

DARWIN INITIATIVE FOR THE SURVIVAL OF SPECIES : APPLICATION FOR GRANT FOR ROUND 9 COMPETITION

1. Name and address of organisation

INSTITUTE OF ZOOLOGY, ZOOLOGICAL SOCIETY OF LONDON

2. Principals in project

Details	Project leader	Other UK personnel (if working more than 50% on project)*	Main project partner or co-ordinator in host country
Surname	Cunningham	Pain	Rahmani
Forename(s)	Andrew	Deborah	Asad
Post held	Veterinary pathologist	Head of International Research	Director
Institution (if different to the above)		RSPB	Bombay Natural History Society (BNHS)
Department	Institute of Zoology	Conservation Science	
Telephone			
Fax			
Email			

* Although not working >50% on this project, named personnel will have an ongoing input throughout the project. CVs are attached.

3. Project title (not exceeding 10 words)

Conservation of Critically Endangered *Gyps spp.* Vultures in India

4. Abstract of study (in no more than 750 characters)

Two vulture species of the genus *Gyps* have declined by more than 90% in less than 10 years in India, probably due to infectious disease; now both are classified as 'Critical' (IUCN). The problem is spreading west through Pakistan and could also have severe ecological and human consequences throughout Europe and Africa. It is essential that the cause of decline is identified rapidly, and that action is taken to remedy the situation within India. UK experts in avian diagnostics (Institute of Zoology), avian research and monitoring (RSPB) and care of endangered species (National Bird of Prey Centre) will train, act as consultants, and collaborate with Indian scientists from Bombay Natural History Society, the Indian Bird Conservation Network and the Poultry Diagnostic Research Centre to help identify the cause of decline, to facilitate the production of a recovery plan, and to develop the capacity to implement the plan.

5. Timing. Give the proposed starting date and duration of the project.

1 April 2001, three years

6. Describe briefly the aims, activities and achievements of your organisation. (Please note that this should describe your unit, institute or department within a university.)

Aims

The mission of the Institute of Zoology is ***To identify, undertake, and communicate high-quality biological research which benefits the conservation of animal species and their habitats.*** This mission is pursued through three complementary objectives: 1) *To undertake relevant, high-quality biological research,* 2) *To respond to research priorities identified by conservation practitioners,* and 3) *To communicate significant outcomes and results to the scientists, conservation practitioners and the wider community.*

The Institute of Zoology is the research arm of the Zoological Society of London (registered charity number: 208728) which has a mission to ***To achieve and promote the world-wide conservation of animals and their habitats.*** The ZSL runs two zoos, at London and Whipsnade, and undertakes field conservation projects overseas

Activities

The Institute of Zoology is funded through the Higher Education Funding Council for England (HEFCE). The University of Cambridge is our academic partner and the activities of the Institute are managed through a joint committee from the University of Cambridge and the Zoological Society of London.

Our activities are as follows: 1) Research on fundamental and applied aspects of whole organism biology, emphasizing topics in: Animal health & welfare, Reproductive biology, Genetic variation, fitness and adaptability, Behavioural ecology, Population dynamics and community ecology, Wildlife epidemiology, Biodiversity and macroecology; 2) Regular programme of research seminars, and training and technology transfer through MSc and PhD training programmes.

Achievements

The Institute of Zoology has become recognised as a leading international centre for conservation biology science and action. In the last two years significant achievements have included (1) contributions to the understanding of processes that generate and maintain biodiversity, including the roles of speciation and population differentiation and the significance of genetic diversification for threatened population management, 2) methods for priority-setting for conservation in both area- and species-based analyses, including the technical work underlying the IUCN Red List categories, 3) contributions to understanding complex population dynamics and their implications for population management for conservation, including individual-based behavioural models, population viability analyses and analyses of population synchrony in taxa ranging from invertebrates to elephants, 4) elucidation of the role of infectious diseases in biodiversity conservation, especially the co-discovery of a novel fungal disease pandemic as the cause of amphibian declines on a global scale, publication of the first report of a species extinction (*Partula turgida*) due to infectious disease, and the discovery and description of a new viral epidemic disease of frogs in Britain, and 5) novel techniques for non-invasive monitoring of fertility and inbreeding effects in threatened species. This work has been published in leading international journals (including *Nature*, *Proceedings of the Royal Society of London*, *Science*, *Proceeding of the National Academy of Science*, *Ecology* and *Conservation Biology*).

Currently two journals (*Animal Conservation* and *Journal of Zoology*) are published in collaboration with the Zoological Society of London and Cambridge University Press. *Animal Conservation* is a rapid publication journal with papers on significant scientific aspects of species conservation, and although only launched in 1998, the journal is growing in terms of both subscriptions and submitted papers. With the ZSL we also hold organise weekly talks and meetings for scientists, conservation practitioners and the general public. In addition an annual two-day symposium of some topic in conservation biology has regularly attracted high-level international participation. The last two in this series ('Carnivore conservation' and 'Conservation of Exploited Species') attracted over 200 students and researchers, and both are being published as edited books by Cambridge University Press. Our book series in Conservation Biology, produced in partnership with Cambridge University Press since 1998 now includes 7 titles with several more in the planning phase. These books arise from the symposia but may also come directly from interested authors or be commissioned by the series editors.

7. Has your organisation received funding under the Initiative before? If so, please give details.

The Institute of Zoology has received previous funding as follows: (1) 'Patterns of diversity in Ugandan forests (Dr Andrew Balmford, 1994-1997), (2) 'Vicuna and guanaco conservation and genetic resource management' (Dr Helen Stanley, 1997-2000), and (3) Development of a research and monitoring unit at Garamba, D.R. Congo) (Dr Guy Cowlshaw, 2000-2003)

8. Which overseas institutions, if any, will be involved in the project? Please explain the responsibilities of these institutions.

Bombay Natural History Society

The BNHS is the largest Non-Governmental conservation agency in the Indian subcontinent and has been involved in conservation and research for the last 115 years. BNHS scientists work in protected and other sensitive natural areas of national and international significance for biodiversity. This work contributes crucial data for the management and conservation of India's rich and threatened biodiversity. BNHS is closely involved with the development of conservation legislation in India (e.g. Wildlife Protection Act 1972). It also runs a Conservation Education Centre that provides education throughout India using mobile units, as well as producing many natural history publications. BNHS is a post-graduate department of the University of Bombay. The Society maintains the largest collection of animal specimens, and library in India. The BNHS co-ordinates the activities of the Indian Bird Conservation Network (IBCN) throughout the country.

Dr Asad Rahmani (Director of BNHS) – has published more than 75 research papers, nearly 50 research notes and reviews and 300 popular articles. He has supervised 4 PhD students. He has run 8 major and many minor projects on wildlife over the past 20 years. His main current research interests include studies on Indian bustard, storks, antelopes and grassland and desert ecosystems.

The BNHS is the main project partner in this proposal. They will be responsible for overseeing and co-ordinating all of the work within India, and BNHS staff will conduct the sample collection, monitoring and ecological data collection, along with the management of the captive care facility at Bharatpur (see 13, outputs; 19, logframe).

Poultry Diagnostic and Research Centre

The PDRC is a non-profit making unit of Venkateshwara hatcheries Ltd. It was established as a Poultry Disease Diagnostic unit in 1980, and in 1985 the facility was upgraded to a sophisticated Poultry Diagnostic Research Centre. The PDRC's remit does not only cover Venkateshwara Hatcheries Group poultry farmers, but, through its six satellite laboratories, the activities of which are co-ordinated through PDRC, provides a service to poultry farmers the length and breadth of the country. PDRC's main activities are research and investigation of avian diseases, including a nation-wide epidemic surveillance programme. Research activities include work on emerging subclinical and clinical stages of diseases, and transmission of viral and bacterial diseases including immunosuppressor conditions caused by viral pathogens. PDRC facilities include a 5000 sq. ft. sterile area with positive and negative air handling system. for the production of diagnostic reagents and autogenous killed vaccines for poultry diseases.

Disease research at PDRC includes the use of Specific Pathogen Free (SPF) eggs produced by Venkateshwara hatcheries Ltd, one of only a few organisations in the world to produce SPF eggs. SPF eggs are fertile chicken eggs from known SPF parent flocks. The eggs are free from vertically transmitted agents (such as avian adenovirus, avian encephalomyelitis virus etc.) and from laterally transmitted infections (such as Newcastle disease, infectious bronchitis, avian influenza.). SPF eggs are used for a variety of purposes, including investigation of the epidemiology of avian and human diseases, e.g. isolation and characterisation of infectious agents. Use of SPF eggs will play an essential part in identifying the cause of any disease factor responsible for the vulture declines.

Dr G. R. Ghalsasi is a specialist in avian diagnostics and has been General Manager of PDRC for 21 years, currently overseeing a staff of 30.

The PDRC will be responsible for post-mortem and diagnostic work necessary to identify the cause of the vulture declines (see 19, Logframe - output 1.)

PROJECT DETAILS

9. Define the purpose (main objective) of the project in line with the logical framework.

The longer-term goal to which this project contributes is to assist Indian scientists to prevent the extinction of critically endangered bird species.

Specifically, the purpose of this project is to produce a Recovery Plan for the critically endangered *Gyps spp.* vultures (*Gyps indicus* and *Gyps bengalensis*) in India and to develop the capacity to implement it.

10. Is this a new project or the continuation of an existing one?

New project

11. What is the evidence for a demand or need for the work? How is the project related to conservation priorities in the host country(ies)? How would the project assist the host country with its obligations under the Biodiversity Convention?

How was the work identified?

Populations of two vulture species in India, which holds the majority of the world populations, have crashed. Indian white-backed *Gyps bengalensis* and long-billed *G. indicus* vultures, common and widespread in the 1980s, have been classified by IUCN as **critical** since October 2000. At Keoladeo National Park World Heritage Site (KNP), Rajasthan, populations of both species underwent declines of > 90% between 1987/88 and 1997/98. Recent surveys by Bombay Natural History Society show these severe declines to be nationwide; there are recent reports of declines in *Gyps* spp. in neighboring Nepal and Pakistan. Abnormally high rates of nest failure and of adult, juvenile and nestling mortality have been noted in areas of declines. Work by BNHS has shown that the declines are not related to food shortage, and toxicological examinations suggest that pesticide poisoning is unlikely. Preliminary epidemiological and pathological data (IoZ and PDRC) point to an infectious disease, possibly caused by a virus, as the cause of the declines. For example, clinically sick vultures (lethargic with intermittent, prolonged, periods of head drooping) are commonly observed. These birds die after 30 to 32 days of illness.

Identifying the cause(s) of population declines of *Gyps* spp. vultures in India is one of the most urgent priorities facing the research and conservation community today. The potential impacts of vulture extinctions within India, and across Europe and Africa should the presumed disease spread, would severely disrupt the ecosystems for which vultures are the main scavengers, and could have devastating effects on associated human populations.

The situation was reviewed by Indian and International experts at an 'International Meeting on the Vulture Situation in India' held in Delhi, 18-20 September 2000, organised by BNHS and supported by RSPB and the Ministry of Environment and Forests, Government of India. The participants agreed the following statement

Statement of the participants of the meeting on the Vulture Situation in India, Delhi, 18 - 20 September 2000

- 1) Recognising that the populations of India's two most common vultures, White-backed Vulture and Long-billed Vulture, have drastically declined, in many places up to 90% in India
- 2) Further concerned that the decline may be affecting other Indian Vultures of the genus *Gyps*
- 3) Noting that vultures play a vital role in Indian eco-systems and therefore in the welfare of livestock and human populations
- 4) Notwithstanding the Indian initiatives in the investigations into the causes of vulture decline, further work is needed urgently to determine the causative factors responsible for the decline
- 5) The participants of the International Seminar on the vulture situation in India, urge the Government of India to support the Vulture Recovery Action Plan:
 - Grant permission for and support the collection of dead, sick and healthy vultures for the purpose of taking samples for analysis
 - Grant permission for and support the establishment of a captive population of vultures as an insurance against possible extinction and as a resource for research and potential captive breeding

At this meeting, the government expressed commitment to supporting this work, which indicates the importance that the government attaches to this problem.

This proposal is to support BNHS to take a lead in implementation of the actions urgently recommended by the meeting, which are to identify the cause of the declines through the analysis of vulture tissues, and to develop the capacity for holding a captive population for research and potentially captive breeding.

How is the project related to conservation priorities in the host country?

As a result of the recent surveys conducted by the BNHS, *Gyps indicus* and *G. bengalensis* are now classified as critically endangered, placing them amongst the 7 most endangered of India's 76 globally threatened bird species. As such they are of primary conservation importance both within India and globally. The Ministry of Environment and Forests, government of India recently co-funded an international meeting to discuss this problem (described above), indicating the importance that they attach to this work. In addition, the Environment Secretary for India has recently expressed concern over the status and ongoing rapid decline of these species.

How will the project assist the host country meet its obligations under the Biodiversity Convention?

The proposed project is designed to assist with obligations under the Biodiversity Convention by (1) research to identify the cause(s) of decline of these species; (2) monitoring to determine geographical extent and rate of declines across India; (3) to provide training to key Indian scientists in diagnostic and health monitoring techniques and the collection, storage and dissemination of monitoring and other ecological data; (4) development of a recovery plan for *Gyps. spp.* based on data collected during the period of the project and centred around the Keoladeo National Park World Heritage Site; (5) training and capacity building to enable key Indian scientists to implement conservation measures for these species.

The Indian government is implementing a two year Global Environment Facility project to develop a National Biodiversity Strategy and Action plan. This project will contribute to the thematic area on wild animal biodiversity which will identify critical species and make recommendations for their conservation. This project will provide vital information for the vulture species involved, and provide a model process for development of species recovery plans which will be available to government and other agencies implementing the plan.

12 In what ways can this project be considered a Darwin project? How does the project relate to the Darwin principles? How would the project be advertised as a Darwin project and in what ways would the Darwin name and logo be used?

The objective of this project is to produce a recovery plan for critically endangered *Gyps spp.* vultures in India, and to develop the capacity to implement the plan. A key component of this will be conducting the research necessary to determine the cause of the declines.

The proposed project is a Darwin project because it aims to prevent the extinction of two critically endangered bird species (White-backed and Long-billed vultures) by undertaking research, monitoring and training designed to produce a long-term strategy to secure their future. It is clearly related to the Darwin principles as it is designed to assist conservation agencies in India, a country rich in threatened biodiversity (e.g. 76 globally threatened bird species), with the conservation of its biodiversity, and with obligations it has under the Biodiversity Convention. White-backed and Long-billed vultures are two of the 7 most threatened bird species in India, and are thus of global conservation importance. The proposed work will help build upon the resource base already established within India, and enable Indian scientists to fully address the scale of the present crisis.

The proposed project would be collaborative, bringing together staff of the Bombay Natural History Society (BNHS) and the Poultry Diagnostic and Research Centre (PDRC), with British scientists who have extensive skills and experience of research within the fields of wildlife pathology (IoZ), bird conservation (RSPB) and endangered species management (NBPC, RSPB, IoZ) (see attached CVs in Annex 1). The project is designed to have real impact on conservation by ensuring that the results of research and monitoring work generate conservation action by producing a recovery plan, training key staff in India, providing technical support (sample and data storage, analysis and interpretation), and raising awareness of one of the most pressing conservation issues in India at this time (This could potentially also become one of the most pressing biodiversity conservation issues throughout the whole range of *Gyps spp.* vultures in Europe and Africa).

The recent declines in vulture populations are increasingly attracting media attention in India and the UK. For example, a recent BNHS questionnaire on vulture declines in India elicited 2000 responses, and the issue has been publicised in the UK Times and Observer newspapers, in Science, twice in New Scientist and several times on the BBC World Service. A radio 4 programme 'Costing the Earth' also covered this problem on 19th October. To raise public awareness of conservation issues involving *Gyps spp.* vultures, we intend to publicise the research project widely while it is in progress. This promotion would be designed to maintain government support for the work, and encourage people to take an interest in what was being done and why. All publicity will include the fact that the project was funded by the Darwin Initiative (including name and logo). An important part of the training element of the project (see section 2.7) is workshops to transfer key skills (in avian diagnostics, monitoring and ecological data collection, and captive care). These workshops would be promoted as Darwin workshops, using the name and logo of the initiative. A number of publications, including a final report, recovery plan, scientific papers, and articles for the popular science press are planned as part of the project, and would acknowledge the support of Darwin, and, where possible, bear the Darwin name and logo.

13. Set out the proposed timetable for the work, including the programme's measurable outputs using the attached list of output measures.

Task	Aims	Outputs	Year			Notes
			2001/2	2002/3	2003/4	
Research and Monitoring	Identify the causes, extent and rate of decline of <i>Gyps. spp.</i>	8	9	9	8	*See footnote 1
Recovery plan	Produce recovery plan detailing conservation action and monitoring strategy	9			1	As well as detailing what conservation measures are required, and detailing a strategy for delivering these, the plan will also be widely circulated to publicise the research and its significance.
		10	1			Census and Survey guide produced as output from workshop
		11A		1	2	This includes the 3 papers under 11A.. Popular scientific articles will also be published.
		11B		2	3	
		12A	2			Population monitoring and pathology databases
Training	Training BNHS scientist in the UK in captive care of vultures, diagnostic and health monitoring techniques and ecological data collection.	6A.1	1	1	1	*See footnote 2
	Training BNHS and IBCN staff in India in monitoring techniques and ecological data collection.	6A.2	20	*	*	Training in 2001 will involve a census and survey workshop and training in carcass collection and submission and ecological data collection.. *See footnote 2 *See footnote 3
	Training in India for BNHS staff in captive care and basic pathology investigations.	6A.3		3	3	
	Training workshop in captive care for a range of conservation and other organisations that will participate in recovery plan actions.	6A.4		10		
	Consultative training to PDRC staff	6A.5	3	3		
	Training at NBPC, IoZ and other institutes	6B.1	12	12	12	
		6B.2	1	*	*	*see footnote 2
		6B.3		3	3	Some staff may be trained in more than one year.
		6B.4		1		
		6B.5	6	4		
		7	1			
		14A			1	This will take place during the recovery plan workshop - see output '9' above

Task	Aims	Outputs	Year			Notes
			2001/2	2002/3	2003/4	
Dissemination outputs		14B	1	2	3	
		15A				6 national press releases
		15B				12 local press releases
		15C	1	1	1	
		16A	1	1	1	
		16B	200	200	200	In years 2001-2003 an annual newsletter will be produced for participating organisations and will also be accessible globally on a website. In 2004 a newsletter summarising key findings and actions from the recovery plan will be widely circulated.
Information will also be incorporated in various user group sites such as vulture news, and to key organisations including government and NGOs in Europe, Asia and Africa, where there are Gyps species potentially at risk.						
		17B	1	1	1	The IBCN will be enhanced throughout the duration of the project
		18A			2	Radio and television coverage of the project is planned but not confirmed.
		18B			1	
		18C		1	1	
		19A	2	2	2	
		19B	1		2	
		19C	4	4	4	
		19D	1			
Physical outputs		20			BNHS	Captive care centre and associated laboratory will be established at Bharatpur.
					£	
					£	PDRC: 2 liquid nitrogen containers, Laminar flow air cabinets ultra low temperature deep-freeze
		21			BNHS	Captive care centre and associated laboratory will be established at Bharatpur.
					1	
Financial outputs		23				A total of £ will be provided from all other sources, including contributions in kind. These have been itemised and quantified in sections 22 and 23.

- *1. Most of the time spent in India by UK researchers will involve training elements of the project, either to support data collection and recovery plan production as part of the proposed project, or to run training workshops.
- *2. All trainees will be Indian nationals. All trainees will be trained as trainers to enable these skills to be disseminated in a cascade fashion throughout India.
- *3. IBCN (Indian Bird Conservation Network). Partners from most regions of India will be trained in vulture and other bird census and survey techniques. Training in vulture carcass collection and submission protocols will also be given.

14. Do you know of any other individual/organisation carrying out similar work? Give the details of the work, explaining the similarities and differences.

No organisations are involved in similar work in India. However, the US Geological Survey (Fish and Wildlife Service) and Peregrine Fund have funded preliminary vulture surveys in Pakistan and Nepal, as the problem appears to be spreading westwards.

15. Will the project include training and development? Please indicate how many trainees will be involved, from which countries and what will be the criteria for selection. How will you measure the effectiveness of the training and will those trained then be able to train others? Where appropriate give the length of any training course.

The objectives of the training element of the project are to: (1) train BNHS staff and IBCN (Indian Bird Conservation Network) partners in monitoring techniques and ecological data collection to empower a nation-wide constituency of field biologists to assess and continue to monitor the status of vultures and other species (2) to provide in-country specialist consultation and advice (at PDRC) in specific pathology diagnostic techniques to enable the rapid identification of the infectious disease agent (3) to provide detailed training to a permanent, senior, staff member of BNHS staff in basic diagnostic and health monitoring techniques (e.g. haematology.) and the care of captive vultures (and other species). This staff member will be trained as a trainer and will train staff of the Vulture Captive Care Centre and Field Laboratory at Bharatpur.

This project will develop and strengthen existing links between BNHS and specialist diagnostic laboratories (e.g. PDRC) where specialist functions such as advanced diagnostic methods for avian diseases can be performed.

The training therefore has a short-term element which will facilitate the rapid identification of the infectious disease agent (or other cause of decline), and a long-term element which involves training Indian scientists to act as trainers in basic wildlife pathology and captive care, and in monitoring techniques and ecological data collection. This will be essential in order to implement the species recovery plan and monitor its progress.

Vulture Monitoring (6A.2, 6B.2): Training of 20 BNHS and IBCN partners in monitoring techniques and ecological data collection will be provided through a 1 week training course during year 1. Trainees will be selected from BNHS field projects and active IBCN partners, and will be representative of all the states where Gyps vultures occur. Those trained will train others in their regions. The effectiveness of this training will be measured through the results of annual vulture monitoring and the quality of additional ecological data collected, and through the production of reports.

Captive Care (6A.3, 6B.3): 3 weeks of training in India for 3 BNHS staff in each of years 2 and 3.

Vulture Conservation, captive care and basic pathology: 1 week of training in year 2 for 10 people (including 3 BNHS staff) delivered in India by NBPC and IoZ staff

Disease diagnostic work (6A.5, 6B.5): The project co-ordinator Andrew Cunningham will spend 6 weeks in year 1 and 4 weeks in year 2 as a consultant at the PDRC. 3 staff will be trained and evaluation will be through weekly work reports and the success of the project in identifying the cause of decline.

Workshops: Three workshops will be conducted. (1) In monitoring techniques and ecological data collection as described above (20 people), (2) a one week training workshop in pathology investigations (10 people) and (3) a recovery plan workshop (1 week) involving 5 UK specialists (captive breeding, wildlife pathology, population biology, etc.), and training a minimum of 10 people in the recovery planning process.

Training visits to the UK (6A.1, 6B.1): One senior scientist will receive 9 months training in the captive care of vultures, captive breeding techniques and wildlife health monitoring/disease investigation techniques at a range of Institutes in the UK, including the Institute of Zoology (IoZ) and the National Birds of Prey Centre (NBPC). This training will be spread over a 3-year period. The scientist will be trained as a trainer and will pass on this expertise to staff at the Vulture Captive Care Centre and Field Laboratory, Bharatpur to enable them to help in the implementation of the recovery plan. The success of this training will be measured by the ability of the staff member to train others within India, and this will be evaluated during workshops within India, at which IoZ, NBPC and RSPB consultants are present.

16. How will trainee outcomes/destinations be monitored after the end of the training?

The outcome of training will be assessed during annual supervisory and training visits to India and during the visits to the UK for the BNHS staff member involved in pathology and ecological research. In addition, UK staff will be in regular contact with BNHS staff, allowing the application of training to be monitored and modified as the project proceeds. Training outcomes for people attending workshops will be assessed during workshops using simple exercises.

In the longer-term, the majority of trainees will be directly involved in bird conservation as part of their work at BNHS and for the IBCN. Consultancy and advice to specialist staff from PDRC will enable the rapid identification of the causative agent. This means that the training will be targeted towards people who are in a position to apply the training directly in their work.

BNHS and IBCN partners already work in close collaboration on a range of bird conservation issues throughout India. This project will strengthen existing links and help to develop new links with other specialist organisations such as PDRC. In addition, the main UK staff involved from the IoZ and the RSPB intend to maintain an active future role, mainly in an advisory capacity. It is also anticipated that the other UK specialists involved in the recovery planning process will develop longer-term links with BNHS and other Indian Scientists. These links provide a mechanism that can deliver technical support to local staff involved in the training programme after the completion of the proposed project. This will be essential as this project aims to identify the cause of vulture declines, develop a recovery plan and much of the capacity required to implement the recovery plan. However, most of the implementation will take place after the end of this project.

The main outcomes of this project will be identification of the cause of declines, production of a recovery plan, and development of the capacity to implement the recovery plan. No implementation is possible until the cause of decline has been identified.

17. How is the work of the project expected to continue after the end of grant period? A clear exit strategy must be included.

At the end of the project the cause of the decline will have been identified, captive population facilities and lab set up with trained BNHS staff, and a vulture monitoring network will have been established. The next steps will have been agreed in a vulture recovery plan developed in consultation with government and key agencies in India (including the Parsi's, for whom vultures are an integral part of their funeral rites) which will have wide endorsement. Significant national and international interest and support for action will have been generated through the scientific and popular media. BNHS, IoZ and RSPB will have agreed a clear strategy for raising the additional resources needed.

Building on the work of the project towards the overall goal of recovery of vulture populations will involve the implementation of the recovery plan. This will require the following after the completion of this project:

- leadership and commitment of staff time from BNHS: the vulture decline was identified by BNHS, and they have lead efforts in India to work on it. They have a strong commitment to the development and implementation of the action plan and are recognised as the leading authorities on the issue by other players (including government) in India. BNHS will require additional resources to deliver this work
- continued voluntary commitment of IBCN vulture monitors: BNHS has a long term commitment to building the capacity of IBCN members to deliver bird conservation priorities in India. Vulture monitoring will remain one of these activities at minimal cost (simple communications only).
- on-going technical advice from IoZ, NBPC (probably at a low level depending on the nature of the work): individual links (e.g. through email) set up between these institutions and BNHS during the project will continue to work at minimal cost. Further technical backstopping will be identified in the recovery plan and will require additional resources.
- on-going technical advice from RSPB: RSPB has a long term commitment (through BirdLife International) to collaboration with BNHS on priority projects in India. RSPB expertise will be available through this arrangement at no additional cost. Significant additional RSPB time (depending on the actions needed) will require additional resources.

The increasing importance attached to this issue, BNHS' record of fund-raising and collaboration to date, and the broad range of agencies involved in this project, makes it certain that further funds required for implementation on the action plan will be raised. Additional resources may come from the Indian government (several BNHS projects are already government funded and BNHS has a strong record in securing government funding for its priority work), from proposals to donor agencies (probably in collaboration with RSPB), from support from other partners in the BirdLife International network, or from corporate or private sponsors with an interest in the issue (most obviously the wealthy Parsi business community).

MONITORING AND EVALUATION

18. Describe how progress on the project would be monitored and evaluated in terms of achieving its aims and objectives, both during the lifetime of the project and at its conclusion. How would you ensure that it achieves value for money? What arrangements will be made for disseminating results? If applicable, how would you seek the views of clients/customers?

Monitoring and Evaluation

Monitoring during the lifetime of the project will be carried out by visiting experts and by the RSPB International Officer who manages RSPB - BNHS collaboration. Monitoring will gather the information needed to measure the indicators detailed in the logframe, as well as highlighting lessons and problems. Monitoring information will be available in the form of project progress reports (produced by IoZ in consultation with BNHS), mission reports from visiting experts, and training course and workshop reports.

Specific supervisory visits by appropriate experts from UK will ensure that major elements of the project (e.g. captive holding facility, wildlife laboratory, pathology work, surveys, recovery plan) and associated training, are delivered on time and to an appropriate standard.

An end of project report will be compiled by IoZ in consultation with BNHS, PDRC and visiting experts, and will address the results of the project overall.

Periodic (probably annual) review meetings will be held between IoZ and BNHS in consultation with RSPB, PDRC, NBPC, to review progress against objectives, draw lessons from experiences and agree changes in the workplan and budget.

The monitoring of training is detailed in section 16

Value for Money

- The financial management of the project will be by BNHS in India (BNHS has a professional project finance team in place), with the quality of the financial management overseen by the finance department at IoZ. Stringent reporting and auditing requirements will be agreed in line with Darwin requirements, and IoZ and BNHS procedures (including independent annual Audit of BNHS accounts)

- Capital equipment will be procured in UK or India after comparison of prices and technical specifications

- local expertise and suppliers will be used wherever possible

- much of the vulture monitoring time will be delivered through the IBCN voluntary network.

Dissemination Arrangements

Dissemination outputs are specified in section 13. Capacity and mechanisms for dissemination are dealt with here.

- scientific papers: will be co-authored, as appropriate, by scientists at BNHS, PDRC, IoZ and RSPB, and submitted to international journals in the usual way.

- newsletters, press releases and electronic media publicity in India: BNHS has an experienced team of publications, editorial and public relations staff who will handle this aspect of dissemination in India. BNHS has a website which will carry news of the project.

- newsletters, press releases and electronic media publicity in UK and globally: RSPB and IoZ have experienced press offices and publications departments who will support dissemination globally.

Awareness in the international conservation community: RSPB and BNHS are linked with BirdLife International and other contacts in the conservation world and will be strengthening contacts in Gyps vulture range states to form an informal 'vulture email group'. Links have been established with the world Working Group on Birds of Prey, Vulture Study Group, Raptor Research Foundation.

NBPC has close links with UK and global zoo and captive breeding specialists and will promote the work through these newsletters and publications.

IoZ/RSPB/NBPC/BNHS have existing links with statutory authorities responsible for regulating the movement of birds (e.g. CITES, UK DETR, Indian MoEF) and will use these to ensure that the agencies are aware of the results of the project and of the potential risk of transporting the disease in captive birds.

19. Logical framework. Please enter the details of your project onto the matrix using the note at Annex B of the Guidance Note.

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal</p> <p>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention.</p>	<p>Gyps vulture populations removed from the Red Data Book</p> <p>Indian government and other agencies adopt this model of consensus building and recovery-planning for implementation of the NBSAP</p>	<p>Long term monitoring (post-project) and status review by IUCN/BirdLife</p> <p>Indian National reports to the CBD</p>	
<p>Purpose</p> <p>Recovery Plan for the critically endangered <i>Gyps spp.</i> vultures (<i>Gyps indicus</i> and <i>Gyps bengalensis</i>) in India produced and capacity to implement it developed.</p>	<p>PP1: Recovery Plan produced and endorsed by government and key Indian institutions</p> <p>PP2: Implementation of lab work, captive population management and field research judged to be self-supporting by the end of the project</p>	<p>PP1: Recovery Plan document and correspondence</p> <p>PP2: End of project report</p>	
<p>Outputs</p> <p>1. Cause of vulture decline identified</p> <p>2. Geographical extent and rate of vulture decline confirmed</p> <p>3. Options for remedial measures identified and evaluated.</p> <p>4. Capacity to implement and monitor species recovery plan developed.</p> <p>5. Constituency in support of vulture conservation in India developed in India and Internationally</p>	<p>1. International scientific community endorses the results of the project investigation</p> <p>2. Three years of comparable data available from 50% of Indian Gyps range states</p> <p>3. Consensus amongst key experts on possible remedial measures</p> <p>4. Training needs fulfilled and facilities operational</p> <p>5. Media and government interest in the issue sustained</p>	<p>1. Publication of results in peer-reviewed international scientific journals.</p> <p>2. Annual survey reports and publication of results in peer-reviewed international scientific journals.</p> <p>3. Meeting reports</p> <p>4. Pre-project training needs assessment and analysis of equipment needs, annual reports and training reports</p> <p>5. Media reports file at BNHS, correspondence with state and national governments and international bodies</p>	<p>Continued State and Federal government support for the collection of vulture samples.*</p> <p>It is possible to identify the cause of the decline before vultures become extinct.*</p> <p>That remedial measures are possible.*</p>

Project summary	Measurable indicators	Means of verification	Important assumptions	
Activities				
1.1 Establish collaborative relationships with appropriate institutions within and outside India	1.1 MoU between BNHS, IoZ, RSPB, PDRC and other relevant institutions	1.1 MoU on file at BNHS	Land available from government for captive holding facility/laboratory*	
1.2 Provide training in sample collection	1.2 20 BNHS staff trained (1 week)	1.2 training reports		
1.3 Provide specialist consultations in disease investigations at PDRC.	1.3 3 PDRC staff trained (10 weeks)	1.3 PDRC Lab reports		
1.4 Collect vulture carcasses from at least 3 states	1.4 at least 30 carcasses received by PDRC from at least three states in west, central and east India	1.4 PDRC Lab reports		
1.5 Conduct pathological investigations including: post mortem, bacteriology, histopathology, virology, etc.	1.5 results of each p.m. and investigations included in weekly work reports	1.5 Weekly PDRC work reports, reports from other labs		
1.6 Establish pathology database	1.6 database with records of all known analysis of vulture carcasses established at BNHS	1.6 electronic and hard copy versions of database at BNHS		
2.1 Run training workshops for vulture surveyors (IBCN partners and BNHS staff)	2.1 20 IBCN partners/BNHS staff trained to act as focal points for census and survey	2.1 training reports, correspondence with focal points		
2.2 Monitor vulture numbers, adult/juvenile ratios, and proportions of sick birds annually	2.2 information on vulture populations, food availability, signs of sickness etc. collected using standard repeatable methods	2.2 annual survey reports, website and database		
2.3 Establish vulture population database	2.3 database with records of all available vulture counts	2.3 electronic and hard copy records, maps, at BNHS		
3.1 Carry out literature review and consultations with experts inside and outside India	3.1 relevant experiences with other wild populations evaluated	3.1 review papers and discussion document		
3.2 Run recovery planning workshop with appropriate Indian and international expertise	3.2 Recovery plan approach agreed and all necessary information available to write it	3.2 workshop document and communiqué		
3.3 Write species recovery plan	3.3 Plan produced under auspices of BNHS and Govt of India	3.3 Plan document		
Project summary	Measurable indicators	Means of verification		Important assumptions
Activities (continued)				

4.1 Wildlife laboratory established and equipped at Bharatpur	4.1 Lab equipped to carry out analyses including haematology, veterinary care, etc.	4.1 Final report	
4.2 Establish Vulture aviaries at Bharatpur.	4.2 Facility for the maintenance of 20 captive vultures established	4.2 Final report	
4.3 One BNHS scientist trained in the UK to a high level in captive care techniques, and diagnostic and health monitoring techniques	4.3 One BNHS scientist spends 9 months over 3 years in UK at IoZ, NBPC and other specialist institutions	4.3 Final report	
5.1 Produce annual newsletter for participating/interested organisations	5.1 4 newsletters produced and 200 hard copies circulated in India, 50 UK/other, email circulation	5.1 newsletters, distribution lists	
5.2 provide up-dated information to the public through mass-media and popular scientific articles	5.2 6 press releases in India, 4 national and 4 local in UK	5.2 newspaper clipping files at BNHS	
5.3 up-date BNHS and RSPB website	5.3 newsletters available on BNHS and RSPB websites	5.3 website	
5.4 submit five papers to peer-reviewed journals	5.4 at least 5 submitted of which 3 accepted for publication by the end of project	5.4 journal reprints, correspondence with publishers	
5.5 submit articles to journals of other key institutions	5.5 at least 10 articles published in relevant journals/newsletters/magazines	5.5 copies of articles in BNHS files	
5.6 present results/lessons of the project at seminars/conferences/workshops	5.6 presentations at 9 gatherings during the project	5.6 Conference proceedings, workshops reports	

***Notes on Assumptions:**

- (1) Continued State and Federal government support for the collection of vulture samples. Permission has already been granted for vulture collection and this is unlikely to be rescinded.
- (2) It is possible to identify the cause of the decline before vultures become extinct. It is anticipated that the cause of the decline will be identified within the first year of the project, and unlikely that these species will become extinct within this period.
- (3) That remedial measures are possible. The type of remedial measures possible will depend upon the origin and nature of any disease, or other factors, identified. However, remedial measures of some type will be possible. These may include taking measures to prevent the spread of disease to other vulture populations, taking measures to limit the ecological and human impacts that reduced vulture populations are likely to have, captive breeding of disease free birds, development of vaccines or identification of immune individuals etc.
- (4) Land available from government for captive holding facility. Land has already been promised for the captive holding facility.

FINANCIAL ASPECTS

20. Please state gross expenditure on the programme of work. Please work by financial year (defined as April to March), using 2000/2001 prices throughout - do not include any allowance for assumed future inflation. Indicate salary costs on Table A and total costs on Table B. For programmes of less than 3 years' duration, enter 'nil' as appropriate for future years. It would be helpful to highlight (by bold, italics or underlining) the areas for which Darwin funding is requested.

Table A Salary costs

		2001/2002	2002/2003	2003/2004
		£	£	£
Team Member	Role in Project			
Andrew Cunningham	Project leader, consultant and trainer in avian diagnostics.			
IoZ Microbiology Trainer	IoZ microbiologist - trainer of BNHS staff			
Dr Deborah Pain	Co-ordination with BNHS over training workshops, vulture surveys and recovery planning process. Participation in recovery planning process.			
Dr Richard Gregory	Trainer in survey methods and ecological data collection.			
Ms Jemima Parry-Jones MBE	Director of NBPC, and responsible for training in captive care of vultures. Participation in recovery planning process.			
NBPC specialist	Trainer in captive care.			
Dr David Houston	Expert in vulture ecology. Participation in recovery planning process.			
Dr Asad Rahmani	Director of main project partner (BNHS) in India.			
Dr Vibhu Prakash	Principal Scientist of BNHS and co-ordinator of vulture project in India. To be trained in UK in captive care of vultures, wildlife diseases and basic diagnostic and histopathology work.			
Mr Gurucharan	BNHS - vulture surveyor			
Ms Nikita	BNHS - vulture surveyor			
Ms Gargi	BNHS - vulture surveyor			
Attendant 1	Responsible for captive maintenance			
Attendant 2	Assistant with captive maintenance			
Dr Ghalsasi	General Manager of PDRC - responsible for avian diagnostic work in India.			
PDRC Virology specialist	Principal diagnostic specialist			
PDRC Technician	Diagnostic assistant			
PDRC Attendant	Diagnostic assistant			
Total				

Team Member	Role in Project	Percentage of time spent on project		
		%		
Andrew Cunningham	Project leader, consultant and trainer in avian diagnostics.	22	17	9
IoZ Microbiology Trainer	IoZ microbiologist - trainer of BNHS staff	0	17	17
Dr Deborah Pain	Co-ordination with BNHS over training workshops, vulture surveys and recovery planning process. Participation in recovery planning process.	9	5	9
Dr Richard Gregory	Trainer in survey methods and ecological data collection.	4	0	2
Ms Jemima Parry-Jones MBE	Director of NBPC, and responsible for training in captive care of vultures. Participation in recovery planning process.	6	0	3
NBPC specialist	Trainer in captive care.	9	9	9
Dr David Houston	Expert in vulture ecology. Participation in recovery planning process.			2
Dr Asad Rahmani	Director of main project partner (BNHS) in India.	10	10	10
Dr Vibhu Prakash	Principal Scientist of BNHS and co-ordinator of vulture project in India. To be trained in UK in captive care of vultures, wildlife diseases and basic diagnostic and histopathology work.	75	75	75
Mr Gurucharan	BNHS - vulture surveyor	17	17	17
Ms Nikita	BNHS - vulture surveyor	17	17	17
Ms Gargi	BNHS - vulture surveyor	17	17	17
Attendant 1	Responsible for captive maintenance	100	100	100
Attendant 2	Assistant with captive maintenance	50	50	50
Dr Ghalsasi	General Manager of PDRC - responsible for avian diagnostic work in India.	10	10	0
PDRC Virology specialist	Principal diagnostic specialist	100	100	0
PDRC Technician	Diagnostic assistant	100	100	0
PDRC Attendant	Diagnostic assistant	100	0	0

Table B Other Costs

	2001/2002	2002/2003	2003/2004
	£	£	£
Rent, rates, heating, lighting, cleaning, overheads			
Institute of Zoology @ 46% of salary total			
RSPB @ 35% of salary total			
National Bird of Prey Centre @ 30% of salary			
University of Glasgow @ 30% of salary			
Bombay Natural History Society			
totals			
Office costs e.g. postage, telephone and stationery			
BNHS			
totals			

Table B Other Costs (continued)**Travel and Subsistence**

BNHS General
Monitoring Workshop
I of Z supervisory visits to India
BNHS Scientists to UK
NBPC staff to India
Recovery Plan
Captive care/disease evaluation workshop - Indian
participation
Captive care/disease evaluation workshop - IoZ/NBPC
staff
totals

Printing

General press/seminar material
Newsletter
Monitoring Manual
Recovery plan
totals

Conferences, Seminars, etc.

Monitoring Training Workshop
Recovery planning workshop
Captive Care/Disease evaluation workshop
totals

Capital items/equipment**BNHS**

1. Laboratory equipment

Microscope
Biochemical analyser
oven
incubators

2. Furniture and other equipment
3. Computer
4. Binoculars
5. Construction cost of aviaries
6. Veterinary products and blood-sampling equipment

PDRC

1. Liquid nitrogen containers
2. Laminar Flow Air cabinets
3. Ultra Low Temperature freezer
totals

Other**PDRC**

Disposable plasticware, imported chemicals, tissue culture and bacteriological media, glassware, reagents for PCR etc.

BNHS

Consumables for Bharatpur laboratory and captive care centre
Vulture capture and maintenance costs
Annual nation-wide survey
Training the Trainer Course

RSPB

Monitoring workshop materials
totals

Sub-total**Cost of Salaries (from previous table)****Total Spend**

21. How is your organisation currently funded?

The Institute of Zoology receives a core grant of approximately per year from the Higher Education Funding Council for England, representing about 60-70% of its total income. The remainder comes from Research Council (NERC, BBSRC, ESRC) grants and contracts from government (DETR, MAFF, English Nature) and non-governmental bodies (World Wildlife Fund, IUCN).

22. Please give details of resources you have sought from the host country partner institution(s) for this project. Include donations in kind e.g.. accommodation with these costed where possible. Indicate any income or donations which are confirmed.

Type of contribution	YEAR TOTALS		
	Year 1 (2001/2002)	Year 2 (2002/2003)	Year 3 (2003/2004)
Salary - Dr Asad Rahmani			
Salary - Dr Ghalsasi			
Rent, rates, heating, lighting, cleaning, overheads Bombay Natural History Society			
PDRC overheads and office costs will also be contributed in kind but have not been costed			
Office costs e.g. postage, telephone and stationery - Bombay Natural History Society			
Total host country contributions			

23 Please state all other sources of income and amounts to be put towards the costs of the project (including any income from other public bodies, private sponsorship, trusts, fees or trading activity).

Type of contribution	YEAR TOTALS		
	Year 1 (2001/2002)	Year 2 (2002/2003)	Year 3 (2003/2004)
Salary - Andrew Cunningham Salary - I of Z Microbiology Trainer Salary - Dr Deborah Pain Salary - Dr Richard Gregory Salary - Jemima Parry-Jones MBE Salary - NBPC specialist Salary - Dr David Houston Rent, rates, heating, lighting, cleaning, overheads Institute of Zoology @ 46% of salary total RSPB @35% of salary total National Bird of Prey Centre @ 30% of salary University of Glasgow @ 30% of salary Capital items/equipment 1. Liquid nitrogen containers 2. Laminar Flow Air cabinets 3. Ultra Low Temperature freezer			
Total other contributions			
Total income from all other sources			

24. Please deduct any confirmed income or donations from elsewhere (where these may be costed) and indicate in Table C the amounts of grant requested under the Darwin Initiative.

Table C Darwin funding request

	2001/2002	2002/2003	2003/2004
Income to be deducted	£29,682	£16,299	£22,265
Amount of Darwin Initiative funding requested	£66,891	£44,148	£37,372

FCO NOTIFICATION

25. Please tick the box if you think that there are sensitivities that the Foreign and Commonwealth Office will need to be aware of should they want to publicise the project's success in the Darwin competition in the host country

CERTIFICATION

On behalf of the trustees/company (delete as appropriate) I apply for a grant of £..... in respect of expenditure to be incurred in the financial year ending 31 March 2002 on the activities specified in paragraph 13.

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct.

I enclose a copy of the organisation's most recent audited accounts and annual report.

Name (block capitals)

Position in the organisation

Signed Date

Please return completed form to the Department of the Environment, Transport and the Regions, 4/A2 Ashdown House, 123 Victoria Street London SW1E 6DE.

Department of the Environment, Transport and the Regions
August 2000