



Darwin Initiative Second Annual Report  
Project reference 14-008

*The Darwin Initiative Centre for Bat Conservation in China*

Project leader: Professor Gareth Jones, School of Biological Sciences,  
University of Bristol,

Project partner: Professor Shuyi Zhang, Institute of Zoology, Chinese  
Academy of Sciences, China.

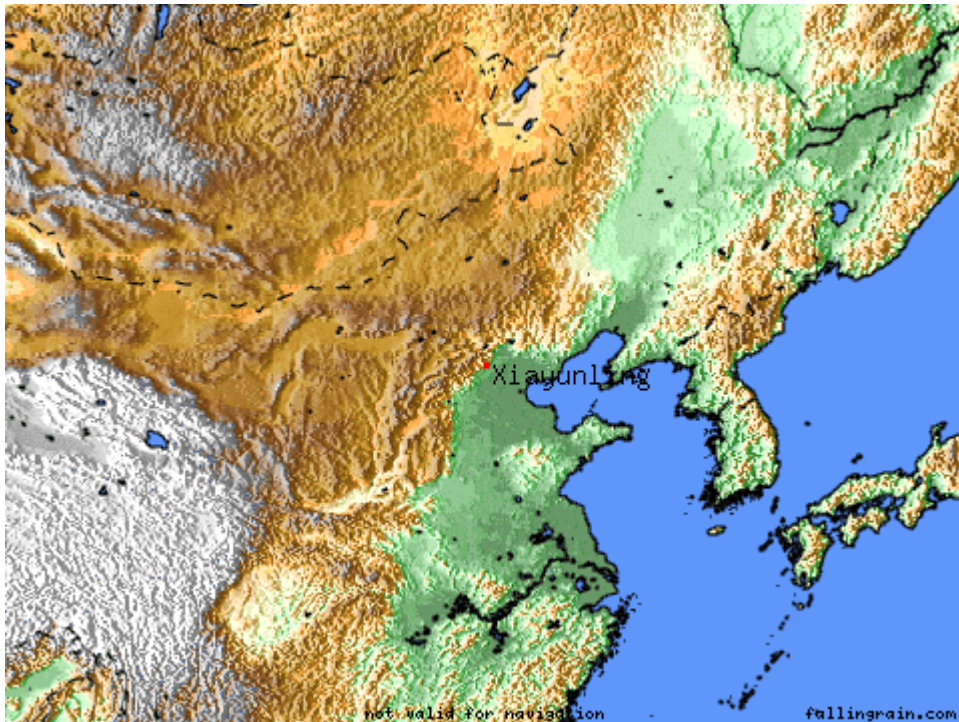
# Darwin Initiative Annual Report

## **Darwin Project Information**

<i>Project Ref Number</i>	14-008
<i>Project Title</i>	<i>The Darwin Initiative Centre for Bat Conservation in China</i>
<i>Country(ies)</i>	<i>China</i>
<i>UK Contract Holder Institution</i>	<i>University of Bristol</i>
<i>UK Partner Institution(s)</i>	
<i>Host country Partner Institution(s)</i>	<i>Institute of Zoology, Chinese Academy of Sciences</i>
<i>Darwin Grant Value</i>	<i>£112,000 (plus £30,000 from Chinese collaborator)</i>
<i>Start/End dates of Project</i>	<i>1 July 2005 – 30 June 2008</i>
<i>Reporting period</i>	<i>1 July 2006 - 31 March 2007</i> <i>Second annual report (now 21 months into 36 month project)</i>
<i>Project Leader Name</i>	<i>Professor Gareth Jones</i>
<i>Project website</i>	<i><a href="http://www.bio.bris.ac.uk/research/bats/China%20bats/index.htm">http://www.bio.bris.ac.uk/research/bats/China%20bats/index.htm</a></i>
<i>Author(s), date</i>	<i>Jinshuo Zhang, Shuyi Zhang, Gareth Jones, 2006-7</i>

### **1. Project Background**

The Darwin Initiative Centre for Bat Research and Conservation is situated in Xiayunling (latitude 38° 43'29 N; longitude 115° 44'7 E), about 100km SW of Beijing, China (map below, reproduced from <http://www.fallingrain.com/world/CH/22/Xiayunling.html>).



The diversity of bats in China is poorly understood. With 120 species listed to date, China has one of the most speciose bat faunas worldwide. However the validity and taxonomy of many of the described species is open to question, and a more in depth study of their taxonomy is needed. Despite their rich faunal diversity, bats in China are threatened due to extreme human pressure – through habitat loss, cave disturbance and human consumption. There is a clear need for education programmes to disseminate information about the ecological importance of bats, and to increase their protection. A Red Data book of the Endemic Mammals of China listed 6 microchiropteran bats as Rare, Vulnerable or Indeterminate (Wang, 1988 – China Red data Book of Endangered Animals: Mammalia Science Press, Beijing), and in reality accurate information on population levels of any species is lacking. Our project will assist in the conservation of these Red Data species, and will provide baseline data for future surveys to detect trends in population size.

The project will be based around Beijing, and is in collaboration with the Institute of Zoology, Chinese Academy of Sciences. The main aims are to build capacity for bat research in China (including training of 2 PhD students); to improve understanding of the taxonomy of Chinese bats; to develop a website about the biology of Chinese bats; to provide education programmes from an education centre about the importance of bat conservation.

## **2. Project Partnerships**

**Project partnerships:** The partnership between the University of Bristol and the Chinese Academy of Sciences has strengthened considerably in the last year. Professor Jones spent a week in China planning the project and visiting the research station and the site of the education centre. The two Chinese PhD students – Li Gang and Jinshuo Zhang – spent over a month at the University of Bristol. The students visited the UK National Bat Conference to understand some of the conservation programmes in the UK. In total we now have 4 jointly authored papers published or

accepted for publication in scientific journals, with another one submitted. We have worked in partnership in developing a website on the biology of Chinese bats.

**Other Collaborations:** We have limited collaboration with Kadoorie Farm Conservation Centre, Hong Kong, who have developed a booklet about the conservation of bats in Hong Kong. This may serve as a useful model for a publication aimed at the rest of China, and an agreement has been reached to include the booklet (with Chinese text) on our website. We have established research collaborations with scientists from Switzerland, the USA, New Zealand and many Chinese universities in writing up our scientific papers.

### **3. *Project progress***

#### **3.1 *Progress in carrying out project activities***

Extensive progress has been made in all major areas of the project. We have developed the Darwin Initiative Centre for Bat Research and Conservation in Xiayunling, which has served as the base for a number of research projects by Chinese researchers. We have completed negotiations in buying one floor of a primary school in Xiayunling, and have begun a series of lectures on bat conservation there for schoolchildren. We have completed a large portion of our website on Chinese bats (<http://www.bio.bris.ac.uk/research/bats/China%20bats/index.htm>) with descriptions of 30 species, including photographs, range maps, echolocation call recordings and a bibliography. We have had 2 papers published in refereed journals in the last year, one accepted for publication, and another under review. We have described a new bat species for China, and we have published articles about the Darwin Initiative work in Chinese popular science magazines.

#### **3.2 *Progress towards Project Outputs***

Outputs listed in the initial logical framework are listed below, with a summary of progress made:

Foundation and running of Darwin Initiative Centre for Bat Conservation. We have contributed to the Darwin Initiative Centre for Bat Research at Xiayunling, where extensive poster boards and a small museum display have been established (see <http://www.bio.bris.ac.uk/research/bats/China%20bats/Research%20Centre.htm> for photos of these). We have now purchased a floor at a nearby primary school for use as an education centre. We have developed a PowerPoint presentation in Chinese about the importance of bat conservation ('Bats and us'). The first presentation at the centre to 150 schoolchildren took place on 18 April (photos below).



Site of education centre, Xiayunling School



First school presentation 'Bats and us' April 2007



Jinshuo Zhang with the school head, Darwin Initiative Education Centre, April 2007

We have contributed to the nearby Darwin Initiative Centre for Bat Research at Xiayunling, where extensive poster boards and a small museum display have been established (see <http://www.bio.bris.ac.uk/research/bats/China%20bats/Research%20Centre.htm> for photos of these). The Research centre has been used by a number of researchers studying bat biology, including a study of fishing behaviour by *Myotis ricketti* (Dr Ma Jie) and studies on the magnetic orientation of bats (Yin-an Wang). The BBC filmed the fishing bats there in July 2006 for a forthcoming series on 'Wild China'.

Selected images are included below:



Emblems at the research centre



View into the flight room from the foyer



Professor Zhang above the research centre

The delay in setting up the education centre was covered in the previous annual report. We are pleased that the centre is now open and in use.

2. Identification key for Chinese bats. We have focussed on an online version of this that can be readily updated as our knowledge grows. Professor Jones developed the site in September 2006 when PhD student Jinshuo Zhang was visiting. Profiles of 30 species are now available online (covering all families represented in China), including photographs, details of diagnostic identification features, recordings of echolocation calls and distribution maps. We believe this is one of the most thorough online guides to bats available at present, and we will continue to develop the site with profiles of more species. The site can be accessed at

<http://www.bio.bris.ac.uk/research/bats/China%20bats/index.htm>

with species accounts accessed by clicking on the family names in the left hand column of the page.

3. Baseline data on population sizes of Chinese bats. We continue to collect data on numbers of bats at roost sites visited, but the emphasis of research has focussed more on accurately documenting the species of bat present in China, rather than on recording numbers.

4. Education packages for teachers and children. We have developed the PowerPoint presentation 'Bats and us' for schoolchildren. We hope that teachers will also use the website.

5. Lessons learned and best practises disseminated. We have completed two articles on the Darwin Initiative work in Chinese popular science journals – one will be published in China Nature, Issue 4 (July, 2007). The other was in the newspaper, Science Times (an official newspaper of CAS), on 22 April, 2005 (not previously reported in last year's review – photo below).



# 英国达尔文基金资助 华南蝙蝠研究与保护

本报讯 中国科学院广州生物医药与健康研究院、中国科学院动物研究所与英国布里斯托尔大学的科学家,在英国达尔文基金(Darwin Initiative)的资助下,将在广州附近建立华南蝙蝠研究与保护基地。这将是我国第二个专门以研究和保护蝙蝠为主的机构。

达尔文基金是由英国政府环境、食物和农村事务部提供和管理的一项基金,旨在推动世界范围内生物多样性研究和保护,以及自然资源的可持续利用。该基金是在1992年联合国环发大会的历史背景下建立的,目前已经资助了270多个项目,涉及100多个国家。

蝙蝠是世界上分布最广、进化最为成功的哺乳动物类群之一,也是惟一能够真正飞行的兽类。它们隶属于翼手目,达1107种,占世界哺乳动物的1/5,分为大蝙蝠亚目和小蝙蝠亚目,其体型大小和生活习性存在很大差别。

蝙蝠与人类的关系极为密切。食虫的小蝙蝠是许多农林业害虫的天敌,是温带森林和农田生态系统中的关键动物类群;在热带森林生态系统中,食水果的果蝠作为播种者和传粉者,对很多植物的维持、扩散和再生也起着决定性作用;同时,很多蝙蝠又是重要的人畜共患

病原的自然宿主。所以,研究和保护蝙蝠,并与之和谐共处,是全世界的动物生态学者越来越关注的一个大问题。

令人担忧的是,尽管蝙蝠有广泛的适应性,但在生境破碎化日益加剧的今天,它们的生存之路危机四伏。在我国,蝙蝠的分布与数量已大大减少。据粗略估计,最近20~30年,我国蝙蝠数量大约减少了一半。有的种类,尤其是我国一些特有种和稀有种已濒临灭绝。所以,专家们建议相关部门应尽早启动蝙蝠保护工程。

据该项目的中方负责人张树义教授介绍,2004年,他带领的研究组与北京房山区霞云岭乡共同出资,在北京郊区建立了我国第一个蝙蝠研究与保护基地。该基地主要用于蝙蝠飞行的仿生动力学和蝙蝠对地磁的感应等交叉学科研究,而且已经得到北京市科委的支持。下一步在华南建立的研究基地将主要用于研究蝙蝠与所携带病原之间以及果蝠与植物之间的协同进化关系。同时,两个研究基地都担负着科学普及和专题博物馆的功能。张树义希望有意合作该项目的华南地区的保护区、旅游单位或地方机构与其联系,共同选择一个最佳地点,共建基地。(张劲硕)

## 的理想

碍。所以,一定要在中部和西部地区创造经济亮点,搞出几个重要的经济增长中心。我不主张西部开发把资金到处撒,我主张重点建设城市经济,由城市

Our major outputs have been 4 scientific papers either published or in press in refereed scientific journals on the taxonomy and ecology of Chinese bats. These are listed in Table 2 with Darwin Initiative participants highlighted in bold.

In addition, we have just submitted a manuscript describing what we believe is a new species of barbastelle bat from China. The bats were captured near the Darwin Initiative Centre.

**ZHANG, J., HAN, N.-J., JONES, G., LIN, L.K., ZHANG, J.P., ZHU, G.-J. HUANG, D.-W. & ZHANG, S.** A New Species of *Barbastella* (Chiroptera: Vespertilionidae) From North China. Submitted to *Journal of Mammalogy*, April 2007.

We feel we are on target to meet (and exceed) most of our targets for project outputs. We still need to develop a schedule for disseminating educational talks to schoolchildren during the final 14 months of the project, and to develop funding for continuation of the centre after the Darwin Initiative grant ends.

### 3.3 Standard Output Measures

**Table 1 Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
1A,B	PhD students	2	2 (continued)			
7	PowerPoint presentation 'Bats and us'		1			
8	Time spent in China	2 weeks	2 weeks			
11A,B	Papers to be published in peer-reviewed journals	2	3			
New - Project specific measures						

**Table 2 Publications**

Type *	Detail (title, author, year)	Publishers (name, city)	Available from	Cost £
Scientific paper*	<b>JONES, G.</b> , PARSONS, S., <b>ZHANG, S.</b> , STADELMANN, B., BENDA, P. & RUEDI, M. 2006. Echolocation calls, wingshape, diet and phylogenetic diagnosis of the endemic Chinese bat <i>Myotis pequinus</i> .	Acta Chiropterologica, 8: 451-464.		
Scientific paper*	<b>LI, G.</b> , <b>JONES, G.</b> , ROSSITER, S.J., CHEN, S.F., PARSONS, S. & <b>ZHANG, S.</b> 2006. Phylogenetics of small horseshoe bats from East Asia based on mitochondrial DNA	Journal of Mammalogy 87: 1234-1240.		

	sequence variation.			
Scientific paper*	THABAH, A., <b>LI, G.</b> , WANG, Y., LIANG, B., HU, K., <b>ZHANG, S.</b> & <b>JONES, G.</b> Diet, echolocation calls and phylogenetic affinities of the great evening bat <i>Ia io</i> (Vespertilionidae): another carnivorous bat.	Journal of Mammalogy, in press.		
Scientific paper	<b>LI, G.</b> , WANG, Y., ZHAO, H., HELGEN, K.M., LIN, L., <b>JONES, G.</b> & <b>ZHANG, S.</b> Echolocation calls, diet, and phylogenetic relationships of Stoliczka's trident bat <i>Aselliscus stoliczkanus</i> (Hipposideridae).	Journal of Mammalogy, in press.		
Popular Press	<b>ZHANG, J.</b> Article about Darwin Initiative funded work	China Nature		
Popular press*	<b>ZHANG, J.</b> Article about Darwin Initiative funded work	Science Times		

### ***3.4 Progress towards the project purpose and outcomes***

We feel that we are making good progress towards achieving the project purpose and outcomes.

### ***3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits***

We feel the project will contribute to better describing biodiversity in China, educating schoolchildren about the need to conserve bats, and will raise the profile of science in China. Professor Jones has already been approached by scientists in the USA and Germany about the content of the species descriptions website.

### ***Monitoring, evaluation and lessons***

Quality of publications can be assessed by their acceptance in peer-reviewed journals. Five of our manuscripts has already been accepted, and has attained our benchmark of expected quality. We will monitor the numbers of schoolchildren who pass through the education centre in the coming year.

## ***4. Actions taken in response to previous reviews (if applicable)***

Last year the reviewer acknowledged (point 2) that the change in siting of the education centre was unavoidable. The Project Purpose should state that the bat centre in Beijing is for the promotion of bat conservation in China (not southern China only as in original application). There is no need to visit Guangzhou any longer. We hope that dissemination of conservation information to other areas of China can be achieved through our website and through our articles in popular science journals.

(3) The opening of the education centre in Beijing has now been achieved, and milestones were provided in the last 6-month report.

(4) Contact with the conservation centre in Hong Kong is still ongoing, though see (2) above for dissemination of information across China.

(5) Post-project sustainability: the education centre and the research centre have been purchased, so there are no further capital building costs involved. Professor Zhang assures me that the centres can remain open after the Darwin Initiative grant ends with funding from his research grants and from local government.

**5. Other comments on progress not covered elsewhere**

We need to develop a more detailed schedule for school visits to the centre.

**6. Sustainability**

The project is being covered by at least two national popular science papers. The scientific publications are being read internationally. The Darwin Centre was mentioned in a letter to the journal Science by Professor Zhang regarding voucher specimens for bats known to harbour SARS-type coronaviruses. The project is contributing to Professor Zhang establishing a major research group studying bat biodiversity in China.

**7. Project Expenditure**

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


Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget.

**8. *OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes***

We feel that the scientific outputs of the project have been strong, and our manuscript currently under review will describe a new species of Chinese bat, described from a site close to the Darwin Initiative Centre for Bat Conservation where work on this species was conducted.

## Annex 1 *Report of progress and achievements against Logical Framework for Financial Year: 2006/07*

<i>Project summary</i>	<i>Measurable Indicators</i>	<i>Progress and Achievements April 2006-Mar 2007</i>	<i>Actions required/planned for next period</i>
<p><b>Goal:</b> To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <p>The conservation of biological diversity,</p> <p>The sustainable use of its components, and</p> <p>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</p>			
<p><b>Purpose</b> <i>(insert original project purpose statement)</i></p> <p>Promotion of bat conservation in China by establishment of a bat conservation centre in Beijing. From the centre we will increase public awareness about bat conservation, improve identification of Chinese bats, and establish baseline data to assess population changes in Chinese bat populations.</p>	<p><i>(insert original purpose level indicators)</i></p> <p>Completion of Darwin Initiative Centre for Bat Conservation by yr 1.</p> <p>Education dissemination strategy implemented by year 1.</p> <p>Education material disseminated by yr 3.</p> <p>Bat identification key completed by yr 3.</p>	<p><i>The Centre for Bat Conservation has been contributed to (museum displays etc.) and a separate education centre has been purchased in a nearby school. Presentations have been developed, and the first talks to schoolchildren implemented. Online information about 30 bat species has been uploaded. Baseline data on bat populations in cave sites is being collected by Zhang Jinshuo.</i></p>	<p><i>Change in siting of education centre resulted in a delay to this aspect of the project. Need to plan school visits for next 14 months, and determine ways of continuing work after Darwin Initiative grant ends.</i></p>

	Baseline data on bat populations in cave sites.		
<i>Outputs</i>			
<p>Foundation and running of Darwin Initiative Centre for Bat Conservation.</p> <p>Identification key for Chinese bats (Chinese and English versions): online version to include echolocation calls and DNA sequences.</p> <p>Baseline data on population sizes of cave-dwelling bats.</p> <p>Education packages for teachers and children.</p> <p>Lessons learned and best</p>	<p>Building completed staffed, displays and education material developed.</p> <p>Key published in a peer-reviewed journal. Online version accessible. One PhD student being trained.</p> <p>Population estimates published in scientific journal. One PhD student being trained.</p> <p>Visits to Centre by teachers and classes. Estimated 50 school visits by yr 3, and 'pyramid' teaching by educating teachers and allowing PhD students to train undergraduates, who will then visit schools.</p>	<p><i>Buildings completed and purchased, education officer employed.</i></p> <p><i>5 papers published or in press, one more submitted on ecology and taxonomy of Chinese bats. 2 PhD students employed. Echolocation calls collected and DNA sequenced from ca. 30 species to date.</i></p> <p><i>Roost counts being collected, and PhD student employed.</i></p>	<p><i>Further work on website planned when PhD students visit again, probably September 2007.</i></p> <p>Some shift in interests of student Jinshuo Zhang from population studies to biodiversity assessment.</p>

practices disseminated	<p><i>CCTV documentary broadcast by yr 3. Radio broadcasts, articles (3+) in popular science magazines (e.g. National Geographic China).</i></p>	<p><i>2 popular science articles published or in press.</i></p>	<p>Need to get TV companies interested in final year.</p>
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## Annex 2 *Project's full current logframe*

### LOGICAL FRAMEWORK

19. Please enter the details of your project onto the matrix using the note at Annex B of the Guidance Note. This should not have substantially changed from the Logical Framework submitted with your Stage 1 application. Please highlight any changes.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</p>			
<p>Purpose</p> <p>Promotion of bat conservation in southern China by establishment of a bat conservation centre in Beijing. From the centre we will increase public awareness</p>	<p>Completion of Darwin Initiative Centre for Bat Conservation by yr 1.</p> <p>Education dissemination</p>	<p>Opening ceremony involving Chinese co-funders.</p> <p>Biannual meetings of project partners and all</p>	<p>Chinese funding partners remain committed.</p>

<p>about bat conservation, improve identification of Chinese bats, and establish baseline data to assess population changes in Chinese bat populations.</p>	<p>strategy implemented by year 1.</p> <p>Education material disseminated by yr 3.</p> <p>Bat identification key completed by yr 3.</p> <p>Baseline data on bat populations in cave sites.</p>	<p>participants, including Chinese co-funders.</p>	
<p>Outputs</p> <p>Foundation and running of Darwin Initiative Centre for Bat Conservation.</p> <p>Identification key for Chinese bats (Chinese and</p>	<p>Building completed staffed, displays and education material developed.</p> <p>Key published in a peer-reviewed</p>	<p>Biannual meetings of project partners and all participants.</p> <p>Publication after peer review, PhD</p>	

<p>English versions): online version to include echolocation calls and DNA sequences.</p>	<p>journal. Online version accessible. One PhD student trained.</p>	<p>student examined. Access statistics to website. Publications lodged with Darwin Initiative.</p>	<p>Students of sufficient calibre located. Publications subject to peer review.</p>
<p>Baseline data on population sizes of cave-dwelling bats.</p>	<p>Population estimates published in scientific journal. One PhD student trained.</p>	<p>Publication after peer review, PhD student examined. Publications lodged with Darwin Initiative.</p>	
<p>Education packages for teachers and children.</p>	<p>Visits to Centre by teachers and classes.  Estimated 50 school visits by yr 3, and 'pyramid' teaching by educating teachers and allowing PhD students to train</p>	<p>Questionnaires about attitudes of children to bats before and after education programmes.</p>	

<p>Lessons learned and best practices disseminated</p>	<p>undergraduates, who will then visit schools.</p> <p>CCTV documentary broadcast by yr 3. Radio broadcasts, articles (3+) in popular science magazines (e.g. National Geographic China).</p>	<p>Viewing, circulation statistics.</p>	
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## **Annex 3**

Reprints of 4 papers sent with report.

## Checklist for submission

	Check
<b>Is the report less than 5MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> putting the project number in the Subject line.	✓
<b>Is your report more than 5MB?</b> If so, please advise <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> that the report will be send by post on CD, putting the project number in the Subject line.	
<b>Do you have hard copies of material you want to submit with the report?</b> If so, please make this clear in the covering email and ensure all material is marked with the project number.	✓
Have you completed the Project Expenditure table?	✓
Do not include claim forms or communications for Defra with this report.	✓