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)	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; Todd Katzner Imperial College London; BirdLife International in Indochina; Wildlife Conservation Society – Cambodia; Faculty of Veterinary Science, University of Pretoria, South Africa; International Centre for Birds of Prey, South Carolina; Zoological Society of London
Darwin Grant Value	231,975
Start/End dates	1 October 2003- 31 September 2006
Reporting period	1 April 2004 - 31 March 2005, Report 2
Project website	www.vulturerescue.org and www.vulturedeclines.org
Author(s), date	Richard Cuthbert, 29 April 2005

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 factor 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:

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

Project history to start of this reporting period

The discovery of the role of the veterinary drug diclofenac in Pakistan (Oaks et al. 2004) and the confirmation by this project that diclofenac is also responsible for vultures declines in India and Nepal (Schultz et al 2004), has shaped the direction of our research and conservation strategy over the last year. 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 continued rapid decline in vulture populations revealed by road transects across India has confirmed the need for captive breeding centres to safeguard the survival of all three species.

Project achievements in last year

Through population modelling we have shown that diclofenac residues need only be found in 0.2-0.8% of livestock carcasses to cause declines at the rates observed across Asia (Green et al. 2004). Preliminary results from sampling livestock carcasses across India (paper in prep), indicate that there is more than enough diclofenac in the environment to cause the vulture declines, confirming the conclusions of the population modelling that diclofenac is the main, if not the only, cause of the vulture declines.

The role of diclofenac has been widely reported in the media across India, and the work of BNHS and this project has helped produce a ban in late 2004 and January 2005 in two Indian States on the state veterinary use of diclofenac. In early 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 Wildlife Board meets every 18 months, and is attended by the Indian Prime Minister. On March 15th the Indian Prime Minister announced that the veterinary use of diclofenac will be phased out within six months. This news was recognised internationally as a very significant step forward for the conservation of vultures in Asia, and marks the key progress that this project has made over the last year. We are now working to encourage Pakistan and Nepal to follow India's lead.

The announcement in India is conditional on the need to find an alternative veterinary drug to replace diclofenac, as the use of this drug is economically important across rural India. The RSPB and the International Centre for Birds of Prey (ICBP) initiated a questionnaire survey on the clinical use of non-steroidal anti-inflammatory drugs (NSAIDs – the class of drugs which diclofenac belongs to) in vultures, raptors and other scavenging birds and mammals, which was sent out internationally to zoos, wildlife rehabilitation centres and to veterinarians. We have now received replies from over 30 institutions detailing the treatment and clinical outcome of NSAID use in over 400 individuals from more than 30 species. These results have enabled us to identity potential alternative drugs for safety testing, as well as indicate which NSAIDs cause similar renal damage as diclofenac.

Safety testing of an alternative drug is now well underway in South Africa in collaboration with the Faculty of Veterinary Science at the University of Pretoria. This testing is using the abundant and non-threatened African white-backed vulture (*G. africanus*) as a surrogate for the three critically endangered Asian *Gyps* vultures. Toxicity testing of diclofenac on this species and Eurasian griffon vultures (*G. fulvus*) indicates that they are at least as sensitive to diclofenac as the Asian vulture species (paper in prep). Toxicity testing was undertaken on non-releasable and non-breeding birds that could not be rehabilitated. To date over 30 wild and captive vultures have been treated with this alternative drug. All birds have survived and there is no clinical indication of any adverse reaction to the drug. The most recent stage of this safety testing (mid-April 2005) was undertaken in conjunction with a visit by Indian scientists from the Indian Veterinary Research Institute (IVRI) and BNHS, which was sponsored by the RSPB. The RSPB and Pretoria University are now working collaboratively with IVRI to replicate safety testing in India. Results of safety testing will be jointly published to ensure the international and Indian involvement in the trials and maximise acceptance of these results within India. The initial results of the safety testing will be reported and published in mid-August, in time to inform the Indian government one month prior to the planned timing of the diclofenac ban.

The vulture conservation breeding centre in Pinjore (Haryana State) is now fully completed, with two large flight aviaries, a breeding aviary, hospital and quarantine areas and dedicated staff including a veterinarian. The Pinjore facility now has the capacity for 100 pairs of vultures. The construction of this centre has provided a great deal of employment and support from the local community, with 20+ labourers working at the site over much of the last year. Due to political uncertainties in Nepal we requested that Darwin money for a centre there be transferred to BNHS for a new centre to be constructed in West Bengal State in northeast India. Land and leases for the centre are now complete and supported by the West Bengal State Government, and construction work is planned to start in May 2005. Two new veterinarians have recently been hired and are currently at the Pinjore centre so that they will be fully trained for the West Bengal centre.

This new centre is in areas of India and southern Nepal where populations of slender-billed vultures (perhaps the most threatened of the three critical species) historically occurred. Surveys of slender-billed vultures were undertaken in 2004 and are being repeated from March to May 2005. Small numbers of birds are still being

located. Surveys of slender-billed vultures in Nepal have not been possible due to Maoist activities in southern areas where birds formerly occurred.

Progress on satellite tracking has been hampered in India due to permit difficulties. We are planning to undertake satellite tracking in Nepal and to apply the results of tracking to in-situ conservation efforts by understanding the foraging behaviour and areas that need to be maintained free of diclofenac in order to protect vultures. This work will be carried out with community education projects in Nepal, as additional threats such as logging of nest trees have been identified. In support of this work we were recently awarded 3 satellite transmitters as part of the North Star Technology Annual awards (worth ca. £5000), which is open to conservation applications from throughout the world. A condition of this award is that tracking results are produced for the Earthspan Eye of Falcon website (www.eathspan.org.Education.htm), which is open to educational institutions in North America and the world. Hence this award will help further promote this project and research and conservation of Asia's vultures.

Recent discoveries of Oriental white-backed and slender-billed vultures in Cambodia and Myanmar indicate the potential for important populations of these species in this region. Investigating the size of these populations, determining (through satellite tracking) whether they are migratory or resident, and protecting these populations is a new priority for the project. We have now started a collaboration with the Wildlife Conservation Society-Cambodia and BirdLife International in Indochina to further develop work in this region, and the RSPB has committed four satellite tags to the research. An application for research in Southeast Asia to the Rufford Foundation was successful and we can now commit an additional £20,000 to the research in Cambodia and Myanmar.

Two full time vulture conservation and advocacy positions are now supported by the RSPB. These positions include staff based in the UK and India. The role of these two staff has been essential in lobbying National and State governments in India, and has enabled research and conservation efforts carried out by this project to be as focused as possible and able to report at the highest levels within India.

Significant difficulties

The major difficulty encountered has been the political uncertainty in Nepal, and due to concerns over the long-term viability of establishing a captive centre in this country we requested that this centre be constructed in northeast India. The political problems in Nepal have also hampered our efforts to undertake surveys for slender-billed vultures. The other difficulty encountered has been the often slow rate of progress on obtaining permission to capture vultures and move them across state boundaries in India. While we have good National Government support for the project, cooperation from state government and state institution officials is also required. The previously very supportive Chief Wildlife Warden in Haryana State has unfortunately been replaced with a less cooperative bureaucrat, which has hampered catching efforts for satellite tracking and captive breeding. We are working closely with the State and National governments to ensure his proper cooperation.

Timetable for the next year

May	Construction of new breeding centre in West Bengal underway
	Submission of manuscript on diclofenac toxicity to African white-backed and Eurasian griffon vultures
	Submission of manuscript on diclofenac kinetics in Indian cattle and prevalence of diclofenac residues in livestock carcasses in India
June	Last stage of NSAID safety testing completed in South Africa
	Capture of >40 white-backed and long-billed vulture chicks for centre

	Monitoring of vulture colonies in India and Nepal completed for 2004-05
	Submission of manuscript on population trends of Egyptian and King vultures in India
July	Initial NSAID safety testing trials completed in India
	Surveys of Himalayan griffon vultures undertaken in India and Nepal
	Submission on manuscript of population trends of vultures at breeding colonies monitored in India
August	Report to Indian government and publication submitted on safety of alternative NSAIDs to replace diclofenac
September	Completion of key buildings at breeding centre in West Bengal
October	Capture of vultures in Cambodia for satellite tracking and repeated monitoring work established
	Continuation of NSAID safety testing and studies in India
November	Capture of resident breeding vultures in Nepal and India for satellite tracking studies
	Vulture conservation and awareness program established within four communities in Nepal and concurrent vulture research and monitoring
December	Completion of NSAID safety testing and studies in India
January	Report and publication produced on NSAID safety testing results from India and further work in South Africa
February	Capture of vultures for breeding centres in Haryana and West Bengal
March	Capture of vultures for breeding centres in Haryana and West Bengal

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 2004-2005. No major difficulties have been encountered in these working relations, although the work undertaken with Todd Katzner (Imperial College London) has now ceased due to difficulties in capturing vultures there and Todd Katzner has changed jobs and is now based in the USA.

A large number of new partnerships have arisen over the last year in connection with this project. These include new collaborations in South East Asia with BirdLife International in Indochina, the Wildlife Conservation Society – Cambodia Programme, and World Wide Fund for Nature – Cambodia. Within India we have extended our partnerships and are now working with the Wildlife Institute of India and the Indian Veterinary Research Institute. Due to the need to undertake research on safe alternatives to diclofenac the project has been undertaking collaborative work in Southern Africa with the Faculty of Veterinary Science of the University of Pretoria, the Vulture Study Group of BirdLife South Africa, the DeWildt Cheetah and Wildlife Trust and with the Rare and Endangered Species Trust in Namibia.

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. The announcement of the phase out of diclofenac within India has resulted in an enormous amount of media interest. There has been national and local broadsheet and online news coverage of this news in India, and it has been widely reported on international news websites and in the conservation literature.

The implementation of the 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.

8. Post-Project Follow up Activities

N/A

9. Outputs, Outcomes and Dissemination

The amount of publicity and coverage that the vulture project has received has 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 and Nepal, due to difficulties obtaining permits, and the completion of surveys for slender-billed vultures in Nepal die to political instability in this country.

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 or in the process of being trained in vulture captive management and breeding
6B.3	3 weeks	Visits by Jemima Parry-Jones (ICBP), Nick Lindsey (ZSL) and Andrew Cunningham (ZSL) have provided training to staff at the vulture centre
8	30 weeks	Susanne Schultz (8 weeks), Richard Cuthbert (12 weeks), Debbie Pain (4 weeks), Andrew Cunningham (3 weeks), Rhys Green (1 week), Jemima Parry-Jones (2 weeks)
11A	2	Two peer reviewed papers (see Table 2).
11B	4	4 papers to be submitted on toxicity of diclofenac to African white-backed and Eurasian griffon vultures, on pharmacokinetics of diclofenac in Indian cattle and diclofenac residues in livestock carcasses, on results of NSAID safety on African white-backed and Asian vultures,

		and on the population trends of Egyptian and King vultures in India.
12A		A database on vulture numbers from colony monitoring in India will be established in the coming year, once the results from this monitoring are published in a scientific journal
14B	8	Talks and seminars given at the following meetings: British Ecological Society, Bombay Natural History Society Annual meeting, Full Department Meeting Conservation Science Department RSPB, Annual Research Seminar, Institute of Zoology, London, RSPB AGM, BirdFair UK, University of Cape Town, RSPB members group meetings, WWF India and Indian Veterinary Research Institute
15A 15B 15C	>30	Four press releases have been released by the RSPB in the last year Considerable publicity has resulted in the course of the year from the publication of scientific papers (particularly Green et al. 2004) and progress made with the recent diclofenac ban in India. A search on "Google" reveals over 500 results for a search on "diclofenac ban in India". Publicity includes the BBC's science online website, Asia Pacific News for the 1/10/2004, Yahoo new 1/10/2004, Medical News Today, BirdLife International 26/4/2005, BBC News South Asia 26/4/05, National Geographic News and news stories in the journal Science. Websites include: http://news.bbc.co.uk/1/hi/world/south_asia/3708078.stm http://www.channelnewsasia.com/stories/afp_asiapacific/view/109481/1/.html http://story.news.yahoo.com/news?tmpl=story&cid=1539&ncid=1539&e=7&u=/afp/20041001/sc_afp/environment_species_041001001013 http://www.medicalnewstoday.com/medicalnews.php?newsid=14326# www.birdlife.org/news/news/2005/03/**diclofenac**.html news.bbc.co.uk/2/hi/south_asia/4372783.stm news.bbc.co.uk/1/hi/sci/tech/3706346.stm news.nationalgeographic.com/news/2004/01/0128_040128_**india**vultures.html It has not been possible to keep track of the number of articles published on vultures in India, but vultures feature regularly (>25 times in the year) in both national and local papers.
17A	1	Project website is well established
18A 18B 18C	5+	Richard Cuthbert, Debbie Pain, Rhys Green and Vibhu Prakesh have all been interviewed for documentaries on vulture conservation in Asia
19B	3	UK publicity on vultures includes an interview with Rhys Green on BBC Radio 4 Today Programme (7:00 am on Friday 1st October 2004, and at 7:40 on BBC Asia network), and with Radio 5 live.

21	1	The captive breeding centre in Nepal has been moved to northeast India. Formal permission for lease of land in India are now approved and construction work will begin in May 2005
23	£230,000	Awarded 3 satellite transmitters from North Star Technology worth £5000 £20,000 from Rufford Foundation for work in Cambodia and Myanmar £55,000 from Global Opportunities Fund – Sustainable Development Programme, to support studies on economic costs of vulture declines and fund full time vulture advocacy position £100,000 contribution from RSPB, covering vulture advocacy work, captive breeding and NSAID safety testing work in South Africa £50,000 contribution from Zoological Society of London, for Captive Breeding Programmes in India

Table 2: Publications

Type	Detail	Publishers	Available from	Cost
Scientific article	Diclofenac poisoning is widespread in declining vulture populations across the Indian 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. (2004)	Biology Letters (2004), DOI: 0.1098/ rsbl.2004.0223	RSPB	£0
Scientific article	Diclofenac poisoning as a cause of vulture population declines across the Indian subcontinent. Green, R., Newton, I., Shultz, S., Cunningham, A., Gilbert, M., Pain, D.J., & Prakash, V. (2004)	Journal of Applied Ecology (2004), 41, 793–800	RSPB	£0
Species Recovery Plan	South Asian vulture recovery plan	RSPB	www.vulturerescue.org www.vulturedeclines.org	£0
Species Recovery Plan	Report of the International South Asian Vulture Recovery Plan Workshop	BUCEROS (BNHS) (2004), 9, 2-48	BNHS and RSPB	£0

10. Project Expenditure

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

Item	Budget	Expenditure	Balance

Project costs for rents, rates and overheads were higher than anticipated due to inflation of these costs in India, and because overhead costs applied by BNHS (15% of project costs) are higher than overhead costs applied by Bird Conservation Nepal (10%). Hence the transfer of funding for the captive breeding centre from Nepal to India raised the overhead costs of this part of the project.

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 every few months (as well as regularly discussing the project) to evaluate current progress, review deadlines, and set activities to be addressed in the next period.

The rapidly changing events of the past year have demanded flexibility and adaptive management for the project. As more information has become available about the role of diclofenac in the declines, we have re-evaluated our priority actions.

12. Outstanding achievements of the project during the last year

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The catastrophic decline of Asian vulture populations has driven concerted research efforts by several international groups over the previous five years. The identification by the Peregrine Fund of the veterinary drug diclofenac in Pakistan, and the confirmation by the RSPB and Bombay Natural History Society of the role of diclofenac in India and Nepal, were major steps forward in identifying the cause of the Asian vulture declines. Further work by this project has shown that only a very small proportion (<1%) of livestock carcasses need to contain lethal diclofenac residues to have driven vulture declines at the observed rate. Preliminary results from sampling carcasses across India indicate that there is more than enough diclofenac in the environment, and confirm that diclofenac is the main, if not the only, cause of the vulture population declines. International workshops for the conservation of vultures have recommended a ban on the veterinary use of diclofenac and the urgent establishment of captive breeding facilities for all three critically endangered species. A completed breeding centre with capacity for >100 pairs is now established in Haryana State in India, and work is underway on a new centre in West Bengal State in northeast India. Following extensive discussions and a report prepared by the RSPB and colleagues for a meeting of the Indian Wildlife Board Meeting, the Indian Prime Minister announced on the 15th March 2005 that diclofenac will be phased out within six months. This announcement is a tremendous step forward for the conservation of vultures in India and the surrounding region. The RSPB is now working in collaboration with veterinarians and scientists in India and South Africa, to provide a vulture safe alternative to diclofenac, to ensure that this drug can be replaced at the earliest possible opportunity.

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

Project summary	Measurable Indicators	Progress and Achievements April 2004-Mar 2005	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 Signed manifesto supporting the role of diclofenac in vulture declines	Commence priority activities from the final recovery plan document. Publish results on safety testing of alternative NSAID and ensure effect diclofenac ban within India and neighbouring countries
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 published and another in prep that covers the current rate of declines across India Collaboration established with Wildlife Conservation Society Cambodia, and BirdLife International Indochina to collate	Plan survey for Bangladesh Birds satellite tagged in Caucuses, Cambodia, Nepal and India Undertake surveys on Himalayan griffon vultures in India and Nepal

		information on Gyps populations across South East Asia. Satellite tags sent to partners in India and Cambodia	
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 and published that demonstrates small proportion of cattle needed to contain diclofenac to cause declines Sampling of livestock carcasses to quantify extent of diclofenac across India	Complete sampling of livestock carcasses and publish results Quantify extent of diclofenac and alternative safe NSAIDs in carcasses following introduction of diclofenac ban
Plan for the management of declines produced	Plans developed & produced collaboratively by participating organisations in the Gyps range states	Species recovery plan published and on vulture rescue website	Ensure recommendations from species recovery plan are undertaken by range states
Participants able to implement & monitor management plan	Staff from 4 countries trained in satellite tagging (Jordan, India, Nepal, Kazakhstan, Georgia?); Two databases developed; a serum bank established; email network created	Initial samples collected for serum bank including from African white-backed vultures Project staff and collaborative staff trained in capture and satellite tagging in India and Cambodia	Staff to be trained in Nepal in capture and satellite tracking Database on colony monitoring and NSAID questionnaire survey results to be published on website
Gyps population protected from declines	Captive breeding centre established. Staff trained in care and management of facility.	Permits and lease acquired for building centre and capturing vultures West Bengal.	Construction of centre in West Bengal 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	Website updated www.vulturerescue.org 8 presentations given. Two papers published, four papers in prep for submission. More than 30 news, website and radio articles published on diclofenac findings and diclofenac ban.	Four additional peer-reviewed papers to be published
Funding strategy developed	3 staff trained in fundraising, strategy agreed.	Funding raised internally through RSPB and ZSL, further funds obtained from Rufford Foundation and Global Opportunities Fund to support expanded captive breeding program, research in Southeast Asia and vulture advocacy and economic impact study	Additional funding to be raised to support the expanded vulture conservation programme within the partner organisations
Elimination of diclofenac as a threat to Asian vulture populations	Diclofenac removed from the veterinary marketplace. Livestock treated with safe alternative to diclofenac.	Indian Government announced ban on veterinary use of diclofenac within 6 months Safety testing underway in collaboration with South African Vulture Study Group and University of Pretoria, and in cooperation with the Indian Veterinary Research Institute and BNHS	Production of report for Indian government and scientific publication on safety of alternative NSAIDs Encourage and lobby neighbouring countries (Nepal, Pakistan and Bangladesh) to follow India's lead in banning diclofenac Extend research to understand mechanism of diclofenac poisoning and identify safety and toxicity of range of NSAIDs