

## *Darwin Initiative Annual Report*

### Darwin Project Information

Project Ref Number	15/033
Project Title	Monitoring bat biodiversity: indicators of sustainable development in Eastern Europe
Country(ies)	Romania, Bulgaria
UK Contract Holder Institution	Institute of Zoology, Zoological Society of London
UK Partner Institution(s)	The Bat Conservation Trust
Host country Partner Institution(s)	The Romanian Bat Protection Association, The Green Balkans, The Nature Park Roussenski Lom, Bulgarian Academy of Sciences, The Bulgarian Bat Research and Protection Group
Darwin Grant Value	£179,029
Start/End dates of Project	1 <sup>st</sup> May 2006 – 31 <sup>st</sup> April 2009
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 <sup>st</sup> April 2007- 31 <sup>st</sup> March 2008. Annual Report 2.
Project Leader Name	Kate E. Jones
Project website	<a href="http://www.ibats.org.uk">http://www.ibats.org.uk</a>
Author(s), date	Kate E. Jones, Colin Catto, Abigel Szodoray-Paradi, Elena Tilova

### 1. Project Background

Our project develops national bat monitoring programmes in two countries in Eastern Europe (Romania and Bulgaria, see Fig. 1) in order to generate long-term data on biodiversity indicator species to assess the impact of national development and global change. Project delivery is through volunteers that are recruited in-country and trained to the requisite project standard. This approach is designed both to increase the number of people with effective bat conservation skills and knowledge and also to enable delivery of long term monitoring cost-effectively. Working with existing in-country networks, our project offers training in bat monitoring, develops suitable monitoring protocols and training materials, and monitors selected bat species using recordings of bat echolocation calls along national road networks.

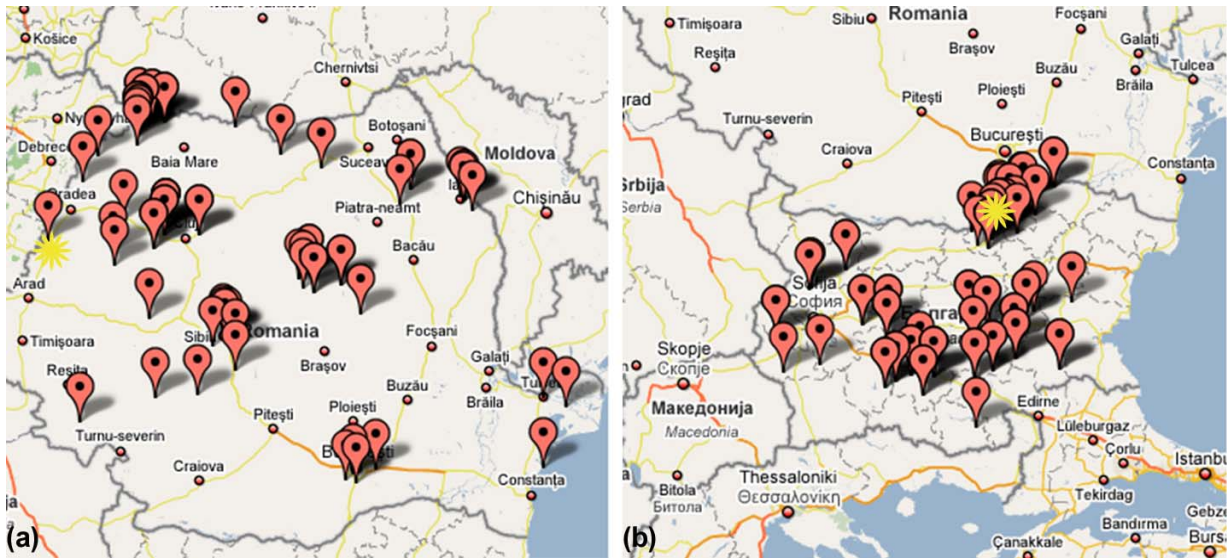


Fig.1 – Map of 2007 workshops (yellow stars) and monitoring transects (pink markers) for Romania (a) and Bulgaria (b).

## 2. Project Partnerships

### Project Partnerships

*Partnership between UK lead institution and host country partner(s).* The Zoological Society of London (ZSL) has strengthened the links with our Romanian and Bulgarian collaborators over the project's second year. We co-organised a second training workshop and feedback meeting for the Romanian partners (Romanian Bat Protection Association – RBPA) in Cefa, Romania (Fig.1a) in May 2007. As well as providing feedback to the existing project participants, we also involved a further 6 volunteers trained to monitor bat biodiversity. One of the volunteers was based in neighbouring Hungary and the RBPA were able to build their capacity in this region. RBPA are also planning on expanding the survey into neighbouring Moldova next year.

In Bulgaria, we strengthened our initial contact with Elena Tilova from The Green Balkans and organised and delivered their first training workshop in May 2007 to 19 volunteers in Tabachka, (Fig.1b), involving representatives from The Bulgarian Bat Research and Protection Group, The Nature Park Roussenski Lom and The Institute of Zoology: Bulgarian Academy of Sciences. This strengthened host country capacity by building links between these organisations and unifying them under the same project.

*Partnerships between other UK or regional partner(s)?* The partnership between the Zoological Society of London (ZSL) and The Bat Conservation Trust (BCT) has brought together excellent science and volunteer management skills to create a unique citizen science monitoring project which neither organisation could deliver on their own. The relationship between these organisations is excellent and we have regular meeting to review project progress. BCT invited Dr. Kate Jones to act as their scientific advisor at the EUROBATs Intersessional Meeting in Hungary, where she gained publicity for further developing the iBats project across Europe and received a number of expressions of interest from other European countries. BCT also asked Dr. Kate Jones to be a member of the Steering committee to develop a Pan European monitoring program and setting up a Bat Life Europe. She has also taken a leading role with BCT in developing bats as headline biodiversity indicators for UK Government's SEBI2010 Indicators.

ZSL has built its own capacity as a project leader by adding value to the existing proposal through a PhD student project at ZSL and University College London (Alanna Maltby) to develop a global echolocation call database which will help identify species collected within the project. We are also working closely with a PhD student at Bristol University (Alice Hughes) to develop ecological niche models from the project's distribution data. ZSL has further developed

its relationship with the Data Management Centre at Newcastle University by receiving in kind technical support for the website and its continued development and maintenance costs.

### **Other Collaboration**

The project has made formal linkages with the existing Bats and Roadside Mammals Survey in the UK, run by Mammals Trust UK and BCT. We are planning to incorporate their data this coming year into the Darwin project's online portal. Volunteers and the project manager (Dr. Jon Russ) will be able to use the website to manage, store and analyse their data. We are further extending the project with a Darwin Scoping Award to Mongolia Dr. Nyambayar Batbayar (Wildlife Science and Conservation Center of Mongolia) later this year, where we will discuss the development of a mammal monitoring program for this country. We have started up pilot bat monitoring projects for this year using this technique in Madagascar (Dr. Richard Jenkins, Madagasikara Voakajy), Mexico (Dr. Griselda Segura,, University of Campeche, both projects funded by ZSL), New York (Dr Chanda Bennett, American Museum of Natural History funded by Black Rock Forest Consortium, New York) and Thailand (Dr. Sara Bumrungsri Prince of Songkla University, funded by British Ecological Society and EDGE).

We are also working with Dr. Stuart Parsons (University Auckland) to develop automatic analysis of call data and neural network identification systems. We have developed a formal international bat call consortium with the aim of collating and making available online a global bat call library.

In May 2007, ZSL organised an international workshop (funded by Conservation International, \$25,000) on developing global bat monitoring protocols in Conservation International's Tropical Ecology Assessment and Monitoring (TEAM) sites ([www.teaminitiative.org](http://www.teaminitiative.org)). This has led to two papers that are in preparation (Parsons *et al.* development of a global network for monitoring bats in tropical forests: from concepts to implementation and Jones *et al.* Bats as indicators).

The RBPA and The Green Balkans have identified their CBD focal points (Mrs Ana Maris Comanoiu and Ms Maria Karadimova

and will send further details about the project and its progress. RBPA has also developed links with a Habitat Management and Road mitigation planning project in Romania and Bulgaria funded by the Dutch government. This project looks at the implementation of roadside designs on biodiversity in the region. The Darwin project is nicely seen to compliment this initiative as the Darwin project would provide data on which the project could use to inform policy makers.

## **3. Project progress**

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

**Project Outputs:** (1) *Establishment of statistically defensible long-term monitoring protocols for Romania and Bulgaria*

This year saw the incorporation of Bulgaria (The Green Balkans) into the project and their monitoring protocols were designed and translated and the monitoring equipment was bought and transferred to them.

**Project Outputs:** (2) *Network of host country personnel trained in monitoring techniques, equipment and analysis*

We held our second workshop in Cefa, Romania (Fig.1a) in May 2007. We moved the Romanian workshop from March to May 2007 because it made more logistical sense to run the Romanian and Bulgarian workshops consecutively. The ZSL/BCT assisted RBPA to run the workshop inviting a total of 14 participants. The first day provided feedback to the existing volunteers from the activities and results from last year with additional advanced training. The other 3 days were spent training 7 new volunteers. All training material and monitoring

protocols were written and uploaded to the project website and translation into both Romanian and Hungarian is ongoing. 2 additional sets of monitoring equipment were bought for the Romanian project, in addition to replacement parts and other consumables.

In total since the beginning of the project, RBPA has recruited 77 volunteers with 59 of these volunteers taking part in a survey transect (see Table 1). Since 2006, data from 72 transects (Fig. 1) have been collected covering 2371 km (20 in 2006 across 610 km and 52 in 2007 across 1761 km). RBPA has also expanded the project to Hungary where they have 17 volunteers 12 of which have collected survey data from 8 transects over 184 km. RBPA also did a pilot transect in Croatia in September 2007.

Project	Events	Routes	Monitoring Routes	Volunteers	Survey Volunteers	Km Driven
iBatsRomania	72	52	13	77	59	2371.77
iBatsBulgaria	74	46	27	54	36	2694.23
iBatsHungary	8	6	2	17	12	184.5
iBatsCroatia	1	1	0	6	3	31.65

Table 1. Project summaries downloaded from the iBats online data portal – 28/04/2008.

Following the Romanian workshop we then went to Tabachka in Bulgaria (see Fig. 1b) for the first Bulgarian workshop. We trained 21 volunteers from The Green Balkans in survey techniques and volunteer management. Training materials and protocols were all translated into Bulgarian before the workshop and we had simultaneous translation at the workshop. The Bulgarian team designed their own monitoring protocols with advice from the UK personnel. 7 sets of monitoring equipment plus support materials were bought and donated to the Bulgarian project. The Bulgarian team organised a press launch in Ruse a day before the workshop to publicize the event which got wide national coverage. The first year pilot data collection was extremely successful; with the volunteers from The Green Balkans collecting 74 transects covering 2694 km (see Fig 1). From the initial 21 trainees, there are now 54 people registered to the project, with 36 of having collected survey data.

**Project Output:** (3) *Ongoing online international spatial and temporal database on bat species abundances and distributions alongside road networks*

The project database website is now fully operational. The database is hosted within an ASP.net framework and this allows users to upload their survey data and download and analyse their collected data. It also allows project leaders to manage their projects, volunteers and report on progress. We host the website at The Data Management Centre in Newcastle University and the Romanian and Bulgarian sonograms and associated metadata collected by the volunteers has been uploaded onto their servers. We have analysed all sonograms from 2006 and the 2007 analysis is currently ongoing.

**Project Output:** (4) *Knowledge on how road design and the change in human development and climate impacts bat biodiversity*

Analysis of the project sonograms from 2007 is still ongoing and once complete we will start developing climate and ecological niche models to investigate the influence of habitat and climate on bat distributions and abundance.

### 3.2 Progress towards Project Outputs

**Project Outputs:** (1) *Establishment of statistically defensible long-term monitoring protocols for Romania and Bulgaria*

We have made good progress on this output as we have developed the protocol guidelines for Romania and Bulgaria, which have been distributed to the monitoring network and translated. The protocols have been successfully trialed in 2006 in Romania and rolled out in 2007 across both Romania, Bulgaria and to parts of Hungary and Croatia, delivering presence and abundances of bats across this region.

**Project Outputs:** (2) *Network of host country personnel trained in monitoring techniques, equipment and analysis*

We have also made good progress on this output as we have recruited a network of 154 volunteers across the region (Romania, Hungary, Bulgaria and Croatia, see Table 1). We were initially concerned about the lack of an established bat network in Bulgaria and the availability of volunteers for this project there. However, by linking up with The Green Balkans, we have been able to use their established network of biodiversity volunteers to a huge success. We have finalised the training material for the surveys and sonogram analysis which is all uploaded to the website.

**Project Outputs:** (3) *Ongoing online international spatial and temporal database on bat species abundances and distributions alongside road networks*

Roadside survey data has been collected from 5280 km across the region since 2006 and has all been uploaded to the web database. The data and metadata collected have all been checked in quality and the analysis of the sonograms for 2007 is in progress.

**Project Output:** (4) *Knowledge on how road design and the change in human development and climate impacts bat biodiversity*

Analysis of the habitat and climate associations of bats will be ongoing over the coming year.

### 3.3 Standard Measures

**Table 1 Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	Total to date	Total planned from application
Established codes					
5	Key personnel and a minimum of twenty volunteers trained to survey and monitor bats, interact with the online database, extract and interpret data	23	131	154	Key personnel + 20 volunteers
7	Training manual and material (x2), monitoring protocol manual (x2), 1 database design and analysis manual (x1)		5	5	5

8	30 weeks leading in-county workshops and field work	1 workshop, 2 meetings & 20 transect surveys	2 workshops & 135 transect surveys	3 workshops, 2 meetings & 155 transect surveys	30 weeks leading in-county workshops and field work
9	Road design best practice manual for the National Road Authority and other interested NGO's (x2). Report on the effects of development (x2)			Ongoing	4
10	Identification guide to bats along roadsides using echolocation calls (x2)		2	2	2
12A	Online database of bat distributions from transect data and echolocation calls	1		1	1
13A	Echolocation call libraries for roadside bats (x2)			Ongoing	2
14A&B	Workshop at end of project (x1), international conference presentations (International Bat Conference and Society of Conservation Biology)	1 (Cambridge University International Student conference)	2 (International Bat Conference Mexico, Bat Conservation Trust Conference)	3	2
15AB&D	Annual national and local press releases in each host country and UK local press release at start of project	2 Romanian and 1 Bulgarian press release	1 UK and 1 Bulgarian press release	1 UK, 2 Romanian and 2 Bulgarian press releases	5
17A&B	Development and enhancement of biodiversity monitoring network (x2)	Project team in Romania and 21 volunteers and Project team in Bulgaria	Project team in Bulgaria and 131 volunteers	Project team in Romania & Bulgaria and 154 volunteers	Development and enhancement of biodiversity monitoring network (x2)
20	Computer equipment, detectors and software (£20,000)	£6000 spent on 6 sets of equipment to Romania. The project agreed	£2000 spent on 2 sets of equipment to Romania, £7000 spent	£16000	£16000

		with Darwin to shift the remaining £4000 into salaries for the development of the web database	on 7 sets of equipment for Bulgaria plus £1000 on software		
23	Confirmed (£134,439), proposed Rufford (£20,000), BCI Global Grass Roots fund (£5000), FFI Flag ship species fund (£5,000), People's Trust for Endangered Species Fund (£5000)	Matched funding from ZSL; \$1000 Bat Conservation International; £10,000 from Romanian Government to RBPA; £1000 Cambridge University; \$25,000 Conservation International TEAM; £10000 Rufford Foundation	Matched funding from ZSL; £1000 ZSL; £1000 The Royal Society; £6,300 The Rufford Foundation	Matched funding from ZSL; \$1000 Bat Conservation International; £10,000 from Romanian Government to RBPA; £1000 Cambridge University; \$25,000 Conservation International TEAM; £16300 Rufford Foundation; £1000 ZSL; £1000 The Royal Society	Confirmed (£134,439), proposed Rufford (£20,000), BCI Global Grass Roots fund (£5000), FFI Flag ship species fund (£5,000), People's Trust for Endangered Species Fund (£5000)
New - Project specific measures					

In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed, eg title, name of publisher, contact details, cost. Mark (\*) all publications and other material that you have included with this report.

**Table 2 Publications**

Type *	Detail	Publishers	Available from	Cost £
(eg journals, manual, CDs)	(title, author, year)	(name, city)	(eg contact address, website)	
Online Manual	Instructions for using the iBats website	iBats	<a href="http://www.ibats.org.uk/page.aspx?tabid=277">http://www.ibats.org.uk/page.aspx?tabid=277</a>	Free
Online Manual	Monitoring protocol	iBats	<a href="http://www.ibats.org.uk/page.aspx?tabid=256">http://www.ibats.org.uk/page.aspx?tabid=256</a>	Free
Online Manual	Sound analysis protocol	iBats	<a href="http://www.ibats.org.uk/page.aspx?tabid=">http://www.ibats.org.uk/page.aspx?tabid=</a>	Free

			270	
Online Manual	Bat Call guide	iBats	<a href="http://www.ibats.org.uk/page.aspx?tabid=271">http://www.ibats.org.uk/page.aspx?tabid=271</a>	Free
Online Database	Database of georeferenced bat calls	iBats	<a href="http://www.ibats.org.uk">http://www.ibats.org.uk</a>	Free but access limited to project participants

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

The project's purpose is to generate long-term population data on biodiversity indicators to assess the impact of global change by developing bat biodiversity monitoring programmes for two countries in Eastern Europe. We are on target to deliver this as the progress of our measurable indicators is as planned or have been more successful than planned. For example, at the end of the second year of the project it has surveyed 5280 km across the region using 154 volunteers (originally estimated at 200km over 3 years using 20 volunteers) with all bat encounters being analysed and stored in the purpose-built online database. This demonstrates that good progress has been made on the projects purpose of generating data through a network of trained monitoring personnel, which will be developed into a monitoring programme over the subsequent years

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

The first stage of measuring impact on biodiversity is to establish where the relevant biodiversity is currently present. Good progress has been made on this, as evidenced by the successful survey of 5280 km of roads across the region and the transference of necessary skills, knowledge and equipment to these volunteers. This also demonstrates good progress towards sustainable long term monitoring.

## **4. Monitoring, evaluation and lessons**

Important lessons learnt on this project so far include the importance of building this project into the activities of an existing country NGO that has access to a network of potential volunteers and is stable within that country. This is the only way of developing sustainable monitoring networks that can deliver long-term monitoring data. The project design has, in our view, been critical to the success (as evidenced by the number of transects driven) of the project and could serve as a good example for future volunteer programmes. The employment of time expansion detectors, where bat calls are recorded onto mini disc for subsequent sonogram analysis, means that survey volunteers do not require intensive training in bat identification. Volunteers are trained on setting up the equipment, driving the transect and uploading data onto the database. This reduces barriers to participating in the project and means that anyone who wants to become involved in bat conservation, has access to a vehicle and receives training and equipment can participate. This enables them to make a significant contribution to bat conservation with relatively little training.

Some volunteers wish to develop their bat knowledge and skills further and these volunteers can be given training in sonogram analysis. This requires more intensive training and results in these volunteers developing good bat knowledge and skills. Thus the project design enables different levels of commitment from volunteers and this makes it attractive to volunteers with a wide range of abilities. The endpoint is that large datasets can be delivered over a short period



of time and, with sonogram analysis, quality-assured data that results in robust monitoring. Critical to the success of the project is the in-country volunteer managers who recruit and manage the volunteers, organise training workshops and take the project to a wider audience. Both in-country managers have made an immense contribution through recruitment and excellent management of committed volunteers and this has been central to the smooth running of the project enabling the UK partners to concentrate on transferring the necessary skills and knowledge effectively.

However the success of the volunteer productivity has produced some challenges for the project, namely in the increase in the number of transects driven and the subsequent increase in sonogram analysis time required. The two management systems in the project model designed to deal with sonogram analysis i.e. development of online database and recruitment/training of volunteer sonogram analysers, have been strained with the vastly higher than anticipated number of transects surveyed. This means that, so far, only a percentage of the total transects have been analysed although we have planned the analysis to ensure all volunteers who have taken part to date will receive feedback on their efforts. However the database is now running smoothly and more volunteer sonogram analysers have been recruited and will be trained at the 2008 workshops. This approach will ensure all sonograms are analysed by the end of this year.

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

*1. Feedback:* I wonder how confident the team are about holding onto volunteers in the long term: have any people dropped out who were trained initially? The actual training workshops take three days, which seems very big commitment for volunteers. Is it possible to encourage short introductory workshops for people new to bats?

*Response:* Everyone that is trained in the project can train someone else and this has happened in both Romania and Bulgaria (see the numbers of volunteers the UK personnel trained compared to the number now registered with the projects and taking part in the surveys). This knock-on recruitment will accommodate any drop out. Also feedback is critical to retain volunteers and progress is reported on the website instantly an update is made to the database and this goes to all project members. Also each workshop has a day that gives feedback from the previous year's survey to last year's volunteers.

Shorter workshops also are useful and are being carried out by the RBPA already, encouraging general interest in bats. We hope that these types of workshops would be carried out by local groups who already have the expertise to do this. For Bulgaria there is more of need for short introductory courses and we are working with the Bulgarian project leader to build this into the workshop for this year.

*2. Feedback:* Additional contacts with other NGO's in Bulgaria should be made if possible.

*Response:* We have four contacts in Bulgaria already, The Green Balkans, The Nature Park Roussenski Lom, Bulgarian Academy of Sciences, The Bulgarian Bat Research and Protection Group. This seems stable and is working well. We are not sure what is to be gained by adding more NGO's at this stage.

*3. Feedback:* I note that the newly published protocols will be translated but how has the issue of language been addressed for training of volunteers, apart from this? It is important to ensure all training workshops and materials are available in the relevant languages to maximise accessibility for volunteers.

*Response:* All the materials for the Bulgarian workshop were translated into Bulgarian and we had simultaneous translation. The translation for the Romania workshop is ongoing but is less of a problem because the majority of the volunteers speak English.

4. *Feedback:* There have been 3 press releases: has there been any monitoring of the response to these? Is there any sense of raised public awareness, ie not only in academic circles?

*Response:* Project delivery is by volunteers most of whom are not in academic circles. Word of mouth between friends/ colleagues is a powerful method for raising awareness. One example we can give from Romania is where a volunteer told a birding friend (no previous experience with bats) about the survey and he immediately volunteered to take part. As the survey is carried out by car often friends/relatives accompany the surveyors and this gives them their first experience of hearing bat sounds through a detector.

4. *Feedback:* Transport costs were double what was expected: will this be a repeating problem for future years?

*Response:* This is an artefact of the way that ZSL codes the budgets. It lumps all workshop and transports costs together – so reports on both the project budget lines together. So the costs were as expected.

## **6. Other comments on progress not covered elsewhere**

The original methods as proposed have proved robust and successful. We have made small enhancements to equipment as a result of feedback from surveyors and a more objective method of identifying bats encountered in the recorded sonograms has been developed. This refinement should enhance long term monitoring sensitivity as it reduces background 'noise' in the dataset.

Looking at the Romanian data for this year, we think they should focus more effort on the period of maximum bat activity (July and August) and be less concerned about the other months. We will discuss this with the Romanians in the next workshop and emphasise the significance of this on the statistical robustness of the monitoring data.

Sonogram analysis is very time consuming and detailed and there is a concern about the sustainability of this analysis workload after the project funding is finished. Further training is needed for the volunteers and we working with expert sound scientists to automate this process (Dr. Stuart Parsons) and to produce identification keys. We are currently investigating how many transects you would need to do to have the power to detect population trends. This will help to identify the key priorities survey targets for the future surveys. Data storage and maintenance of the website is also an issue and we need to generate more funding for this from other sources.

## **7. Sustainability**

The project has raised the profile of bat biodiversity monitoring at governmental levels through both the RBPA securing some matched funding from the Romanian Government to contribute to this project, and developed links with a Habitat Management and Road mitigation planning project for both Romania and Bulgaria. The project has increased the capacity of trained biodiversity monitoring personnel in Romania and Bulgaria through our workshops and equipment. Because we are working with large established NGO's in both Romania and Bulgaria we hope that this makes the monitoring project sustainable to deliver long-term monitoring data. Both Romania and Bulgaria are Parties to the EUROBATS Agreement and a fundamental obligation of EUROBATS is to establish monitoring programmes for bats. Both in-country managers are in discussion with their EUROBATS representatives to try and get the project officially recognised and hopefully this may lead to long term government support.

## **8. Dissemination**

This year the project has been widely disseminated through a number of media. ZSL published an article in the Darwin Newsletter about this project, which is circulated to all Darwin projects.

ZSL issued a national press release which was picked up by papers in London (The Metro) and online. The Green Balkans had a press conference and release at the start of their project which received national press and radio coverage. Kate Jones presented the project at The Bat Conservation Trust's National Conference in September and at the International Bat Conference in Merida, Mexico in August.

## 9. Project Expenditure

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

Item	Budget (please indicate which document you refer to if other than your project application)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

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

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

This project uses existing NGO's to deliver biodiversity monitoring at a national and an international level, using a novel monitoring technique. We have recruited 154 volunteers in 4 countries in Eastern Europe monitoring a total of 5280 km for the acoustic calls of bats. We have developed a state-of-the-art online web data portal within which the project can be managed and the data stored and analyzed. We have managed to generate matched funding for the project from National governments and other funding agencies and transferred our biodiversity skills and equipment. We have also generated interest from other countries and conservation organisations around the world in using this technique to develop monitoring projects.

[I agree for ECTF and the Darwin Secretariat to publish the content of this section](#) (please leave this line in to indicate your agreement to use any material you provide here)

## Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p><b>Goal:</b> <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>		<p>We have started to map out the bat biodiversity in Romania, Bulgaria, Hungary and Croatia and build a network of trained personnel that can deliver long term monitoring data and sustainable development.</p>	<p><i>(do not fill not applicable)</i></p>
<p><b>Purpose</b> To generate long-term population data on biodiversity indicators to assess the impact of global change by developing bat biodiversity monitoring programmes for two countries in Eastern Europe</p>	<p>Online database of abundances and distribution of roadside bats in Romania and Bulgaria</p> <p>Network of monitoring personnel maintaining a long-term programme in each country</p> <p>Production of manuals of good practice in road design to enhance biodiversity and effect of development</p>	<p>Online database completed and holding all project's data.</p> <p>Trained network of 154 volunteers and key personnel from Romania, Bulgaria, Hungary and Croatia.</p> <p>Online protocol manuals and database</p>	<p>Further collection for 2008 of bat abundance and distribution</p> <p>Further workshop in Bulgaria</p> <p>Analysis of the distribution and abundance data collected across the region</p>
<p><b>Output 1.</b> Establishment of statistically defensible long-term monitoring protocols for Romania and Bulgaria</p>	<p>Protocol guidelines manual for each host country</p>	<p>Developed protocol guidelines for Romania and Bulgarian. Protocols trialled in 2006 have been successfully rolled out and implemented in 2007 across the region delivering presence and abundances of bats.</p>	

<p><b>Output 2.</b> Network of host country personnel trained in monitoring techniques, equipment and analysis</p>	<p>Key personnel and 10 volunteers trained in survey methods</p> <p>Further workshops run by host countries</p> <p>Training materials produced</p>	<p>We have recruited a network of 154 volunteers across the region in monitoring techniques and equipment. We ran one workshop in Romania and Bulgaria and all training material and protocol manuals are completed and online.</p>
<p>Activity 2.1. Workshop in May 2007 in Cefa, Romania</p>		
<p>Activity 2.2. Workshop in May 2007 in Tabachka, Bulgaria</p>		
<p><b>Output 3.</b> Ongoing online international spatial and temporal database on bat species abundances and distributions alongside road networks</p>	<p>Roadside survey data from 200km of transect collected from each host country and uploaded to database</p> <p>Website and database are developed</p>	<p>Roadside survey data has been collected from 5280km of roads across the region and uploaded to the online database.</p>
<p>Activity 3.1. May – October 2007 monitoring by Romanian, Bulgarian, Hungarian and Croatian volunteers</p>		
<p>Activity 3.2. Development of the online data portal</p>		
<p><b>Output 4.</b> Knowledge on how road design and the change in human development and climate impacts bat biodiversity</p>	<p>Statistical analysis of quantity and quality of roadside bat biodiversity along a range of road side types in host countries</p> <p>Statistical analysis of time series survey data with change in development and climate</p> <p>Annual report on roadside</p>	<p>Statistical analyses will be carried out in the next year.</p>

	biodiversity index.	
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## Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<b>Goal:</b> <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</b> <ul style="list-style-type: none"> <li>• the conservation of biological diversity,</li> <li>• the sustainable use of its components, and</li> <li>• the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<b>Purpose</b>			
To generate long-term population data on biodiversity indicators to assess the impact of global change by developing bat biodiversity monitoring programmes for two countries in Eastern Europe.	<p>Online database of abundances and distribution of roadside bats in Romania and Bulgaria.</p> <p>Network of monitoring personnel maintaining a long-term programme in each country.</p> <p>Production of manuals on good practice in road design to enhance biodiversity and effect of development.</p>	<p>Website and database available online and continuing annual data entry from host countries.</p> <p>Training manuals and reports and research results published in peer reviewed journals.</p>	<p>Host countries can recruit and maintain a sufficient volunteer network.</p> <p>Host countries willing to share data.</p>
<b>Outputs</b>			
Establishment of statistically defensible long-term monitoring protocols for Romania and Bulgaria	Protocol guidelines manual for each host country.	Distribution of manuals to monitoring network.	Protocols will deliver monitoring (risk reduced based on previous successful surveys carried out in the U.K. and Republic of Ireland).
Network of host	Key personnel and 10 volunteers trained in	Contact details of volunteers and workshops	Ability of host countries to

country personnel trained in monitoring techniques, equipment and analysis.	survey methods.  Further workshops run by host countries.  Training material produced.	recorded.  Training material available for download from project website.	recruit volunteers (risk reduced as Romania has already recruited some volunteers).
Ongoing online international spatial and temporal database on bat species abundances and distributions alongside road networks.	Roadside survey data from 200 km of transect collected from each country and uploaded to database.  Website and database are developed.	Verification of the quality and quantity of survey data. GPS log can be used to verify position of recordings.	Survey data is collected correctly.  Website can be accessed by host countries.
Knowledge on how road design and the change in human development and climate impacts bat biodiversity.	Statistical analysis of quantity and quality of roadside bat biodiversity along a range of road side types in host countries.  Statistical analysis of time series survey data with change in development and climate.  Annual report on roadside biodiversity index.	Production of peer-reviewed papers and production of annual report to policy makers.	Sufficient data is collected for analysis
<b>Activities</b>	<b>Activity milestones (summary of project implementation timetable)</b>		<b>Assumptions</b>
Protocol & Equipment Development	Monitoring protocols designed and equipment procured. Yr 1: Romania, Yr 2: Bulgaria		Equipment is obtained and protocols work.
Training/Workshops	Yr 1: 1 <sup>st</sup> workshop to initially train key Romanian personnel in survey techniques, call analysis, volunteer recruitment. 2 <sup>nd</sup> workshop run by Romanian personnel offering training to survey		Volunteers are willing and capable of being trained.



	volunteers. Development of training material. Yr 2: 3 <sup>rd</sup> workshop run to train key Bulgarian personnel in survey techniques and volunteer management methods. 4 <sup>th</sup> workshop run by trained Bulgarian personnel to train Bulgarian volunteers. Yr 3: Joint Romanian/Bulgarian/UK workshop to provide feedback and identify future funding	
Field Research Programme	Yr 1: Pilot survey data collected by Romanian key personnel. Yr 2: Survey data collected by network of Romanian volunteers and pilot data collected by Bulgarian key personnel. Yr 3: Survey data collected by Romanian and Bulgarian volunteers.	Volunteers are trained and collect the required data.
Database Development & Spatial Analysis & Modelling	Yr 1: Development and design of online database to host project data. Romanian pilot data uploaded and initial analysis. Yr 2: 2 <sup>nd</sup> Yr Romanian data uploaded and analysed. Bulgarian pilot data uploaded and analysed. Yr 3: 3 <sup>rd</sup> Yr Romanian, 2 <sup>nd</sup> Yr Bulgarian data uploaded and analysed. Examine 3 years of data for Romania to examine effect of global change on bat biodiversity.	Website and online database are established correctly and maintained.
Project Reporting	Yrs 2-3: Production of guidelines to maximize biodiversity for roadside managers in Romania and Bulgaria. Report effect of human development on bat biodiversity in Romania using three years of data.	Sufficient data is collected for the spatial analysis and modelling.

### ***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.	
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<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.	