedeclines.org
Author(s), date	Richard Cuthbert, 29 April 2006

2. Project Background

Three species of Asian vultures, Oriental white-backed (*Gyps bengalensis*), slender-billed (*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), the Bombay Natural History Society (BNHS) together with Zoological Society of London (ZSL) and the Royal Society for the Protection of Birds (RSPB) have been investigating the causes of the declines and monitoring vulture 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 factors causing the declines out of the Indian sub-continent, and to identify ways of managing this problem. However,

in May 2003, the Peregrine Fund 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 the likely cause of the vulture declines. Since this announcement, the focus of research by the RSPB, BNHS, ZSL partnership has shifted to determining the 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 the change in project focus and possible future implications on the work schedule.

3. Project Purpose and Outputs

Purpose

The 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:

a. Current extent of declines established, estimation of current population size of *G. tenuirostris* and potential routes of spread predicted.

b. Identification of relative contribution of different causal agents in declines across range states.

c. Plan for the management of declines produced.

d. Participants from affected countries able to implement and monitor management plan.

e. Gyps population protected from declines.

f. Knowledge gained from project disseminated to governments, scientists and media.

g. Funding strategy developed

4. Progress

Project history to start of this reporting period

The discovery that the veterinary drug diclofenac is the main, if not the only cause, of vulture declines in India, Nepal and Pakistan (Green et al 2004; Oaks et al. 2004; Schultz et al 2004), has shaped the direction of the project over the last two years. An international species action plan workshop in 2004 called for a ban on the veterinary use of diclofenac and the immediate establishment of captive breeding populations of all three vulture species. The project has been working towards this aim and in March 2005 we were asked to produce a report for the Indian Wildlife Board meeting on the role of diclofenac and potential safe alternative veterinary drugs. The meeting was attended by the Indian Prime Minister who announced India's intention to phase out the veterinary use of diclofenac within six months. In order to facilitate a diclofenac ban it was necessary to find a vulture safe alternative to diclofenac that can be used for veterinary purposes. Collaborative research was established by this project with Pretoria University, South Africa, and safety testing was initiated on *Gyps* vulture species in Southern Africa. To help involve Indian scientists in this work, the RSPB sponsored a visit by Indian scientists from the Indian Veterinary Research Institute (IVRI) and the Bombay Natural History Society (BNHS), to South Africa. South African researchers, the RSPB, IVRI and BNHS agreed to undertake safety testing of *Gyps* vultures in India. Agreement was reached to establish a second Vulture Conservation Breeding Centre in West Bengal State in the east of India. Darwin funds for a breeding centre originally planned for Nepal were transferred to the West Bengal centre because of uncertainty over the viability

of a centre in Nepal in the current political situation. Work was also initiated in Cambodia, where small populations of Orient White-backed and Slender-billed vultures remain.

Project achievements in last year

Research and Publications

The major research achievement over the last year has been the continuation of safety testing of an alternative drug to diclofenac in collaboration with Pretoria University, BNHS and IVRI. Two publications have arisen from this: the first indicating that diclofenac is likely to be toxic to all Gyps vulture species and that the African white-backed vultures is suitable surrogate species for safety testing alternative drugs. This paper was published in the journal Biology Letters (Swan et al 2006a). The second paper details the results of the safety of the alternative drug, meloxicam, to African white-backed vultures and two of critically endangered Asian species. The lack of a safe alternative that is still effective for the treatment of livestock has been a major hurdle in pushing for a ban on diclofenac. This paper was published in the journal Public Library of Science (PLoS Biology; Swan et al 2006b), a prestigious journal that is freely available online. The article was published in time for it to be presented and distributed at an international meeting on vulture conservation organised by the Indian Ministry of Environment and Forests (MoEF) in January 2006. The meeting and the paper achieved considerable media attention, with newspaper and radio articles published in India, Nepal, UK and the USA. A third paper is now accepted for publication (Cuthbert et al in press), this presents survey results for Egyptian and Red-headed vultures that were recorded on road transects across India in 1991-93, 2000, 2002 and 2003. The paper indicates that both of these species are undergoing widespread and rapid population declines. The cause of these declines is not established, but diclofenac is the prime candidate. The conservation status of both these species is being reassessed by BirdLife International.

India

The international meeting organised by the Indian Ministry of Environment and Forests (MoEF) on the 31st January and 2nd February 2006 produced articles about the vulture situation in most of the national papers. The meeting made a strongly worded call for a ban on the veterinary use of diclofenac throughout the region, as well as promoting vulture conservation breeding centres. Progress on banning diclofenac has been slow, and the deadline set by the Indian Prime Minister for a phase out of the ban has passed. Currently there are State wide bans on the state veterinary use of diclofenac in six Indian States and a total ban in one state. The findings, by this project, of a safe alternative to diclofenac should help in the push for firm action. The vulture conservation breeding centre in Pinjore (Haryana State) is being expanded. A third large flight aviary is under construction and an operating quarantine aviary has been constructed 4km from the breeding aviaries. The main centre now has state-of-the-art CCTV facilities in two colony aviaries, allowing birds to be checked daily with no disturbance. The Pinjore centre will have the capacity for 150 vultures and at the time of writing holds over 110 birds. The centre's goat bill is steadily rising with increasing vulture numbers. A total of three veterinarians and three field biologists are now employed by the project. At the new centre in West Bengal, laboratory and accommodation facilities are completed along with two temporary holding cages that currently house 15 vultures, including slender-billed vultures, the rarest of the three endangered species. A large flight aviary is currently under construction and will be completed in May 2006. Obtaining permits for catching has been easier in 2006, although problems remain. In June 2005 nine long-billed vulture chicks were captured by a team two rock climbers, and a further 26 long-billed chicks have been captured in 2006. 24 slender-billed vultures were caught in Assam State in Northeast India, and 20 white-backed vultures that were injured in Gujarat State have recently been transferred to the centre.

Nepal

Nepal has made progress in discussions on a ban on the veterinary use of diclofenac and a good working relationship has been established with government officials in the relevant agricultural and veterinary departments. The main Nepali manufacturer of diclofenac has stopped producing the drug and is now switching his efforts to manufacturing meloxicam. He has recently succeeded in having meloxicam licensed as a veterinary drug within Nepal, and hopes to be in production by June 2006. Vulture monitoring work and surveys of slender-billed vultures was carried out in four districts of Nepal. Himalayan Griffon population monitoring work was carried out in Mustang and the Annapurna region. These surveys will be compared with previous surveys (in 2000, 2003 and 2004) to see if the population is stable or declining. Community education and awareness activities were conducted in two districts. A total of 2000 posters were distributed. Positive impact from this education and community awareness was felt on a recent visit. Questionnaire surveys on vulture conservation were undertaken in four districts. Most villagers have positive attitude towards vultures and some seemed to understand their wider role in the society and ecosystem. Work has also started on a cattle farming programme in one district of Nepal to provide a safe road resource to nesting vultures in the area. One adult White-backed vulture was caught and fitted with a satellite transmitter and there are plans to carry out more trapping in June to deploy the remaining transmitters. To help raise awareness of vulture conservation, the 7th Open Nepal Paragliding Championships were run under the theme of “SOS Vultures – Save Our Soarers”. A total of 72 competitors from 25 countries competed, and the opening and closing ceremonies were attended by Nepali government ministers. News on the event and vulture conservation occurred on at least 3 days spread out over the week, and on each day was in 7+ national newspapers (2 English language and 5+ Nepali), on local and national radio stations, and on national TV stations. International radio coverage occurred with the BBC World Service and BBC Asia (UK). The event also raised over £500 for Bird Conservation Nepal to be used for vulture conservation. The competition website details the event: www.saveoursoarers.com

Southeast Asia

Tracking of Oriental white-backed and slender-billed vultures has proceeded in Cambodia in 2005 and 2006, with the deployment of 3 satellite transmitters. A trapping team is currently trying to capture birds to deploy another 3 devices supplied by this project. This work in Cambodia is also estimating population size of vulture species through a network of vulture feeding sites where satellite tagged and wing-tagged birds are recorded. Work in Cambodia received a setback with the loss of two satellite-tagged vultures that were shot and killed. These losses reveal the threats posed to vultures in the region, despite the absence of diclofenac. Community education and awareness of vulture conservation is underway. Plans to establish similar work in Myanmar are now underway and a MOU has been signed between with BirdLife International *in Indochina* and the Myanmar Biodiversity and Nature Conservation Association (BANCA). Vulture surveys and monitoring work are scheduled to begin in September 2006.

Caucasus

In collaboration with Natural Research UK, the project has been involved with vulture monitoring and tracking working in the Caucasus. Fieldwork has been undertaken in Georgia, Azerbaijan and Armenia in partnership with the Georgian Centre for the Conservation of Wildlife, the Azerbaijan Ornithological Society and the Armenian Society for the Protection of Birds. Colonies of Eurasian Griffon vultures have been located in all three countries and monitoring of populations is underway. Satellite tracking of Griffon vultures has continued in Georgia.

Significant difficulties

There is good National Government support for the project, however full cooperation from state government and state institution officials is also required. The previously very supportive Chief Wildlife Warden in Haryana State was replaced in early 2005 by a less cooperative bureaucrat. Obstruction and difficulties created by this one official prevented the capture and transfer of birds from within and outside Pinjore State (where the Pinjore breeding centre is located) for most of 2005. He has now been replaced by the original Chief Wildlife Warden, who is again continuing his excellent support for the project. In spite of the recent successes in capturing birds, there are still considerable difficulties, especially arranging permits allowing capture and transport of birds. The red-tape involved is slowing the catching operations and remains a considerable worry. Plans to undertake satellite tracking of vultures in India have also been hampered due to difficulties obtaining permits. Political instability within Nepal remains a major concern, and the project has managed to proceed despite the difficulties occurring there. However, fieldwork planned for several sites has either had to be transferred or delayed because of the political situation. Plans for establishing a breeding centre are still being discussed and will hopefully proceed in the near future.

Timetable for the next year

May	Last stage of meloxicam safety testing completed in India
	Capture of vultures in Cambodia for satellite tracking and repeat monitoring work
	Report on safety of meloxicam submitted to Indian Ministry of Agriculture
	Submission of manuscript from survey questionnaire results on NSAID safety to scavenging birds
	Submission of manuscript on diclofenac kinetics in Indian cattle and goats
	Submission of manuscript on toxicity of diclofenac to Himalayan Griffon
June	Capture of resident breeding vultures in Nepal for satellite tracking
	Meeting in Nepal to advocate for diclofenac ban
	Continuation of community conservation activities in Nepal
	Completion of colony aviary at new breeding centre in West Bengal
	Submission of manuscript on safety of meloxicam to *Gyps* vultures and scavenging birds in India
July	Completion of third colony aviary at Pinjore breeding centre
	Submission of manuscript on prevalence of diclofenac residues in livestock carcasses in India and impact on vulture populations
August	Vulture workshop in India either directed towards veterinary and pharmaceutical industries, or towards promoting vulture conservation breeding centres
September	Fieldwork in Myanmar commences
	Continuation of community conservation activities in Nepal
	Submission of manuscript on surveys of Himalayan Griffon in Nepal

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

N/A

6. Partnerships

Successful collaboration between the RSPB and our existing project partners has continued during 2005-2006. No major difficulties have been encountered and all of the working relationships continue to progress. One new partnership to have arisen over the last year is with Myanmar and an MOU has been signed between the RSPB and BirdLife International *in Indochina* and the Myanmar Biodiversity and Nature Conservation Association (BANCA).

7. Impact and Sustainability

The issues regarding vulture conservation and the role of diclofenac have received considerable media and scientific interest within India and internationally. There has been national and local broadsheet and online news coverage of vulture conservation in India and Nepal, and it has been widely reported on international news websites and in the conservation literature.

The implementation of a diclofenac ban in India will have a major impact on the effort to conserve *Gyps* vultures in India and throughout south Asia. The role of diclofenac has raised awareness of the whole issues of drug residues in carcasses and the environment, and other countries in Africa and South America are now becoming aware of the potential impact of residues.

Captive breeding centres in India are also raising increasing awareness of conservation, and the training of veterinarians and staff at these centres has raised the capacity within India to ensure the long-term viability of these captive centres. These centres are now being run and managed almost exclusively by BNHS staff. Plans to establish centres in Nepal and Pakistan are now starting.

Establishing long-term funding for the project, particularly for captive breeding that requires a 20+ year commitment, remains difficult. However, support for additional captive breeding work was recently announced (at the MoEF meeting in January) by the India Central Zoo Authority. Several states in India are also talking seriously on establishing their own centres. And in Nepal, the King Mahendra Trust for Nature Conservation is working in partnership with ZSL and the RSPB to initiate temporary holding facilities for vultures.

8. Outputs, Outcomes and Dissemination

The amount of publicity and coverage that the vulture project has received has again made it difficult to quantify the number of outputs, particularly within India and Asia. The amount of publicity has been considerably greater than the original estimated outputs.

The main outputs not yet achieved are satellite tracking of vultures in India due to difficulties obtaining permits. Satellite tracking in Nepal is now underway.

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

Code No.	Quantity	Description
6A.4	6 people	6 people (3 vets + 3 technicians) are now trained in vulture captive management, surgical procedures and care for raptors, and capture and fitting of satellite transmitters
6B.3	8 weeks	Visits by Richard Cuthbert, Mike McGrady, Nick Lindsey (ZSL), Andrew Routh, Clyde Hutchinson and Andrew Cunningham (ZSL) have provided training to staff at the vulture conservation breeding centre and to field staff in Nepal and India and the Caucasus
8	43 weeks	Richard Cuthbert (18 weeks), Chris Bowden (12 weeks), Mark Taggart (6 weeks), Andrew Cunningham (2 weeks), Debbie Pain (1 week), Mike McGrady (4 weeks)

11A	3	Three peer reviewed papers (see Table 2)
11B	6	6 papers to be submitted on: (1) population trends of Himalayan Griffon vultures, (2) pharmacokinetics of diclofenac in Indian cattle, (3) tissue residue times of diclofenac within carcasses and impact for vultures, (4) safety of meloxicam to other scavenging species, (5) results of survey of toxicity and safety of NSAIDs to raptors, and (6) toxicity of diclofenac to Himalayan Griffon vulture
14B	10	Talks and seminars given at the following: Percy FitzPatrick Institute, University of Cape Town; Faculty of Veterinary Science, University of Pretoria; Bombay Natural History Society Annual meeting; International Meeting on Vulture Conservation, Indian Ministry of Environment and Forestry; Asia Section meeting of Conservation Biology Society, Nepal (2); King Mahendra Trust for Nature Conservation, Nepal; Full Department Meeting Conservation Science Department RSPB, RSPB members group meetings (2)
15A 15B 15C	>30	Three press releases have been released by the RSPB in the last year, with a minimum of two press releases made in India. A press release was also made by Defra on the visit of minister Jim Knight to the breeding centre in India and the discovery of the safety of meloxicam Considerable publicity has resulted in the course of the year from the publication of scientific papers (particularly the meloxicam paper) and the international meeting on vulture conservation (January 2006) and the Save Our Soarers paragliding competition in Nepal. A search on “Google” reveals over 500 results for a search on “diclofenac ban in India”. Published articles in newspapers include pieces in The Guardian, The Daily Telegraph, the International Herald and Tribune and the New York Times. Recent articles on the web reporting on the vulture project include: www.saveroursoarers.org www.defra.gov.uk/news/2006/060204a.htm www.the-scientist.com/news/display/23334 www.nature.com/news/2006/060130/full/060130-2.html - news.bbc.co.uk/2/hi/science/nature/4663800.stm www.birdlife.org/news/news/2006/02/**vulture**_update.html www.pubmedcentral.nih.gov www.indiatogether.org/2006/apr/env-**vulture**s.htm - www.rspb.org.uk/supporting/campaigns/birds/asian**vulture**s/news/hope.asp www.islamonline.net/English/Science/2006/04/article07.shtml www.thehindubusinessline.com/2006/02/09/stories/2006020902230300.htm It has not been possible to keep track of the number of articles published on vultures in India, but vultures feature regularly (>50 times in the year) in both national and local

		papers. Over 10 articles have appeared in Nepal.
17A	1	Project website is established
18A 18B 18C	5+	Richard Cuthbert, Debbie Pain, Rhys Green, Chris Bowden, Mark Avary, Nita Shah and Vibhu Prakesh have all been interviewed for documentaries on vulture conservation in Asia. A vulture conservation advocacy film has been launched in India which will achieve nationwide coverage
19A 19B 19C	>15	UK publicity on vultures includes 3 interviews on the BBC World Service, BBC Asia Today, Radio 4's Leading Edge programme Radio interviews conducted in Nepal (>5), India (>8)
21	2	Two vulture conservation breeding centres now established in India, with trained staff
23	£184,000	£70,000 from RSPB towards staff costs and overheads and funding NSAID safety testing in South Africa and research on the prevalence of diclofenac in India £4,000 from Zoological Society of London for overheads £100,000 contribution from RSPB, covering vulture advocacy work and captive breeding £10,000 contribution from Zoological Society of London, for Captive Breeding Programmes in Nepal

Table 2: Publications

Type	Detail	Publishers	Available from	Cost
Scientific article	Toxicity of diclofenac to Gyps vultures. Swan, G., Cuthbert, R., Quevedo, M., Green, R., Pain, D., Bartles, P., Cunningham, A., Duncan, N., Lindsay Oaks, J., Parry-Jones, J., Taggart, M., Verdoorn, G. & Wolter, K. (2006a)	Biology Letters (2006), DOI: 0.1098/ rsbl.2005.0425	RSPB	£0
Scientific article	Removing the Threat of Diclofenac to Critically Endangered Asian Vultures. Swan, G., Naidoo, V., Cuthbert, R., Green, R., Pain, D., Swarup, D., Prakash, V., Taggart, Bekker, L., Das, D., Diekmann, J., Diekmann, M., Killian, E., Meharg, Patel, R., Mohini, S. & Wolter, K. (2006b)	PLoS Biology (2006) **4(3)** DOI: 10.1371/journal.p bio.0040066	www.vulturedeclines.org www.plosbiology.org	£0
Scientific article	Rapid Population declines of Egyptian Vulture *Neophron percnopterus* and Red-headed Vulture *Sarcogyps calvus* in India. Cuthbert, R., Green, R., Ranada, S., Saravanan, S., Pain, D., Cunningham, A. & Prakash, V. (2006)	Animal Conservation (2006) in press	RSPB	£0

9. Project Expenditure

Item	Budget	Expenditure	Balance

Project costs for rents, rates and overheads were again higher than originally budgeted as extra funds directed to India pay BNHS overheads at a rate of 15% of project costs, rather than the 10% anticipated. The increasing size of the project in Nepal and India and the need to undertake research and run breeding centres has meant that the number of staff employed by the project has grown, and the salary costs have increased. These salary costs were offset by savings in capital expenditure. Lastly, while no budget was allocated for conference costs, the presence of the first Society for Conservation Biology Asia meeting in Nepal was a good opportunity for one of the Indian veterinary team to attend an international conference and meet other delegates working on vultures in the region.

10. Monitoring, Evaluation and Lessons

We have developed a Science Advisory Team to collaboratively prioritise the research activities under the Darwin Initiative. This team regularly discusses the project as issues arise to evaluate current progress, review deadlines, and set activities to be addressed in the next period.

11. 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 discovery that use of the veterinary drug diclofenac is responsible for the catastrophic decline of Asian *Gyps* vulture populations has driven research and conservation efforts by this project and other international conservation organisations over the previous five years. The project's outstanding achievement in the last year has been the discovery of a vulture safe alternative drug that can be used to replace diclofenac in the treatment of livestock. The research was the result of an international collaboration between veterinary and conservation researchers in India, South Africa, Namibia and the UK. The programme established that the alternative drug, meloxicam, is safe to African white-backed vultures and to two of the critically endangered Asian *Gyps* species at dosages exceeding the maximum levels of exposure that vultures are likely to encounter in the wild. This research was published in the prestigious journal Public Library of Science (PLoS Biology; Swan et al 2006b) and is freely available online. The article was published in time for it to be presented and distributed at an international meeting on vulture conservation organised by the Indian Ministry of Environment and Forests (MoEF) in January 2006. This meeting called for an immediate and rapid ban on the veterinary use of diclofenac in South Asia. The discovery of a vulture safe alternative removes one of the last major obstacles in the push towards a diclofenac ban. The other major achievement of the project has been its involvement in the captive breeding. Two vulture conservation breeding centres are now established in India and hold over 100 birds from all three critically endangered species.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2005/2006

Project summary	Measurable Indicators	Progress and Achievements April 2005-Mar 2006	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 that meloxicam is a vulture safe alternative to diclofenac International meeting called by the Indian Ministry of Environment and Forests calls for a rapid ban on diclofenac and conservation breeding centres Two vulture conservation breeding centres up and running in India, holding over 100 birds	Submit report to Indian Ministry of Agriculture on results from final meloxicam safety testing in India and push for ban on diclofenac Publish results on safety and toxicity of NSAIDs in birds Capture more vultures for the breeding centres
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	Manuscript on population declines of Egyptian and red-headed vultures published in international peer-reviewed journal Surveys for *G. tenuirostris* undertaken in Nepal, India and Cambodia. Tracking of vultures with satellite tags underway in Cambodia, Nepal and the Caucasus	Analyse and publish results of Himalayan Griffon surveys in Nepal Capture more birds for satellite tracking in Nepal , Cambodia and Caucasus Initiate surveys for *G. tenuirostris* and *G. bengalensis* in Myanmar
Identification of relative contribution of different causal agents in declines	Key evidence identified and reviewed by participants from Gyps range states	International meeting on vulture conservation organised by Indian Ministry of Environment and	Publish results of livestock carcass

across range states.	(6-8 Asian countries) currently affected by declines.	Forests (January 2006) calls for rapid ban on veterinary use of diclofenac in south Asia Sampling of livestock carcasses to quantify extent of diclofenac across India completed	sampling in India New survey of livestock carcasses initiated in India in States with and without State-wide veterinary bans
Plan for the management of declines produced	Plans developed & produced collaboratively by participating organisations in the Gyps range states	Species recovery plan available on project website	Ensure recommendations from species recovery plan are undertaken by range states
Participants able to implement & monitor management plan	Project members trained in satellite tagging. Two databases developed; a serum bank established; email network created	Further samples collected for serum bank from vultures in India Staff trained in Nepal in capture and satellite tracking Vulture conservation issues regularly discussed on existing internet listservers	Supply training and resources for establishment of vulture breeding centre in Nepal
Gyps population protected from declines	Captive breeding centre established. Staff trained in care and management of facility.	Two centres in India now up and running and holding over 100 birds from all three threatened species	Two new colony aviaries to be constructed Positive progress on centre within Nepal and transfer of knowledge and training
Knowledge gained from project disseminated to governments, scientists & media	10 media events annually; 3 electronic newsletters; 9 presentations; 4 papers & 10 articles published	Website updated www.vulturerescue.org 10 presentations given. Three papers published or in press in international journals More than 50 news, website and radio articles published on vulture conservation following MoEF meeting, publication of meloxicam results, and Save Our Soarers paragliding competition	Six peer-reviewed papers to be published Vulture conservation and advocacy film launched in India
Funding strategy developed	3 staff trained in fundraising, strategy agreed.	Funding raised internally through RSPB and ZSL Offer from Indian Central Zoo Authority for establishment of additional vulture breeding centre	Additional funding to be raised to support the expanded vulture conservation programme within the partner organisations and to support ongoing

			research efforts
Elimination of diclofenac as a threat to Asian vulture populations	Diclofenac removed from the veterinary marketplace. Livestock treated with safe alternative to diclofenac.	International meeting on vulture conservation calls for rapid ban on veterinary use of diclofenac Results on safety testing of meloxicam published in freely available international journal and presented at international vulture meeting Safety testing meloxicam in India on endangered vultures and other scavenging species completed Nepal making progress towards a diclofenac ban and introducing meloxicam Research underway in South Africa on mechanism of diclofenac toxicity	Final results of safety testing meloxicam in India to be published Continue to lobby in India and Nepal for diclofenac ban Continue research to understand mechanism of diclofenac poisoning and identify safety and toxicity of range of NSAIDs