

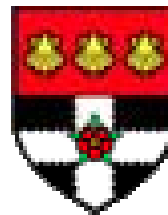


Conservation of the endangered Jerdon's courser in India

Project 162/9/018

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Darwin Initiative for the Survival of Species

Final Report

1. Darwin Project Information

Project Reference No.	162/9/018
Project title	Conservation of the endangered Jerdon's courser in India
Country	India
UK Contractor	University of Reading
Partner Organisation (s)	Bombay Natural History Society, India
Darwin Grant Value	£ 70,261
Start/End date	August 2000 for 3 years
Project website	
Author(s), date	

2. Project Background/Rationale

- Describe the location and circumstances of the project
 Jerdon's courser (*Rhinoptilus bitorquatus*) is one of the 13 most endangered of India's 170 globally threatened or near-threatened bird species. As a result, it is of global conservation importance. This importance is reflected in the fact that this species is listed under Schedule 1 of the Indian Wildlife Protection Act, and is, therefore, given high conservation priority by the Federal and State Governments. Furthermore, two protected areas have been established where the birds have been or were formerly recorded.
 Jerdon's courser is a nocturnal bird known from a handful of records prior to 1900. However, it was considered extinct as no sightings were documented between 1900 and 1986, when it was rediscovered in the Pennar Valley (Eastern Ghats) in Andhra Pradesh, east-central India by the Bombay Natural History Society (BNHS). As a consequence, the area in which the birds were rediscovered was designated as the Sri Lankamalleswara Wildlife Sanctuary.
- What was the problem that the project aimed to address?
 Jerdon's courser is listed by IUCN as endangered. However, there are no data on current population size or geographical distribution, which would allow a more quantitative assessment of the species' current endangerment. Furthermore, very little information is available on the habitats required by these birds, which, combined with a lack of population and range data, makes it very difficult to assess current threats to the population, or assess appropriate habitat management. Therefore, the primary aim of the Darwin project was to fill these information gaps, and make the new knowledge gained during the project as widely available as possible.
- Who identified the need for this project and what evidence is there for a demand for this work and a commitment from the local partner?
 The need for this project was initially identified by Dr. Ken Norris of University of Reading, Dr Debbie Pain of the Royal Society for the Protection of Birds (RSPB) and Dr.

Asad Rahmani of Bombay Natural History Society (BNHS). The subsequent project supported by Darwin reflects this initial partnership. The demand for this work is self-evident given the conservation status of Jerdon's courser both globally and in India, and given the paucity of basic ecological information available. BNHS are the Birdlife partner in India and, as such, have a pivotal role in identifying conservation priorities. Within the Darwin project itself, BNHS staff have run the field research programme, and various staff has been involved in training, dissemination and public awareness initiatives. BNHS have had full responsibility for managing the field research programme, in partnership with the UK participants. Furthermore, BNHS have fully supported participation by the UK partners whilst in India. This provides evidence of their overall commitment to bird conservation generally, and the Darwin project in particular.

3. Project Summary

- What were the purpose and objectives (or outputs) of the project? Please include the project logical framework as an appendix if this formed part of the original project proposal/schedule and report against it. If the log frame has been changed in the meantime, please indicate against which version you are reporting and include it with your report.

No Logical Framework was developed for the project. The overall project purpose was to develop the information-base and capacity among researchers, local Government officials, and local communities to identify and conserve important sites for Jerdon's courser, although no formal project purpose was defined within the original application. To deliver this, the project had four specific objectives:

(1) Undertake research and monitoring work

The overall objective of this aspect of the project was to undertake ecological research on Jerdon's courser to determine current population size and distribution, and identify current threats. This involved two specific objectives: (i) to estimate current population size and geographical range, and (ii) to examine habitat use to determine habitat requirements.

(2) Develop management plan

We originally envisaged developing a management plan based on the research and monitoring work that would include details of required conservation action, and a long-term monitoring programme.

(3) Training

Training to BNHS and Forestry Department staff in the collection, storage and analysis of key ecological information with respect to conserving Jerdon's courser. This objective was designed to ensure the transfer of important skills necessary for long-term monitoring of Jerdon's courser and its habitat.

(4) Public awareness

This was a crucial objective, both at local and governmental levels, to raise the profile of conservation efforts for Jerdon's courser. It included a range of measures targeted at specific groups.

- Were the original objectives or operational plan modified during the project period? If significant changes were made, for what reason, and when were they approved by the Darwin Secretariat?

- None of the original objectives were altered significantly during the project period. The only modification to the project plan was the addition of a no-cost extension at the end of the project that allowed us to continue work for an additional 12 months. This was financed by re-directing funds that were originally targeted for workshops (without compromising any dissemination activities) and with additional financial support to RSPB. This change was done with the approval of the Darwin secretariat. Also, the relevant budgets are detailed below.
- Which of the Articles under the Convention on Biological Diversity (CBD) best describe the project? Summaries of the most relevant Articles to Darwin Projects are presented in Appendix I.

The Darwin project was designed to assist with India's obligations under the Biodiversity Convention by (1) research and monitoring to determine the current status and distribution of the population, and assess threats to its persistence (Article 7); (2) The results of the research work were used to produce a management plan for this species (Article 6); (3) training was provided to the key forest department and research staffs in India concerning the collection, storage and analysis of important ecological data (Article 12); and (4) The management plan as a framework to institute *in-situ* conservation action (Article 8), and raise the profile of Jerdon's courser, and other important species within the area, at various levels (e.g. local, governmental) using public education and awareness campaigns (Article 13).

- Briefly discuss how successful the project was in terms of meeting its objectives. What objectives were not or only partly achieved, and have there been significant additional accomplishments?

The completion of work towards each objective is described below, and the numbering refers directly to the above objectives.

(1) Undertake research and monitoring work

The research and monitoring objectives were completed in full. A reliable method to survey the Jerdon's courser was developed and by applying this method birds were discovered in three new places in and around the existing protected area. Extensive habitat information was collected, and based on this we were able to determine the habitat preferences within the scrub jungle habitat and also mapped the potential habitat in the local area using satellite imagery. We have also used satellite imagery data to assess rates of habitat loss via an MSc study, which is additional to our original plans (a copy of the thesis is appended to this report).

(2) Develop management plan

It is too early to develop a formal management plan for the conservation of Jerdon's courser. This is because we still lack some important ecological information, we lack a detailed understanding of the links between habitat management and the habitat requirements of the birds, and potentially valuable local conservation initiatives (see below) are still being developed. Nevertheless, BNHS have been advising the Andhra Pradesh Forest Department (APFD) in managing the scrub jungle habitat in and around the existing protected area in the form of short and periodical reports, and training sessions in the field. Furthermore, BNHS, together with APFD, have started to develop Community Conservation Areas (CCAs), which offer great potential in bringing conservation for Jerdon's courser into local decision-making.

(3) Training

Training had three main elements: (1) field-based training for BNHS and APFD staff;

(2) a training visit to the UK; and (3) workshops including field-based training. All of these elements were conducted successfully (see below for details).

(4) Public awareness

The project has been extremely successful in public awareness initiatives. The project has been featured in local and national newspapers in India (English and local language articles), and in the UK press (examples are appended to this report). A short video footage was made about the Jerdon's courser project by a private news channel and it was broadcasted throughout Andhra Pradesh. Sound boxes containing the call of Jerdon's courser have been widely distributed locally in India together with details of the bird, its conservation and the project.

4. Scientific, Training, and Technical Assessment

- Please provide a full account of the project's research, training, and/or technical work.
- **Research** - this should include details of staff, methodology, findings and the extent to which research findings have been subject to peer review.

The Director of Bombay Natural History Society, Dr. Asad R. Rahmani, has run the project in India. He appointed Panchapakesan Jeganathan as a Darwin Research Fellow to undertake fieldwork and a number of other BNHS researchers worked on a short-term basis along with field assistants. UK team members supported Jegan in the design and fieldwork and data analysis, but he was responsible for the day-to-day running of the project in the field.

Our original research and monitoring objectives were to develop methods to census Jerdon's courser, understand its habitat requirements, and use these insights to describe its distribution and estimate population size. We have made considerable progress in this area. We have developed two methods for identifying whether or not an area holds Jerdon's courser based on soil tracking strips and playback of the birds' call. This species is very difficult to work with because it is nocturnal, ground-dwelling (living in quite dense scrub forest) and its ecology is very poorly known. Census methods, therefore, cannot rely on direct observation of birds. Our census methods have been innovative in that we have applied methods not previously used on birds (tracking strips), and the Darwin project team were the first people ever to record the call of Jerdon's courser, allowing us to develop playback census methods.

We have also used the soil tracking strips to examine habitat selection. Briefly, we quantified the structure and composition of scrub forest around tracking strips and constructed statistical models that described the tracking rate of Jerdon's courser in relation to habitat. To examine distribution patterns we have used a combination of fieldwork and satellite imagery analysis. Briefly, we first deployed soil tracking strips around the Srilankamalleswara Wildlife Sanctuary and immediate surrounds to search for Jerdon's courser. This work found new locations not previously known to hold birds. These areas were up to 15 km away from the previously known area, and in some instances outside the sanctuary boundary. Secondly, we used satellite imagery analysis to search for potentially suitable Jerdon's courser habitat over a much wider area. These areas were then visited by the field team and censused for Jerdon's courser. At the time of writing, we have censused a number of these areas without finding any new sites holding birds.

We have made less progress on estimating population size largely because we are still waiting for permission to fit radio-transmitters on birds. Last October we held a

radio-tracking demonstration for local Government officials in the field. This was very successful and meant that we were granted permission by the Andhra Pradesh Government to radio-track Jerdon's courser. It also provided a valuable training opportunity (see below). However, we now need permission from the national Government, and, at the time of writing, we were still awaiting this.

Finally, work additional to our original research objectives was conducted during 2004. This involved using satellite imagery analysis to assess rates of habitat loss. This work was conducted by Deepa Senapathi, an Indian student studying at UEA in the UK. This work has been able to quantify current rates of habitat loss, assess the major land-use changes that have driven the losses and relate this to local population centres. We hope to publish some of this work in 2005, and it forms part of a new project on large-scale habitat mapping for which we are currently seeking funding from Darwin.

To date, research and monitoring work has generated three peer-reviewed papers (appended to this report), and a successful MSc thesis.

- **Training and capacity building activities** – this should include information on selection criteria, content, assessment and accreditation.

The main outcome of the training element of the project to date has been to contribute significantly to capacity building within the Bombay Natural History Society (BNHS). The project has been run in India by the Director of BNHS, Dr Asad Rahmani, and a Darwin Research Fellow, Panchapakesan Jeganathan (Jegan). When Jegan began the project he was a relatively inexperienced, masters-level student. He has gained considerable experience during the project in the development and implementation of ecological field methods, including the development of census methods and radio-tracking studies. He has also received specific training in the satellite imagery analysis, and now has considerable expertise in this area. These training elements have been provided by a combination of field training by UK staff, training in India by other institutions (e.g. remote sensing), and training during a prolonged visit to the UK in 2002. Over the course of the project Jegan has progressively increased his own input into project planning, and now takes considerable, independent responsibility for the running of the project. He has registered for a PhD at Mumbai University based on the work he has been conducting within the Darwin project. He is a young biologist with considerable promise, and the Darwin Initiative has provided him with a level of training that he would not have had without its support. He also wrote the initial draft of this final report.

In addition to this direct capacity building, we have conducted a further two major training and dissemination initiatives. The first was a workshop held in Hyderabad in January 2003. This workshop was designed to disseminate to a wide audience the results of the project so far, describe and discuss the methods being used in the field, and to discuss the future direction of the project. This workshop was very well received, and attracted considerable publicity. The main products from this meeting were (1) general proposals to consider training local forestry department staff in field methods used to census Jerdon's courser, and (2) a proposal to develop radio-tracking studies on Jerdon's courser. The second initiative concerned a field workshop on radio-tracking in August 2003, which developed from proposals we put to the Andhra Pradesh Government to allow us to radio-track birds. This is an essential step for a range of reasons, but is necessitated by the fact that it is simply impossible to

track birds directly. The field workshop involved Government officials from Hyderabad, and local Forestry Department staff. It began with presentations about the need for the work and what it would tell us, before moving into the field. In the field, other ground-dwelling species, similar in size and ecology to Jerdon's courser, were trapped, fitted with radio-tags and released. The birds were then tracked for a short time by people involved in the workshop and for a longer time period by the Darwin field team in order to develop skills in radio-tracking techniques. The workshop was organised and run by BNHS and supported by UK staff involved in the project who provided technical input (e.g. fitting radio-tags, training in tracking). As a consequence of this workshop, we were granted permission to radio-track Jerdon's courser by the Andhra Pradesh Government, and the entire participatory process was highly regarded by the Government officials.

Finally, the project has also provided training opportunities to an Indian-born MSc student based at UEA in the UK. This work led to an MSc thesis, and specific training in the application of satellite imagery analysis to land-use mapping and quantifying land-use change. This work was additional to our original training objectives, but it provided crucially important groundwork for future larger-scale mapping studies as well as valuable capacity building.

5. Project Impacts

- What evidence is there that project achievements have led to the accomplishment of the project purpose? Has achievement of objectives/outputs resulted in other, unexpected impacts?

The project purpose aimed to build the information-base and capacity necessary to promote effective conservation for Jerdon's courser. Research and monitoring outputs show that we have significantly built on the information-base. We have developed censusing methods, researched habitat requirements, and used satellite imagery analysis to classify habitats and land-use. This work has produced papers in peer-reviewed journals, reports and popular science articles. The results of this work have also been broadly disseminated. Capacity-building has involved researchers, local Government officials and the local community. Evidence relating to this concerns outputs from researchers that include publications, reports and higher degrees (one PhD in preparation and a completed MSc); outputs relating to local Government officials including workshops and field-based training; outputs relating to the local community that include the production and distribution of sound boxes, the use of Jerdon's courser as the 2004 symbol in local cultural celebrations; and initial discussions concerning the establishment of community conservation areas (CCAs); and outputs relating to public dissemination in the local and national press.

- To what extent has the project achieved its purpose, i.e. how has it helped the host country to meet its obligations under the Biodiversity Convention (CBD), or what indication is there that it is likely to do so in the future? Information should be provided on plans, actions or policies by the host institution and government resulting directly from the project that building on new skills and research findings.

The project has helped us work with the Andhra Pradesh Forest Department (APFD) to ensure, at least in the short-term, that management of the scrub jungle habitat takes account of the habitat requirements of Jerdon's courser. For example, during the project APFD officials undertook several activities within the existing protected area that could have been detrimental to Jerdon's courser conservation. Our work

during the project was used to point out that these activities may reduce the suitability of habitat for the birds, and as a result the activities were stopped inside the protected area. In addition, during the Darwin project Jerdon's courser was discovered outside existing protected areas. We have proposed converting these areas into Community Conservation Areas (CCAs). These plans are still at an initial stage but the Darwin team has forwarded a report to APFD as part of this process. The establishment of CCAs is a potentially powerful way of delivering conservation locally that takes account of the needs of local communities.

- Please complete the table in Appendix I to show the contribution made by different components of the project to the measures for biodiversity conservation defined in the CBD Articles.

Done

- If there were training or capacity building elements to the project, to what extent has this improved local capacity to further biodiversity work in the host country and what is the evidence for this? Where possible, please provide information on what each student / trainee is now doing (or what they expect to be doing in the longer term).

Capacity-building within the project has revolved around improving skills for the researchers from the BNHS, and more broadly to APFD. BNHS staff have gained considerable experience primarily in field-based research and monitoring methods and also trained local people working within the field project. The BNHS Darwin Research Fellow has registered for a PhD at Mumbai University based on the work he has been conducting within this project. He has also played an important role in a range of project outputs (papers, reports, workshops, wider dissemination). This experience (as evidenced by the project outputs) has significantly improved his capacity to undertake relevant biodiversity-related research in India. His longer-term ambition is to remain working in Indian conservation, and if funding can be secured this will involve further work on Jerdon's courser. The Darwin project has also contributed to an MSc in Applied Ecology by an Indian student based in the UK, whose long-term aim is to work in Indian conservation.

Apart from this, the Darwin team has held workshops and field-based demonstrations to APFD about research and monitoring methods and project results, which will be valuable in habitat management decisions and any longer-term conservation research or action involving APFD.

- Discuss the impact of the project in terms of collaboration to date between UK and local partner. What impact has the project made on local collaboration such as improved links between Governmental and civil society groups?

The project has proved an excellent vehicle for further developing links between the main Indian (BNHS) and UK partners. This has led to the effective transfer of a broad range of ecological experience and skills from the UK to India, as evidenced by the array of project outputs that are collaborative (publications, workshops, training, etc). The project has also broadened collaborative links that now involve other Indian personnel (e.g. MSc student) and research groups in the UK and India (e.g. remote sensing work).

The project has also stimulated much closer working relations between BNHS and

APFD. During the initial stages of the project these relationships were difficult, but continued work by the project team have significantly improved these relationships. Now APFD play a full part in the project by supporting the work and working directly with BNHS in local conservation and management initiatives.

In terms of social impact, who has benefited from the project? Has the project had (or is likely to result in) an unexpected positive or negative impact on individuals or local communities? What are the indicators for this and how were they measured?

This is difficult to quantify. In the longer-term, it is possible our work will lead to more sustainable land-use policies among local communities. For example, CCAs provide a potential mechanism for integrating conservation with the wider needs of local people. To be effective, this mechanism requires more integrated and sustainable management decisions. Hopefully, this will provide both conservation benefits and lead to more sustainable land-use and resource exploitation strategies, although globally reconciling these sorts of interests is still controversial. Our work has clearly benefited the conservation community in India, in that the project has improved the information-base relating to Jerdon's courser, and significantly raised the birds' profile.

In the longer-term we are hopeful that our work will have positive impacts on the local community via improved and more sustainable land-use practices. We see integrated conservation as the only way to make conservation relevant to local communities without imposing solutions that are likely to have negative impacts. However, it is too early to be certain about the outcome.

6. Project Outputs

- Quantify all project outputs in the table in Appendix II using the coding and format of the Darwin Initiative Standard Output Measures.
Done
- Explain differences in actual outputs against those in the agreed schedule, i.e. what outputs were not achieved or only partly achieved? Were additional outputs achieved? Give details in the table in Appendix II.
Done
- Provide full details in Appendix III of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website database.
So far three papers have been published in scientific journals and two popular science articles in Indian magazines. Details are given in Appendix III.
- How has information relating to project outputs and outcomes been disseminated, and who was/is the target audience? Will this continue or develop after project completion and, if so, who will be responsible and bear the cost of further information dissemination?

Apart from the publications, we have disseminated project outputs and outcomes using written reports, workshops, seminars, and via the press. We have also developed and distributed a sound box, plus information leaflet, widely within the local population to raise awareness. The audience for this work has been diverse and includes researchers (in India and the UK), Governmental institutions mainly APFD, NGOs (WWF-India, Wildlife Conservation Society of India, Bird Watching Society of Andhra Pradesh), local communities in India, and the general public both in India and

in the UK. After project completion, this work will continue to be undertaken by BNHS as part of its wider role as Birdlife partner in India.

7. Project Expenditure

Expenditure items	2000/2001	2001/2002	2002/2003	2003/2004
TOTAL	30,963	11,852	14,352	13,094

1. The original project was due to end on 31st July 2003. In May 2003 we requested permission (which was subsequently granted) to use £11,000 in the 2003/04 budget to fund a no-cost extension to the project. These funds were used as planned to maintain the field team in India for a further year and support UK staff involvement in training and fieldwork.

8. Project Operation and Partnerships

- How many local partners worked on project activities and how does this differ from initial plans for partnerships? Who were the main partners and the most active partners, and what is their role in biodiversity issues? How were partners involved in project planning and implementation? Were plans modified significantly in response to local consultation?

The main local partner involved in project activities was BNHS, and this follows our initial plans. BNHS played a full and active role as the lead local partner. They were directly responsible for the day-to-day running of the field project, and played the lead role in all dissemination activities in India. Overall project planning was undertaken collaboratively by the UK partners and BNHS. BNHS have a direct role in biodiversity conservation in India via their work within the Birdlife partnership.

APFD have also played an active role in the project, primarily in support of BNHS' work, as a target for dissemination activities lead by BNHS and supported by the UK partners, and in wider initiatives involving the local population. APFD have direct management responsibility for protected areas including those holding Jerdon's courser. Latterly, APFD have played an active role in CCA discussions and in using Jerdon's courser as a local heritage symbol.

- During the project lifetime, what collaboration existed with similar projects (Darwin or other) elsewhere in the host country? Was there consultation with the host country Biodiversity Strategy (BS) Office?

BNHS plays an active role in India in developing Biodiversity Strategy through its role as Birdlife partner. The Darwin project and its results were, therefore, intimately linked to wider biodiversity conservation within India. The project itself did not link directly

with other Darwin projects in India, although the project shared staff and institutions (both Indian and UK) with the Darwin funded project on vulture declines in India. We also discussed our project with researchers in Chennai who had previously undertaken studies on scrub forest habitats inhabited by Jerdon's courser using satellite imagery.

- How many international partners participated in project activities? Provide names of main international partners.
University of Reading, Royal Society for the Protection of Birds and University of Cambridge.
- To your knowledge, have the local partnerships been active after the end of the Darwin Project and what is the level of their participation with the local biodiversity strategy process and other local Government activities? Is more community participation needed and is there a role for the private sector?

Yes. BNHS and APFD are currently working together on CCAs in order to protect Jerdon's courser sites discovered by the Darwin project outside existing protected area boundaries. This work will hopefully not only secure sites for Jerdon's courser but also bring its conservation together with the land-use needs of local people.

9. Monitoring and Evaluation, Lesson learning

- Please explain your strategy for monitoring and evaluation (M&E) and give an outline of results. How does this **demonstrate** the value of the project? E.g. what baseline information was collected (e.g. scientific, social, economic), milestones in the project design, and indicators to identify your achievements (at purpose and goal level).

Our monitoring and evaluation strategy was based on assessment criteria that related to the specific objectives of our project. These were outlined in our original proposal (Section 3). The criteria were: (1) successful completion of planned fieldwork; (2) completion of the management plan; (3) trained local staff with a working knowledge and ability to collect, store and analyse required ecological information; and (4) an agreed strategy and timetable for the management plans implementation. The project has clearly delivered on criteria (1) and (3) in terms of relevant outputs and original objectives (described elsewhere in this report). This demonstrates value in the sense that both relate to building the information-base and capacity to help conserve Jerdon's courser which is the project purpose. The project has not produced a formal management plan or timetable for its implementation (criteria (2) and (4)). As stated above, this reflects the fact that we need additional ecological information, and plans have been overtaken to some extent by unexpected events. Within the existing protected area the project is already contributing directly to management decision-making in a reactive way. For example, identifying potentially damaging activities. Furthermore, the identification of new sites for Jerdon's courser outside the existing protected area has stimulated the development of alternative conservation measures (CCAs) that were not envisaged by our original proposal. This latter development could be particularly important if other sites are identified outside existing protected areas. In this sense, we still feel that we can demonstrate value against our original objectives in that the project has been instrumental in generating potentially valuable management without formally developing a management plan. In the future, we hope to be able to undertake larger-scale habitat mapping work together with protected area designation and CCAs that could then form the basis for a more formal management-planning framework.

- What were the main problems and what steps were taken to overcome them?

The project has encountered few serious problems. The most difficult, particularly during the project's early stages, were working relations with APFD. However, these have significantly improved due to hard work by the project team. The improvement can be attributed to better working relations between individuals and a more efficient flow of information about the project. Now BNHS and APFD work closely together on local conservation initiatives.

The only other difficulty has been obtaining permission for radio-tracking birds. Part of our original research plans included radio-tracking studies. However, we still await permission for this, at least from the national Government. The project team has worked hard to address this issue. In India protected status means that birds cannot be trapped without permission. This means officials are extremely conservative about granting permission for fear of damaging important populations. Eventually following a series of workshops, one of which involved a field-based demonstration of radio-tracking, we obtained permission from the Andhra Pradesh Government. We are still waiting for permission from the national Government, which has been further delayed by recent elections. At the present time, extensive lobbying is being undertaken both by Indian officials and UK partners. In terms of our project objectives, this delay has had a relatively minor impact on our original objectives since we achieved considerable progress in our other ecological work. This can now form the basis of large-scale habitat mapping work in the future, and if permission for radio-tracking is given we have plans ready for detailed field studies.

- During the project period, has there been an internal or external evaluation of the work or are there any plans for this?
None, other than that involved in peer-reviewed publications.
- What are the key lessons to be drawn from the experience of this project? We would welcome your comments on any broader lessons for Darwin Initiative as a programme or practical lessons that could be valuable to other projects, as we would like to present this information on a website page.

It is right that the objectives of Darwin projects should be ambitious in terms of what they want to achieve for biodiversity conservation. In our case, we started work on a bird species that was only known from a very small area of scrub jungle and for which there was virtually no basic ecological information available. The ambitious aspect of our project was to collect sufficient new ecological data on distribution and habitat requirements in order to provide information for wider conservation efforts. We have achieved this in terms of providing input into protected area management and stimulating local community-based conservation initiatives. However, this ambition also has to be tempered with realism. Many countries, like India, rich in biodiversity have very different views on what conservation involves. In the developed world we are used to conservation involving the active intervention and manipulation of populations and habitats in the wild. In countries like India, conservation involves designating protected areas and controlling the activities of local people. Clearly this can potentially cause conflict. Furthermore, damage to sensitive ecosystems often involves ignorance. There is a real challenge here for Darwin projects to develop novel ways of bringing conservation closer to the needs of local people in a way that

attempts to resolve conflicts. Our project in India illustrates the first stages of this process using a range of dissemination and community-based initiatives.

10. Actions taken in response to annual report reviews (if applicable)

- Have you responded to issues raised in the reviews of your annual reports? Have you discussed the reviews with your collaborators? Briefly summarise what actions have been taken over the lifetime of the project as a result of recommendations from previous reviews.

Yes and yes. The reports raised a number of general issues: (1) working relations, (2) local community involvement, and (3) details of capital expenditure. These are really issues of clarification because each is addressed by our work and reported in more detail here. As stated above, working relations with APFD are now very good and constructive. Local community involvement has taken place in a number of ways: local individuals have worked on the project as field assistants, sound boxes were designed to raise awareness of the project among the local community and CCAs. Radio-tracking work has not taken place (see above) so capital expenditure has supported other aspects of the ecological work e.g. infra-red cameras, sound recording equipment, although we recently purchased radio-tracking equipment (receiver and antennae) in order to have the basic support for any future studies should permission be granted.

11. Darwin Identity

- What effort has the project made to publicise the Darwin Initiative, e.g. where did the project use the Darwin Initiative logo, promote Darwin funding opportunities or projects? Was there evidence that Darwin Fellows or Darwin Scholars/Students used these titles?

All our written material bears the Darwin Initiative name/logo. Details of the project have been included on the BNHS and RSPB websites. All presentations made by team members publicise that this project is funded by Darwin initiative.

- What is the understanding of Darwin Identity in the host country? Who, within the host country, is likely to be familiar with the Darwin Initiative and what evidence is there to show that people are aware of this project and the aims of the Darwin Initiative?

The Darwin Initiative is well known in India among those actively involved in conservation. For example, within BNHS all staff are aware of the Jerdon's courser project, its support from Darwin and its broad aims. APFD staff involved in the project and its associated support are also aware of Darwin. Profile is obviously much less among local communities around the study area, although local people near by the study area are well aware of our project work. Local people involved in the project itself were aware of Darwin.

- Considering the project in the context of biodiversity conservation in the host country, did it form part of a larger programme or was it recognised as a distinct project with a clear identity?

This project is not a part of larger programme and it has got a clear identity.

12. Leverage

- During the lifetime of the project, what additional funds were attracted to biodiversity work associated with the project, including additional investment by partners?

We secured additional funding from RSPB of £15,000.

- What efforts were made by UK project staff to strengthen the capacity of partners to secure further funds for similar work in the host country and were attempts made to capture funds from international donors?

Nothing was done explicitly within the project, although UK partners and BNHS staff involved in the Jerdon's courser project also put together a successful bid to Darwin to support work on Indian vultures. The Jerdon's courser project played an important role in putting together a working partnership that could then address similar issues. No attempts were made during the project to secure other funding from international donors.

13. Sustainability and Legacy

- What project achievements are most likely to endure? What will happen to project staff and resources after the project ends? Are partners likely to keep in touch?

The project partnership will endure and is already working together on other related projects. Within the context of the Jerdon's courser work itself, the information-base and capacity will endure in the short-term at least, and at present partnerships developed by the project are taking important practical steps forward (e.g. CCAs). In the medium to longer-term, maintaining the same momentum for the Jerdon's courser project, including the partners and individuals involved, will depend on securing funding. Without this the life span of the project's achievements to date will be reduced.

- Have the project's conclusions and outputs been widely applied? How could legacy have been improved?

Yes. The project is contributing directly to the management of existing protected areas, the identification of new ones and community-based conservation initiatives. It is difficult to see how legacy could have been improved within the life of the project. Clearly, in the longer-term this depends on future funding.

- Are additional funds being sought to continue aspects of the project (funds from where and for which aspects)?

Yes. We have developed a new Darwin project that aims to use large-scale habitat mapping using satellite imagery data to support the designation of new protected areas and community-based conservation initiatives. This includes further financial support from UK project partners.

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

This section should be completed ONLY if you wish to be considered for invitation to apply for Post Project Funding. Each year, a small number of Darwin projects will be invited to apply for funding. Selection of these projects will be based on promising project work, reviews, and your comments within this section. Further information on this funding scheme is available from the Darwin website.

- *What follow-up activities would help to embed or consolidate the results of your Darwin project, and why would you consider these as suitable for Darwin Post Project Funding?*
- *What evidence is there of strong commitment and capacity by host country partners to enable them to play a major role in follow-up activities?*

15. Value for money

- Considering the costs and benefits of the project, how do you rate the project in terms of value for money and what evidence do you have to support these

conclusions?

Without undertaking this project work Jerdon's courser would have remained an enigmatic, poorly known species doomed to extinction. This ultimate end has not been avoided yet, but the project has made important steps towards collecting the basic information, building the basic capacity and raising local awareness and the local participation needed to do it. The financial cost to Darwin has been modest (in comparison with other funded projects), mainly because Indian researchers have conducted the day-to-day work. Quantifying the benefits is more difficult, but if these are measured in terms of progress then the project has achieved much from a starting point of very little. In my view, this all means the project represents very good value for money.

Appendix I: Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Please complete the table below to show the extent of project contribution to the different measures for biodiversity conservation defined in the CBD Articles. This will enable us to tie Darwin projects more directly into CBD areas and to see if the underlying objective of the Darwin Initiative has been met. We have focused on CBD Articles that are most relevant to biodiversity conservation initiatives by small projects in developing countries. However, certain Articles have been omitted where they apply across the board. Where there is overlap between measures described by two different Articles, allocate the % to the most appropriate one.

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	5	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	40	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	20	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	5	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.

12. Research and Training	15	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	15	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	100%	Check % = total 100

16. Appendix II Outputs

Please quantify and briefly describe all project outputs using the coding and format of the Darwin Initiative Standard Output Measures.

Code	Total to date (reduce box)	Detail (←expand box)
Training Outputs		
1a	Number of people to submit PhD thesis	1. The Darwin Research Fellow will submit a PhD Thesis based on the work funded by Darwin early in 2005
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	1. The project supported a Masters project by a UEA-based Indian student in 2004.
3	Number of other qualifications obtained	
4a	Number of undergraduate students receiving training	
4b	Number of training weeks provided to undergraduate students	
4c	Number of postgraduate students receiving training (not 1-3 above)	3 former BNHS Researchers were trained
4d	Number of training weeks for postgraduate students	6 months
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(i.e not categories 1-4 above)	3 BNHS field assistants have been trained
6a	Number of people receiving other forms of short-term education/training (i.e not categories 1-5 above)	
6b	Number of training weeks not leading to formal qualification	
7	Number of types of training materials produced for use by host country(s)	
Research Outputs		
8	Number of weeks spent by UK project staff on project work in host country(s)	30. This has been accomplished by periodic visits to India by various UK project partners in support of fieldwork training and data collection, and other training and dissemination activities.

Code	Total to date (reduce box)	Detail (←expand box)
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	None. Our original proposal aimed to produce a management plan by this stage. This hasn't been done because we haven't reached a sufficient information base to support formal management planning yet. The project is still attempting to map suitable habitat and find new areas supporting the birds, and ensure some protection for scrub habitats located in this way.
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1. We haven't produced a manual on ecological field methods at this stage because our monitoring methods are already publicly available through published papers. We have widely circulated sound boxes containing a recorded call of Jerdon's courser to the local community, together with an information leaflet giving details of the birds, the project and its conservation.
11a	Number of papers published or accepted for publication in peer reviewed journals	<p>3 papers</p> <p>Oryx Vol 36 No 2 April 2002. This paper describes our basic monitoring protocol.</p> <p>Journal of the Bombay Natural History Society, 101 (1), Jan.-Apr. 2004. This paper records details of the birds' call, recorded for the first time during the Darwin project.</p> <p>Journal of Applied Ecology 2004 41, 224 –237. This paper presents data on habitat selection and some preliminary analyses of satellite imagery data.</p>

Code	Total to date (reduce box)	Detail (←expand box)
11b	Number of papers published or accepted for publication elsewhere	
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	We are currently compiling a database based on fieldwork conducted to date.
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced and handed over to host country(s)	

Dissemination Outputs		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	Three in India involved in dissemination and training activities. One in Hyderabad on January 2003 Second was on August 2003 in Cuddapah Third was on August 2004 in Cuddapah
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	JBNHS, Centenary Journal Seminar, Mumbai; plus 6 seminars in the UK
15a	Number of national press releases or publicity articles in host country(s)	Three newspaper articles on our project
15b	Number of local press releases or publicity articles in host country(s)	Three newspaper articles in Telugu language
15c	Number of national press releases or publicity articles in UK	Four. These generated significant interest in the UK press, and led to the project being publicized via University dissemination material.
15d	Number of local press releases or publicity articles in UK	
16a	Number of issues of newsletters produced in the host country(s)	An information leaflet was produced to accompany the sound boxes (see output 10).
16b	Estimated circulation of each newsletter in the host country(s)	2000.
16c	Estimated circulation of each newsletter in the UK	
17a	Number of dissemination networks established	We have established an informal network involving the UK partners, BNHS and the Andhra Pradesh Forestry Department
17b	Number of dissemination networks enhanced or extended	
18a	Number of national TV programmes/features in host country(s)	None. Dissemination to the wider public has been mainly via newspapers and the information leaflet.
18b	Number of national TV programme/features in the UK	
18c	Number of local TV programme/features in host country	One on the sound box release
18d	Number of local TV programme features in the UK	

19a	Number of national radio interviews/features in host country(s)	None. Dissemination to the wider public has been mainly via newspapers and the information leaflet.
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	
19d	Number of local radio interviews/features in the UK	
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	
21	Number of permanent educational/training/research facilities or organisation established	
22	Number of permanent field plots established	
23	Value of additional resources raised for project	£15,000 from RSPB

17. Appendix III: Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website Publications Database that is currently being compiled.

Mark (*) all publications and other material that you have included with this report

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publisher s (name, city)	Available from (e.g. contact address, website)	Cost £
Journal	Jeganathan. P, Rhys E. Green, C.G.R. Bowden, K.Norris, Debbie Pain and Asad R. Rahmani Use of tracking strips and automatic cameras for detecting Critically Endangered Jerdon's coursers <i>Rhinoptilus bitorquatus</i> in scrub jungle in Andhra Pradesh, India Oryx Vol 36 No 2 April 2002	Cambridge University Press	Ken Norris (see below)	Free
	Jeganathan. P & Simon R. Wotton The first recordings of calls of the Jerdon's courser <i>Rhinoptilus bitorquatus</i> (blyth), Family Glareolidae Journal of the Bombay Natural History Society, 101 (1), Jan.-Apr. 2004	Bombay Natural History Society, Mumbai	Asad Rahmani (see below)	Free

	<p>Modelling habitat selection and distribution of the critically endangered Jerdon's courser <i>Rhinoptilus bitorquatus</i> in scrub jungle: an application of a new tracking method</p> <p>Panchapakesan Jeganathan, Rhys E. Green, Ken Norris, Ioannis N. Vogiatzakis, Annett Bartsch, Simon R. Wotton, Christopher G. R. Bowden, Geoffrey H. Griffiths, Debbie Pain & Asad R. Rahmani</p> <p>Journal of Applied Ecology 2004 41, 224 –237</p>	Blackwell Publishing, Ltd.	Ken Norris (see below)	Free

18. Appendix IV: Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide contact details below.

Project Title	Conservation of the endangered Jerdon's courser in India
Ref. No.	162/9/018
UK Leader Details	
Name	Professor Ken Norris
Role within Darwin Project	Overall project leader
Address	Centre for Agri-Environment Research (CAER) School of Agriculture, Policy & Development University of Reading Earley Gate PO Box 237 Reading RG6 6AR
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	
Role within Darwin Project	
Address	
Phone	
Fax	
Email	
Partner 1	
Name	Asad R. Rahmani
Organisation	Bombay Natural History Society
Role within Darwin Project	Host country project co coordinator
Address	Hornbill House, Dr. Salim Ali Chowk, SBS Road, Mumbai -23
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	