



Darwin Initiative Annual Report



Important note:

To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be about 10 pages in length, excluding annexes

Submission Deadline: 30 April 2013

1. Darwin Project Information

Project Reference	19-003
Project Title	A sustainable future for Chinese giant salamanders
Host Country/ies	China
UK contract holder institution	Institute of Zoology, Zoological Society of London
Host country partner institutions	Kunming Institute of Zoology (KIZ), Shaanxi Normal University (SNU), Guiyang University (GU)
Other partner institutions	Chengdu Institute of Biology (CIB), Yunnan Science & Technology Centre (YSTC), Hunan Fisheries Science Research Institute (HFSRI), Yangtze River Fisheries Research Institute (YRFRI)
Darwin Grant Value	£300,374
Start/end dates of project	1 July 2012 – 30 June 2015
Reporting period (eg Apr 2012 – Mar 2013) and number (eg Annual Report 1, 2, 3)	April 2013 – March 2014 Annual Report 2
Project Leader name	Andrew Cunningham
Project website	www.chinesegiantsalamanders.org
Report authors, main contributors and date	Andrew Cunningham, Shu Chen 30 th April 2014

2. Project Background

The world's largest amphibian, the Critically Endangered Chinese giant salamander (CGS; *Andrias davidianus* - Cryptobranchidae), is highly evolutionarily distinct. The CGS lineage has evolved independently for 170 million years and includes just two other surviving species (*Andrias japonicus* and *Cryptobranchus alleganiensis*). Occupying a range that encompasses mountain tributaries of the Pearl, Yellow and Yangtze Rivers across 17 provinces in China, the CGS has experienced a severe range-wide decline in the wild since the 1960s. This decline appears to be mainly due to overexploitation for food. The recent development of a rapidly growing CGS farming industry might have exacerbated this, as wild CGS are illegally caught to stock farms. Also, catastrophic disease outbreaks on farms, apparently mainly due to ranavirus infection, have compounded the problem through the restocking of farms with wild-caught animals. It is also possible that pathogens spread from farmed to wild salamanders (and other amphibians) via untreated farm effluent and government-endorsed but misguided conservation initiatives releasing farmed CGS have contributed to the decline of this species. The CGS is also threatened by habitat destruction, fragmentation and degradation, environmental contaminants and, as it is mostly found at high altitudes (up to 1,500 metres), this species is potentially vulnerable to climate change. Dynamic conservation action is thus urgently required to ensure this species continues to survive in the wild.

3. Project Partnerships

This project is led by Professor Andrew Cunningham, Institute of Zoology ZSL, in collaboration with a group of organisations in China, each with a specific and equally important role to play. MoUs have been signed between ZSL and each institute and a Letter of Agreement has been

signed amongst all partner institutions. Professor Ya-ping Zhang and Dr. Jing Che at the Kunming Institute of Zoology (KIZ, Chinese Academy of Sciences) lead on CGS population genetics to provide scientific guidance for future *in situ* conservation management and to inform possible *ex situ* conservation breeding and re-introduction. Professor Gang Wei at Guiyang University (GU) leads on conducting field surveys and questionnaires to better understand the current distribution and abundance of this species in the wild and any changes in perceived or actual threats to the CGS. Professor Minyao Wu at Shaanxi Normal University (SNNU) leads on the investigation of disease threats to the CGS, both in the wild and from the large and growing CGS farming industry.

During 2013/14, additional institutions became formal collaborators of the project. In order to conduct national field and questionnaire surveys of CGS across its native range and to build the first robust database of its distribution, status and threats, ZSL has established partnerships with the Chengdu Institute of Biology (CIB, Chinese Academy of Sciences), the Yangtze River Fisheries Research Institute (YRFRI) and the Hunan Fisheries Science Research Institute (HFSRI), which is affiliated with the Ministry of Agriculture and Fisheries Management Bureau. MoUs have been signed with each of these three new collaborating institutions.

ZSL manages the overall project; providing direction and expert guidance; overseeing project capacity building; conducting and managing Communication, Education and Public Awareness (CEPA) activities in partnership with Yunnan Science and Technology Centre (YSTC); and creating tailored training programmes with our Chinese partner organisations for in-country conservation scientists who are implementing the CGS work (hereafter EDGE Fellows; please see www.edgeofexistence.org) and relevant project staff.

A Chinese Project Coordinator, Shu Chen, is managing project activities in China, including facilitating in-country collaborations between partners. Progress is monitored and evaluated day-to-day by the Project Coordinator and is regularly reported to the Project Leader, Andrew Cunningham, who takes overall responsibility for tracking project execution against the Measurable Indicators and thus monitoring progress towards the timely delivery of the project outputs. In addition, the Project Leader and key partner organisation representatives have established a Project Steering Group (PSG). Regular communications/meetings of the PSG take place electronically (email), and two physical meetings of the PSG occurred in Project Year 2; in Tongren and Xi'an. The PSG provides supervision to EDGE Fellows and assesses project performance, allowing in-country skills/capacity development to be monitored and any training issues/needs to be identified. In 2014, Dr. Michael Lau, Senior Head of Local Biodiversity and Regional Wetlands Programme at WWF-Hong Kong, was appointed as an independent assessor to oversee, guide and advise on project progress.

Project relationships in China continue to be cultivated and developed among relevant government bodies (e.g. Fisheries Management Bureaux, Forestry Bureaux and Environment Bureaux), the CGS farming community, protected area managers, and wider stakeholder circles. Links to relevant government agencies are essential to this project's long-term impact and viability as all project outcomes must be endorsed by the Chinese government. Professor Minyao Wu (SNNU) has developed contacts with key government representatives from the Division of International Organizations & Conventions in the Department of International Cooperation at the Ministry of Environmental Protection (China's CBD liaison) and the Endangered Species Import and Export Management Office of the People's Republic of China at the State Forestry Administration (China's CITES liaison). He is also a Scientific Advisor to the Ministry of Agriculture's Fisheries Management Bureau of Shaanxi Province, establishing contacts and links to CGS farms and government and facilitating the development of a sustainable CGS farming industry in Shaanxi. As a high-ranking Academician of the Chinese Academy of Sciences, Professor Ya-ping Zhang at KIZ is extremely well connected politically, and Professor Gang Wei at GU and Professor Feng Xie at CIB are working closely with the Guizhou and Sichuan provincial governmental bodies, respectively. As the UK lead institution, ZSL is an international hub of excellence in the conservation of amphibians, and hosts world-class researchers and conservationists contributing considerable expertise to this project. Since 2013, ZSL has established firm collaboration with, and garnered political support from, Guizhou Fisheries Management Bureau, Guizhou Environmental Bureau and Fanjingshan National

Nature Reserve (a key protected area for wild CGS in Guizhou Province), facilitating long-term CGS conservation planning and actions in Guizhou.

Through building capacity among the public, government and conservationists, we anticipate that this project eventually will have a lasting impact on CGS conservation, on China's ability to respond to the amphibian extinction crisis and on the implementation of CBD/CITES objectives nationally. Crucially, this project highlights the CGS as a symbol of healthy freshwater ecosystems in conjunction with the United Nations Decade of Education for Sustainable Development, and builds capacity to address the emerging problems of climate change and infectious disease spread. This project utilises British expertise and international networks to support collaborative implementation of the CBD (Articles 5-19)¹ by Chinese government agencies and institutions; the development of key Conservation Action Plan recommendations and works to implement the CBD in the context of both threatened species and inland water ecosystems.

¹ **Specific CBD issues:** Article 5 (Cooperation); Article 6 (General measures for conservation and sustainable use); Article 7 (Identification and monitoring); Article 8 (*In-situ* conservation); Article 9 (*Ex-situ* conservation); Article 10 (Sustainable use of components of biological diversity); Article 11 (Incentive measures); Article 12 (Research and training); Article 13 (Public education and awareness); Article 14 (Impact assessment and minimising adverse impacts); Article 15 (Access to genetic resources); Article 16 (Access to the transfer of technology); Article 17 (Exchange of information); Article 18 (Technical and scientific cooperation); Article 19 (Handling of biotechnology and distribution of its benefits); taking an integrated ecosystem approach wherever appropriate.

4. Project Progress

4.1 Progress in carrying out project activities

Output 0 Project management, monitoring and reporting activities

- ♦ Strong networks and project relationships within China for the *in situ* conservation of the CGS in more range provinces have been further cultivated and developed, with Chengdu Institute of Biology (CIB, survey and monitoring in Sichuan and Chongqing), Hunan Fisheries Science Research Institute (HFSRI, survey and monitoring in Hunan) and Yangtze River Fisheries Research Institute (YRFRI, survey and monitoring in Hubei, Jiangxi and Zhejiang Provinces). Also, we developed a collaboration with the Shanxi Wocheng Ecology and Environment Research Institute (SWEERI, survey and monitoring in Shanxi).
- ♦ Two physical meetings of the Project Steering Group (PSG) occurred in Project Year 2 (in Tongren, Guizhou Province in May 2013 and in Xi'an, Shaanxi Province in January 2014). In particular, PSG welcomed a new member – Professor Xie Feng from CIB, a well-known and highly respected Chinese herpetologist, to facilitate the project. These PSG meetings provided an opportunity for all key project staff from across China to review project progress to date, provide feedback, guidance, monitoring and oversight of this wide-ranging project and jointly set the direction of future work, including CGS survey plans for 2014 and 2015. Specifically, a Letter of Agreement regarding multi-institutional collaboration and agreed responsibilities was signed by PSG members.
- ♦ Meetings were held, and close liaison was developed, with key governmental officials from Guizhou Environment Bureau, Guizhou Fisheries Management Bureau, Fanjingshan National Nature Reserve and Shaanxi Fisheries Management Bureau, on the purpose of capacity building on CGS *in situ* & *ex situ* conservation and on in-country fundraising to support conservation sustainability for this species. Although meetings with central governments in Beijing have not been organised, local/provincial governments are liaising with, and reporting the project needs & conservation outputs to, the central government. Particularly, a policy letter highlighting the existing threats posed to wild CGS and farming was accepted by the Guizhou Fisheries Management Bureau and Guizhou Ministry of Agriculture, and these governmental bodies agreed to facilitate and support CGS conservation programmes holistically across Guizhou province.

- ◆ Additional funds, facilitated by ZSL, were successfully secured to ensure project sustainability, including:
 - 1) A grant of CNY 480,000 (c. £48,000) was obtained by GU from the National Natural Science Foundation of China for a study entitled “Study on giant salamander in caves and on the ground in Guizhou province”. This grant supports CGS field surveys in Guizhou Province, 2013 to 2016.
 - 2) A grant of CNY 600,000 (c. £60,000) was obtained by SNNU from the Ministry of Education for CGS international research collaboration, 2014 to 2016.
 - 3) A grant of £35,000 (over two years) was made by a philanthropist (who wishes to remain anonymous) to support the work of the CGS project EDGE fellows.

The following grant proposals, which are currently under review, were submitted by the Project Investigator and Project Coordinator:

- 1) “Determining the status and distribution of the Critically Endangered Chinese Giant Salamander” (HK\$ 203,883/£15818), submitted to the Ocean Park Conservation Foundation, Hong Kong (OPCFHK).
 - 2) “Determining the current distribution of, and threats to, the Critically Endangered Chinese giant salamander” (US\$25,000/£15045), submitted to the Mohamed bin Zayed Species Conservation Fund.
 - 3) “Build the first conservation breeding & education facility for the Chinese giant salamander in Fanjingshan National Nature Reserve” (CNY 8,100,000/£794,118), submitted to the Guizhou Environment Bureau and Fanjingshan National Nature Reserve Administration.
 - 4) “Determining the status and distribution of the Critically Endangered Chinese Giant Salamander” (£33,505), submitted to the ZSL Mission Opportunities Fund.
- ◆ The Project Coordinator, Shu Chen, received training in conservation techniques, project planning and management from the 2013 Conservation Tools Training Course by ZSL’s EDGE of Existence Programme (November 2013 in Kenya). Cascade training has been provided to other in-country EDGE Fellows (ongoing). A blog was written by Shu Chen about the training course on the EDGE website (<http://www.edgeofexistence.org/edgeblog/?p=7442>)
 - ◆ Three scientific papers were submitted to peer-reviewed journals, as follows:
 - 1) Cunningham, A. A., Turvey, S. T., Zhou, F., Meredith, H., Guan, W., Liu, X., Sun, C., Wang, Z.W. & Wu, M. The development of the Chinese giant salamander (*Andrias davidianus*) farming industry in Shaanxi Province, China: conservation threats and opportunities. *Oryx* submitted.
 - 2) Yuan, P., Wei, G., Li, S., Chen, S., Milner-Gulland, E.J., Cunningham, A.A. & Turvey, S.T. Using local ecological knowledge to identify spatial priorities for Chinese giant salamander conservation in Guizhou Province, China. *Oryx* submitted.
 - 3) Tapley, B., Okada, S., Redbond, J., Turvey, S.T., Chen, S., Lü, J., Wei, G., Wu, M., Pan, Y.1, Niu, K. & Cunningham, A.A. Failure to detect the Chinese giant salamander (*Andrias davidianus*) in Fanjingshan National Nature Reserve, Guizhou Province, China. *Salamandra* submitted.

Output 1 Evidence-base on CGS distribution, population status, ecology & conservation requirements strengthened and disseminated

- ◆ In order to develop multi-stakeholder range-wide CGS surveys, we convened an International CGS Conservation Field Training Workshop (ICGSCFTW) in Fanjingshan National Nature Reserve – a key CGS protected area in Guizhou Province – in May 2013. With input from a multi-institutional team from within and outside China (including experienced Japanese giant salamander researchers from Japan), a scientifically robust

CGS national survey strategy and standardised protocols were developed, to determine the current distribution, status, and threats impacting wild populations across its historical range in China and to collect swab samples to conduct conservation genetic analysis and pathogen surveillance. This involves conducting independent methods to determine the current distribution and status of CGS: (1) visual encounter field surveys, (2) trapping surveys, (3) questionnaire surveys of local villagers, and (4) questionnaire surveys of local fisheries and forestry officials. Any CGS caught will be measured (range of morphometrics) and swabbed to collect material for population genetics and pathogen determination. In addition, questionnaire and swabbing surveys of CGS farms local to our field survey sites will be conducted to determine possible conservation threats and opportunities from the farming industry. We aim to survey 100 field sites (Figure 1), comprising: 50 sites of best habitat detected using niche modelling (Figure 2) and 50 randomly-selected sites at which the species was historically reported (Figure 3). This being considered the optimal strategy to detect the presence of this understudied species in as scientifically robust a way as financial, logistical and political constraints will allow. A full workshop report in English and a detailed standardised survey manual in Chinese were produced as outputs from the workshop.



Figure 1. 100 selected sites for field and village questionnaire surveys

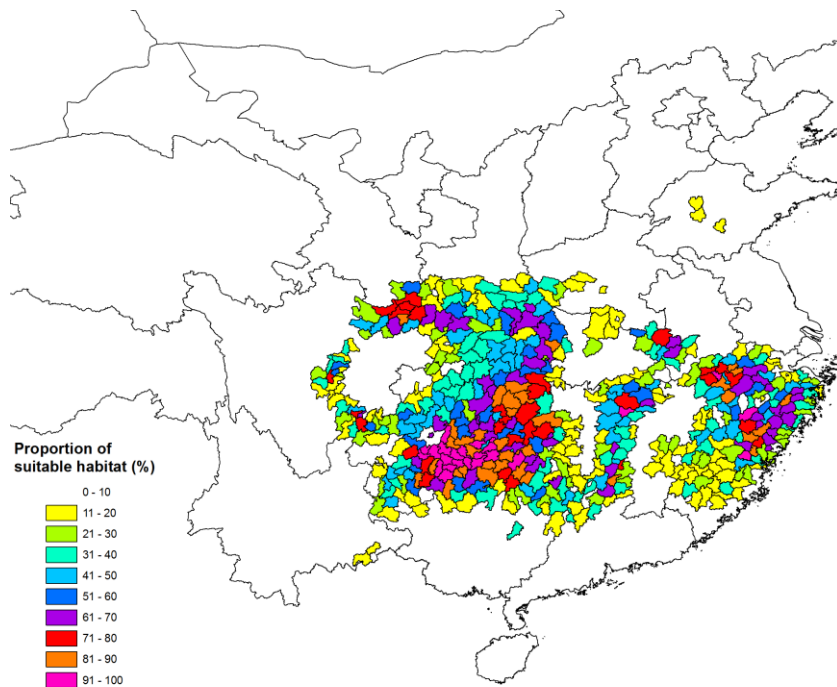


Figure 2. Coverage of suitable habitats of counties (counties are categorised into color groups based the proportion of suitable CGS habitats they possess)

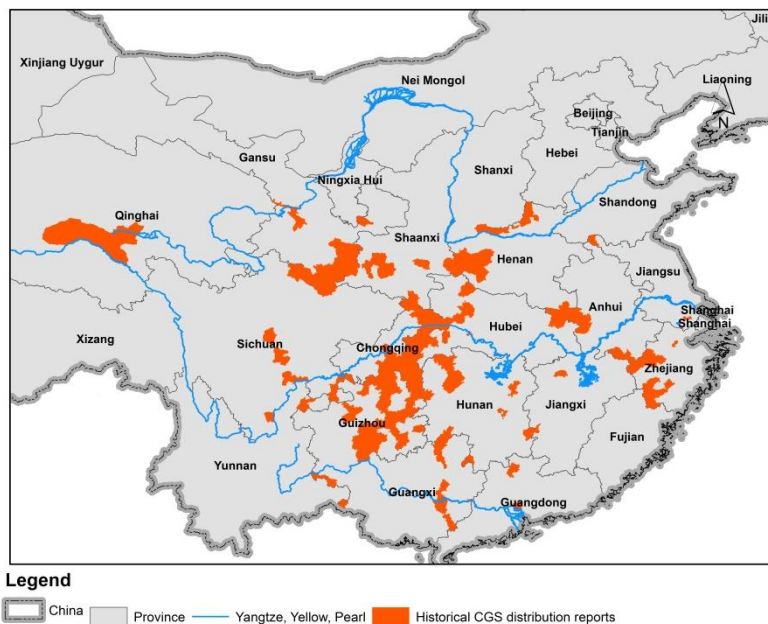


Figure 3. Counties with historical CGS distribution records

- ◆ Following the classroom phase of the ICGSCFTW, at which the survey design and methods and the questionnaires were developed and agreed, we held a one-week field training session for the members of the local survey teams. This enabled the field protocols and questionnaire protocols developed for the range-wide CGS survey to be trialled in Fanjingshan National Nature Reserve and Mayanghe National Nature Reserve, Guizhou Province (May 2013). EDGE fellows, Protected Area Staff and Chinese project partners were trained by UK and Japanese herpetologists on conducting standardised surveys & long-term monitoring throughout the country. The head of ZSL's herpetology department, Ben Tapley, published a blog to describe his training trip to China at <http://www.edgeofexistence.org/edgeblog/?p=7374>. The EDGE fellow Lv Jingcan also published a blog about his experiences being trained (<http://www.edgeofexistence.org/edgeblog/?p=7202>). The findings from these initial field surveys and villager surveys were submitted to peer-review journals as below:

Yuan, P., Wei, G., Li, S., Chen, S., Milner-Gulland, E.J., Cunningham, A.A. & Turvey, S.T. Using local ecological knowledge to identify spatial priorities for Chinese giant salamander conservation in Guizhou Province, China. *Oryx* submitted.

Tapley, B., Okada, S., Redbond, J., Turvey, S.T., Chen, S., Lü, J., Wei, G., Wu, M., Pan, Y.1, Niu, K. & Cunningham, A.A. Failure to detect the Chinese giant salamander (*Andrias davidianus*) in Fanjingshan National Nature Reserve, Guizhou Province, China. *Salamandra* submitted.

- ◆ Following the training and pilot studies described above, standardised field surveys were carried out in 12 counties (Jiangkou, Fenggang, Meitan, Songtao, Yuqing, Huaxi, Xiuwen, Kaiyang, Xifeng, Tongzi and Guiding) of Guizhou Province by GU. This included ecological encounter surveys in 18 rivers, questionnaire surveys of government officials, villagers and farms, and non-invasive swab sampling of farmed CGS for genetic analysis and disease surveillance. Unfortunately, no wild CGS were found.
- ◆ Results from piloted studies and specific CGS survey work plans in 2014 by each in-country institute (including the new collaborators) were further discussed and agreed at the CGS Survey Planning Workshop, held in Xi'an, China (January 2014). Refresher survey training for established collaborators and initial training of new collaborators is planned to take place in May 2014. This will ensure that standardised protocols are followed by each survey team across China, thus enabling comparable results to be collected.

Output 2 Range-wide population genetics & phylogeography of CGS resolved to safeguard maximum genetic diversity of this species

- ◆ Genetic samples of wild-caught & captive-bred CGS held in farms were collected from Qinghai, Shaanxi, Sichuan, Hunan, Henan, Guangxi and Guizhou Provinces, greatly enhancing the genetic database at KIZ. Conservation genetic research (i.e. microsatellite and mitochondrial DNA analyses) of collected samples were conducted at KIZ (ongoing).
- ◆ Protocols for the conservation genetics study were further improved. Because most samples collected by KIZ were deciduous skin, normal PCR methods proved ineffective. PCR conditions were therefore optimised, such as the concentration of templates, primers and Mg²⁺; reaction volume; PCR enzymes (EX-Taq, Long-Taq, and TransStart FastPfu).
- ◆ To improve the resolution of the genetic analyses, 36 new microsatellite markers (10 loci designed by KIZ and 26 loci from published papers) were further tested and screened. As a result, 15 effective markers (all from published papers) were developed by KIZ and genotyped for 166 samples. Also, mitochondrial DNA (Cytb and D-loop) was sequenced. Genetic diversity, differentiation, gene flow among populations and phylogenetic patterns are now being analysed. Results from the 166 samples studied using the 13 microsatellite loci suggest that there are seven distinct groupings of CGS, which contrasts with the four major lineages observed following previous preliminary mitochondrial analyses. However, further research is required to estimate genetic diversity, and infer the population history of CGS.
- ◆ An EDGE blog (<http://www.edgeofexistence.org/edgeblog/?p=7229>) was written by Yan Fang about the discovery of a small and genetically distinct CGS population in Guangxi.

Output 3 Disease threats to farmed and wild CGS identified and mitigation strategies developed

- ◆ Standardised protocols were developed for swabbing wild and captive CGS, and the survey team were trained to undertake swabbing using frogs and farmed CGS during and following the May 2013 field training workshop. Any wild caught CGS will be swabbed for the presence of selected amphibian pathogens (i.e. ranavirus, *Batrachochytrium dendrobatidis* and *Mycobacterium* spp.).
- ◆ The project partners have made excellent progress and built trust amongst Fisheries Management Bureaux and major farming companies in Guizhou and Shaanxi Provinces. The farm questionnaire was piloted in these two provinces and finalised at the January 2014 CGS survey planning workshop, with a view to finding out to what extent wild CGS

are still taken into farms, as well as to investigate the history, husbandry, disease status, the scale of the farming industry and the extent of CGS trading amongst farms. These data will help to inform the development of recommendations for the sustainable management of this species in China. In particular, Professor Wu now works directly with the Shaanxi Fisheries Management Bureau as an expert on their advisory committee, and he is in an excellent position to help ensure improvements in the CGS farming industry to increase sustainability (e.g. provide strategies for the prevention and mitigation of disease on farms) and ultimately benefit wild populations of CGS.

- ◆ To understand the history of *Batrachochytrium dendrobatidis* (Bd, an amphibian pathogen causing global amphibian population declines) in China, skin swab samples were taken from 34 archived specimens of CGS and 140 of *Bufo bufogargarizans* (a widely distributed common amphibian species in China) in CIB. The results showed that all samples were Bd negative.
- ◆ Farms in Shaanxi Province in which disease outbreaks occurred in Project Year 2 were visited and samples were taken from dead animals for disease screening and diagnostic investigations. Of these, 86 of 130 samples were found to be ranavirus positive. Ranavirus is a significant cause of death of CGS in farms, with mass mortalities of farmed CGS occurring annually since 2010; some farms have lost up to 90% of their stock during a single disease outbreak. To assist with this work, Professor Andrew Cunningham provided training in laboratory techniques, such as cell culture for amphibian virus isolation and Ranavirus PCR. Zhou Feng has written a blog on the impacts of ranavirus infection in Shaanxi at <http://www.edgeofexistence.org/edgeblog/?p=7002>. This disease research will help to build a sustainable CGS farming industry, particularly if/when farms recognise economic advantages of effective biosecurity measures and disease mitigation, informing the farming business strategy in terms of “best-practice”. Improved biosecurity and less disease on farms will reduce disease threats to wild CGS. Also, reductions in farm losses will lead to reductions in the demand for wild CGS to be caught for restocking.

Output 4 Build upon existing CGS farming protocols & infrastructure to develop *ex situ* protocols for conservation

- ◆ Fanjingshan National Nature Reserve (FNNR), located in Tongren City of Guizhou Province, is an historically important location for wild CGS, but where overexploitation has led to a markedly depleted population. As such, and given its relatively remote location and protected status, it fulfils many criteria required for a suitable site for a restocking programme. There is both local and provincial will for the development of such a programme and to support the establishment of a conservation breeding centre (which could also function as a public education centre), and for the long-term post-release monitoring of conservation-bred animals. Good connections have been built with the Guizhou Environmental Bureau, FNNR Administration, Tongren Fishery Management Bureau, Guizhou Academics of Sciences and Tongren University. All stakeholders have expressed strong interest and motivation to support a conservation breeding & public education facility. A proposal entitled “Build the first conservation breeding & education facility for the Chinese giant salamander in Fanjingshan National Nature Reserve” was written by ZSL and has been circulated to all stakeholders involved. The details of this will be discussed at the forthcoming CGS conservation breeding planning key stakeholder meeting in FNNR, May 2014.
- ◆ With the coordination of ZSL and GU, wild-caught CGS from 6 farms around FNNR, Guizhou, were microchipped, measured for morphometric characteristics and swabbed for genetic and disease laboratory screening (ongoing). In addition, experienced Japanese Giant Salamander researcher Dr. Yuki Taguchi (Asa Zoo, Japan) trained key local fishery officials and university researchers in CGS microchipping techniques, building local capacity for the management and monitoring of any future conservation restocking programmes. This is the first time CGS have been microchipped in Guizhou and we hope the technique will become mandatory for the identification of farmed CGS. The Guizhou Provincial Fisheries Management Bureau has posted an official blog on the National Fishery Management Website, entitled “The first issue of ID cards to wild-caught CGS in Fanjingshan”, at http://www.cnfm.gov.cn/sybhzyj/zhsybh/201403/t20140303_3801657.htm. An English blog about this work was written by the Project Coordinator Shu Chen and

posted on the project website at

<http://www.chinesegiantsalamanders.org/2014/04/14/identification-cards-were-firstly-issued-to-the-wild-caught-chinese-giant-salamanders-in-guizhou-province/>.

Output 5 Education & awareness-raising activities to promote the status & conservation needs of CGS across its range at local, national & international level

- ◆ Questionnaire surveys of 904 members of the public were conducted in the capital cities of Yunnan, Shaanxi and Guizhou Provinces to establish baseline data on the conservation awareness of the public in relation to the CGS. Results of the data analysis showed that one third of the respondents did not know about CGS, but of those who did, the more they knew about the species, the more they liked it. Most reasons people gave for disliking CGS were that it is “ugly” and/or “scary”. Public CEPA campaigns are, therefore, important to increase knowledge of CGS to promote a positive attitude to the conservation of this species.
- ◆ A CGS cartoon educational booklet describing CGS biology and threats, and a series of comics featuring four stylised CGS cartoon characters were designed for use in public CEPA campaigns. The booklet may be adopted as a study aid for students by the FNNR Administration, Tongren University and Guizhou Ministry of Education. Also, Henan Education Press (a child orientated periodical) has shown interest in publishing this booklet in their 2014 summer issue.
- ◆ A Chinese version of the project website (English at www.chinesegiantsalamanders.org; Chinese at <http://cgs.zslsites.org/>), a Chinese twitter account (<http://weibo.com/cgsnini>) and a Facebook page (<https://www.facebook.com/chinesegiantsalamanders.org>) were established to promote the project and to engage the wider public in CGS conservation.
- ◆ Three school (Fig. 4) and five public educational campaigns were carried out in Yunnan and Guizhou Provinces. These campaigns included CGS CEPA talks, public-interactive activities and project poster displays. Also, a project display was established at the main entrance of YSTC (144,000 visitors annually) for a five-month period to publicise CGS conservation, and a mobile display about CGS and its conservation has been developed in collaboration with the YSTC. The latter is being displayed across Yunnan province to maximise public outreach and is expected to reach about 200,000 visitors annually. Two volunteer teams (one in Tongren, Guizhou Province, the other in Kunming, Yunnan Province) have been established to carry out cascading CEPA campaigns to maximise conservation impacts and ensure sustainability of this aspect of the project. Shu Chen has written a blog on one CEPA campaign in Kunming at <http://www.edgeofexistence.org/edgeblog/?p=7266>



Figure 4. Group photo of a school CEPA campaign in Lufeng county, Yunnan Province (September 2013). Students are showing their drawing of CGS.

- ◆ A film about the project and the need to conserve the CGS was commissioned. Wildlife documentary film-maker Darren Williams filmed the project in May 2013, featuring the field training workshop. The resulting film, entitled “Giants on the EDGE” won the BBC Earth panel’s best student film award in 2013. This 25 minute long film has been shown at a range of events and meetings to raise awareness of CGS conservation and is available on our project website: <http://www.chinesegiantsalamanders.org/2014/03/11/giants-on-the-edge/>. We are working towards getting a version produced in which the narration is in Chinese.
- ◆ An International Conservation Workshop for Giant Salamanders, organised by ZSL, was held in Tongren University on Feb 21st, 2014, Guizhou. Experiences and research progress on giant salamander conservation in Japan and China were shared and discussed among 50 attendees, including Japanese giant salamander conservationists, Tongren government representatives, Chinese academics and volunteers. This meeting strengthened the profile, understanding and networking of the project in Guizhou Province, a key province for CGS conservation.
- ◆ YSTC and Yunnan Arts University agreed to co-lead the CGS Conservation Art Design Campaign and Science Shows with ZSL in Yunnan Province, June 2014. Artworks produced will be used for a follow-up mobile exhibition in Guizhou Province and other Provincial Science Centres. Particularly, Zeng Yue, an Arts Design Masters student funded by Yunnan Arts University and also a CGS conservation volunteer, is conducting a Masters thesis entitled “Application of design in endangered species conservation – an example of the Chinese giant salamander”. A film studio called “1350” has started to film the CGS CEPA campaign in Kunming voluntarily.

Output 6 Development of a global network that seeks to conserve giant salamanders nationally & internationally

- ◆ Networks have been further built with government ministries in Project Year 2, including Environment Bureaux, Forestry Bureaux, Ministry of Agriculture Fishery Management Bureaux and Protected Areas in Guizhou, Shaanxi, Sichuan, Chongqing, Henan, Anhui, Yunnan, Hunan, Hubei, Zhejiang and Jiangxi Provinces. ZSL and Project Partners have been developing this national CGS conservation network in order to garner political and administrative support for CGS conservation, and to facilitate project work and fundraising in-country.
- ◆ Scientific presentations entitled “Disease threats to amphibian conservation”, “Conserving the Chinese giant salamanders” and “A sustainable future for Chinese giant salamanders” were given at the Chengdu Institute of Biology and at the Wuhan Institute of Hydrobiology (both Chinese Academy of Sciences institutions) in May 2013 and to the Annual Herpetological Conference organised by the Chinese Herpetological Society, 26-29th December 2013, Harbin, China.
- ◆ This CGS Darwin project was highlighted at several international meetings and organisations through scientific seminars and presentations, including a “Climate Change and Water Management” regional meeting (organised and funded by Thai Environment Institute); Singapore Zoo; IUCN Conservation Breeding Specialist Group; National University of Singapore; Japanese Giant Salamander Conservation Annual Meeting, Kyoto University; Tottori University; Asa Zoo and Japan’s Hanzaki Institute. An international network of *Cryptobrachidae* experts was established and strengthened on the aspects of CEPA, conservation breeding and *in situ* survey and monitoring.
- ◆ Ben Tapley (Head of Herpetology, ZSL) and Shu Chen visited Kyoto University, Tottori University, Asa Zoo and Japan’s Hanzaki Institute. While in Japan, they gave presentations about the CGS project and further developed the international network for giant salamander conservation. Project visits were made to China by Japanese giant salamander experts, Dr. Yuki Taguchi (Asa Zoo, Japan) and Sumio Okada (Tottori University, Japan) to assist with training Chinese partners and collaborators in CGS survey and marking techniques.

The above project activities and outputs were conducted in the manner and time planned.

4.2 Progress towards project outputs

In Year 2 (April 2013 to March 2014), the project achieved excellent progress.

Both national and international networks have been strengthened, with the addition of more governmental bodies, academic institutions and NGOs. The national academic network was strengthened with new collaborations established with CIB, HFSRI, YRFRI and SWEERI. Collaboration with government ministries was enhanced in key CGS range provinces, facilitating planning for the first large-scale *in situ* survey of wild CGS in China (which will take place in 2014/15). Also, the first robust CGS national survey strategy and standardised protocols were developed during two international field survey planning workshops (in May 2013 at FNNR and in Jan 2014 in Xi'an, China) and were successfully trialled in Guizhou Province, to obtain the first robust scientific data to determine current distribution, status and threats impacting wild CGS.

Four EDGE fellows and project partners were trained in survey techniques and general conservation skills, and twelve field sites in Guizhou were surveyed in 2013. Unfortunately no CGS were found in the wild, heightening the need to conduct further surveys to assess the current status of CGS across its range.

Protocols of swabbing wild and captive CGS to collect genetic and disease samples were developed and samples from wild-caught and captive-bred CGS in farms were analysed at KIZ (genetics) and SNNU (pathogens). More microsatellite markers were tested using more samples, with the CGS genetic database greatly enhanced at KIZ. Seven genetically distinct groupings of CGS were identified and these results will be applied to the future conservation management of the species. SNNU further examined farms at which disease outbreak occurred in Project Year 2, and ranavirus was found to be a significant cause of death of CGS in several farms. Testing archived and contemporary CGS for *Bd* failed to detect this pathogen.

Following the failure of the viability of the originally-proposed site in Shaanxi Province following infrastructure developments and the demolition of Shaanxi Wild Animal Rescue and Research Centre for road construction, major progress was made towards finding a replacement site for the construction of the first CGS conservation breeding and education facility (in FNNR, Guizhou). Key stakeholders, including governmental bodies, reserve administration and academic institutes agreed a proposal initiated by ZSL, and a multiple-stakeholder planning workshop will be held in May 2014 to move this forward.

Wild-caught CGS in farms around FNNR were microchipped and swabbed (for genetic and pathogen analyses) with the collaboration of the Guizhou Fisheries Management Bureau.

Public awareness baseline data were collected, collated and analysed and a corresponding awareness-raising strategy was developed. CEPA campaigns were conducted in Yunnan and Guizhou Provinces with CEPA information on the importance of CGS and freshwater ecosystems produced and disseminated to a wider public nationally and internationally through project networking and websites.

Most milestones under the Project Outputs were achieved in a timely fashion, but some activities have been delayed. Because a physical meeting of the PSG took place in January 2014 and because CGS are inactive before May, to maximise resources and efficient use of funding, the 2nd formal Annual Project Review Meeting of the project partner institutions was postponed to May in Guiyang, Guizhou (9-10th May 2014), prior to the field training and the conservation breeding stakeholder meeting at FNNR, Guizhou (12-18th May). In addition, construction of the pilot CGS *ex situ* conservation breeding facility has been delayed due to the relocation of the Shaanxi Wild Animal Rescue and Research Centre (SWARRC) to a new site. However, an alternative site (FNNR) was selected, garnering strong interest and support from relevant stakeholders to jointly raise additional funding to allow the construction of a larger-than-planned facility.

It is anticipated that all outcomes of this project will be realised by its close and that post-project sustainability will be achieved. Output indicators are measured by the Project Leader and the

Project Coordinator monthly to monitor the project progress of each in-country partner and to ensure all activities are carried out and research goals achieved in the time planned. The important output assumptions still hold true. Although samples have not yet been collected from free-living wild CGS due to the extremely low abundance of this species in the wild (and our failure so far to sight a wild CGS), contacts have been made with farms and Fishery Management Bureaux to obtain samples from locally wild-caught animals in farms.

4.3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
Established codes								
1A	Number of people to submit thesis for PhD qualification (in host country)							
1B	Number of people to attain PhD qualification (in host country)							
2	Number of people to attain Masters qualification (MSc, MPhil etc)							
3	Number of people to attain other qualifications (ie. Not outputs 1 or 2 above)							
4A	Number of undergraduate students to receive training	0	10			10	5	5
4B	Number of training weeks to be provided	0	20			20	20	20
4C	Number of postgraduate students to receive training	8	5			13	3	5
4D	Number of training weeks to be provided	17	14			31	9	20
5	Number of people to receive at least one year of training (which does not fall into categories 1-4 above)	4	3			7	1	3
6A	Number of people to receive other forms of education/training (which does not fall into categories 1-5 above)	13	35			48	10	30
6B	Number of training weeks to be provided	13	39			52	25	46
7	Number of (ie different types - not volume - of material produced) training materials to be produced for use by host country	3	8			11	4	7
8	Number of weeks to be spent by UK project staff on project work in the host country	11	18			29	20	50
9	Number of species/habitat management plans (or action plans) to be produced for Governments, public	0	0			0	0	2

	authorities, or other implementing agencies in the host country							
10	Number of individual field guides/manuals to be produced to assist work related to species identification, classification and recording	0	1			1	0	1
11A	Number of papers to be published in peer reviewed journals	0	0			0	1	3
11B	Number of papers to be submitted to peer reviewed journals	0	3			3	1	2
12A	Number of computer based databases to be established and handed over to host country	0	2			2	0	2
12B	Number of computer based databases to be enhanced and handed over to host country	1	1			2	0	1
13A	Number of species reference collections to be established and handed over to host country(ies)							
13B	Number of species reference collections to be enhanced and handed over to host country(ies)							
14A	Number of conferences/seminars/workshops to be organised to present/disseminate findings	2	10			12	5	15
14B	Number of conferences/seminars/workshops attended at which findings from Darwin project work will be presented/ disseminated.	4	5			9	3	8
15A	Number of national press releases in host country(ies)	0	1			0	2	6
15B	Number of local press releases in host country(ies)	0	0			0	3	9
15C	Number of national press releases in UK	0	2				1	2
15D	Number of local press releases in UK							
16A	Number of newsletters to be produced	0	0			0	2	6
16B	Estimated circulation of each newsletter in the host country(ies)	0	0			0	5,000	>25,000
16C	Estimated circulation of each newsletter in the UK	0	0			0	30,000	90,000
17A	Number of dissemination networks to be established	3	2			5	2	4
17B	Number of dissemination networks to be enhanced/extended	0	1			1	1	1
18A	Number of national TV programmes/features in host	0	0			0	1	3

	country(ies)							
18B	Number of national TV programmes/features in UK	0	0			0	0	1
18C	Number of local TV programmes/features in host country(ies)	0	0			0	2	4
18D	Number of local TV programmes/features in UK							
19A	Number of national radio interviews/features in host country(ies)	0	0			0	1	3
19B	Number of national radio interviews/features in UK	0	0			0	0	1
19C	Number of local radio interviews/features in host country(ies)	0	0			0	2	5
19D	Number of local radio interviews/features in UK							
20	Estimated value (£'s) of physical assets to be handed over to host country(ies)	1,300	5,000.			6,300	0	42,494
21	Number of permanent educational/training/research facilities or organisations to be established and then continued after Darwin funding has ceased	0	3			3	0	3
22	Number of permanent field plots to be established during the project and continued after Darwin funding has ceased	0	1			1	1	3
23	Value of resources raised from other sources (ie in addition to Darwin funding) for project work	£15,940	£185,285			£201,225	£24,000	£325,434
New - Project specific measures								

Table 2 Publications

Type (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £

4.4 Progress towards the project purpose and outcomes

In Year 2 of the project, the in-country conservation & research capacity of CGS *in situ* survey, conservation genetics, disease diagnosis & screening and public awareness-raising were greatly strengthened through tailored training programmes. Collaborations and networks were further strengthened with project partners, governments, NGOs and farms to enable data collection to inform a strategic conservation plan for the CGS. Specifically, the first standardised and integrated protocols were developed and successfully trialled to build the first robust database of CGS distribution, status and threats across its historical range and to

enhance the genetic databases and our understanding of the CGS health. CEPA strategies were developed and public campaigns were carried out in Yunnan and Guizhou Provinces. The international CGS conservation profile and the importance of freshwater ecosystems were also highlighted through scientific presentations given at international conferences, workshops and seminars.

The purpose level assumptions hold true that Project Partners in China keep effective communication & collaboration and this project gains support from the Chinese government authorities. The established national & international networks among multiple stakeholders can provide effective support & promote the sub-goal of this project. The suggested indicators remain adequate for measuring the purpose-level outcomes.

4.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

This project aims to obtain the evidence required to develop a national conservation strategy for the CGS across its natural range in the drainage basins of the Yellow, Yangtze & Pearl Rivers. The work done so far will benefit regional biodiversity through helping to ensure the protection of wild CGS habitats and through building in-country research capacity to strengthen the effective conservation of other amphibians and freshwater ecosystems. Thirty per cent of China's amphibians are threatened and 23% are Data Deficient and, with global concern over freshwater ecosystems and availability reaching crisis point, China must urgently address the protection of its freshwater resources.

In Project Year 2, close connections and networks have been further built and strengthened with government bodies in key project areas – especially in Shaanxi and Guizhou Provinces, including Fisheries Management Bureaux, Environment Bureaux and Protected Areas. Additionally, the importance and urgency to strengthen CGS wild population & habitat protection and to promote sustainability of the farming industry have been raised with these provincial governments. In particular, we have been working with the Fisheries Management Bureaux and CGS farming communities to promote better biosecurity protocols, husbandry and management (e.g. we introduced the microchipping of farmed CGS in Guizhou Province; Professor Wu has been engaged in the provincial certification and assessment of CGS farm to foster the biosecurity management in Shaanxi as the advisor on Shaanxi's CGS farming expert committee). These improvements should reduce disease risks to wild CGS and to other aquatic species and improve the security of rural livelihoods; recent catastrophic ranavirus outbreaks on CGS farms in Shaanxi have led to significant economic loss to farm communities.

In Year 2 of the project, four field teams were established and trained in the use of standardised protocols in order to conduct surveys of CGS and its habitat. Results from the national surveys will provide robust evidence to inform future conservation strategies at the national scale, such as protected area designation and conservation policy enactment. This will ultimately have long-term benefits for freshwater biodiversity and safeguard rural livelihoods.

Our complementary CEPA campaigns were conducted to raise conservation awareness of CGS and freshwater biodiversity and to facilitate conservation management at the local, national and international levels. Following our input, our project collaborator, YSTC, has been using CGS conservation as their flagship environmental education programme to disseminate the importance of CGS, amphibians and freshwater ecosystem conservation to the wider public.

5. Monitoring, evaluation and lessons

The Project Leader takes overall responsibility for tracking project execution against the Measurable Indicators and thus monitoring progress towards the timely delivery of the six project Outputs and the project Purpose. Specifically, the process of monitoring and evaluation is a team effort under the day-to-day management of the Project Coordinator and a monthly progress report is submitted to the Project Leader to consolidate tracking of performance.

Simultaneously, the EDGE Fellows are under the supervision of the PSG to monitor the progress against the institutional workplans, timetables and budgets. Regular communications/meetings of the PSG, organised both electronically and physically, ensure that

the project progress is regularly reviewed and evaluated. In addition to expert assessments and supervision provided by the in-country supervisors, the EDGE of Existence programme conducts regular meetings with EDGE Fellows via emails and Skype, facilitated by the Project Coordinator, to ensure their skills gaps are identified and addressed and that tailored training programmes are designed and provided. Specific EDGE plans, the detailed project workplan for EDGE Fellows within the overall Darwin framework, are also reviewed and supervised by the EDGE team in London on a monthly basis to provide performance appraisals against milestones and indicators, monitor skills/capacity development and adjust project activities to fulfil the Darwin outputs.

During the Project Year 2, project visits of ZSL staff and the Project Coordinator and training provided at the project sites ensured that the project activities were carried out to international standards and in a timely manner. Also, PSG meetings and EDGE fellow meetings further strengthened the collaboration amongst the collaborating institutes and enhanced group oversight, accountability and monitoring on the overall project.

A recent development has been the appointment of Dr. Michael Lau as an independent assessor and advisor of the project and we look forward to working with him on this exciting and ambitious project.

6. Actions taken in response to previous reviews (if applicable)

The review of last annual report:

- 1) *The Darwin Initiative is not being suitably recognised.*

Response: During the Project Year 2, the Darwin logo and name have been prominent in all publicity relating to the project, including in all project materials (i.e. reports, protocols and CEPA materials), on the project website (<http://www.chinesegiantsalamanders.org/people-and-partnerships/>), in the project-affiliated public engagement and education campaigns, such as the mobile project display co-organised by the YSTC across Yunnan Province (reach about 200,000 visitors annually), and in all workshops, meetings, conferences and publications nationally and internationally.

- 2) *There is a lack of detail/examples provided by the Project to give the confidence that the progress is satisfactory, and that the quality of outputs are at an appropriate standard.*

Response: In the Project Year 2, project reports and preliminary research results are provided as the indicator of the achievements of this project. Also, in year 2, we have taken on an independent assessor of the project, Dr. Michael Lau, Senior Head of Local Biodiversity and Regional Wetlands Programme at WWF-Hong Kong. This is a recent appointment, so there is no report as yet from Dr. Lau. He will, however, attend PSG meetings and advise on any areas of the project that need attention, including by remote assessment.

- 3) *The training needs of EDGE Fellows/trainees seem very similar based on the skill-audits.*

Response: The skill audits to EDGE Fellows in the first year were aiming to examine their general understanding of conservation issues and the level of their general conservation skills. In Project Year 2, the UK EDGE team has further helped EDGE Fellows to develop their specific EDGE plans and research focuses, and identified specific training needs with respect to individually-required outputs.

7. Other comments on progress not covered elsewhere

The design of the overall project was greatly enhanced during the Project Year 2. The planned CGS surveys have been expanded from the regional scale in key project areas to the national scale, allowing for a much more comprehensive understanding of the current status of CGS in the wild and the threats faced by this species. The CGS survey protocols (including questionnaires) were piloted and refined incorporating inputs from national and international experts. There were no significant difficulties or particular risks facing the project this year, although unfortunately, no CGS have yet been found in the wild to sample for population genetics or pathogen investigations. We have, however, developed sampling protocols for CGS

farms and samples from wild-caught and captive-bred farmed animals have been taken and analysed.

Copies of the protocols and questionnaires, MoUs, Letter of Agreement, educational materials, documentary film and other outputs will all be provided on disk with the Final Report, but are available on request should the Darwin Initiative wish to review them at this stage.

8. Sustainability

Through this project, conservation capacity in China among project partners/stakeholders is being improved, particularly in amphibian and wider freshwater ecosystem conservation but also in conservation biology in general. Capacity for project planning has also been strengthened, which will benefit the development of future Chinese collaborative conservation partnerships and enhance the long-term contribution of ZSL and other overseas conservation NGOs to address vital conservation issues in China.

Firstly, EDGE Fellows (prospective conservation leaders) and key project partners were trained in conservation tools to lead biodiversity research and conservation programmes in China. The research and conservation capacity built amongst project staff and their institutions will, hopefully, sustain this project in the long run and also have a positive impact on the conservation of other species. Secondly, through this project, we have engaged with multiple academic institutions and governmental bodies in China, and in-country funds (£108,000) have been raised to support CGS conservation actions and research. It is anticipated that more funds will be raised within China to support follow-up activities. Thirdly, staff within the Guizhou Fisheries Management Bureau have been trained to use microchips to help better-manage farmed stocks of CGS, and Shaanxi Fisheries Management bureau staff have been working closely with Professor Wu to improve biosecurity practice on farms to foster a sustainable CGS farming industry. We anticipate that the involvement of Chinese provincial governments will facilitate the sustainability and impact of this CGS conservation project. Fourthly, following the loss of our initial site for the proposed flagship conservation breeding centre in Shaanxi Province, a new partner in the FNNR has been found to foster the development of this project. This appears to be endorsed by the Guizhou provincial government and the location is ideal for a conservation breeding, reintroduction and CEPA programme for the CGS. Finally, the CGS CEPA campaigns (incorporating freshwater ecosystem conservation) have been adopted as a long-term flagship environmental project of YSTC, which will help to disseminate our project results and impacts widely over a sustained period.

9. Dissemination

We use our project website as a tool for disseminating information about the project and the need for CGS, amphibian and freshwater ecosystem conservation. In Year 2, we established a Chinese version of our project website and we have been promoting this in-country to the public, government agencies and NGOs. Another major achievement during Year 2 was the production of a documentary film about the project and CGS conservation. This film, which won an award from the BBC, has been shown at several events and meetings and is planned to be shown at future conferences in the UK and in China. Also, it is available on the project website. The film is narrated in English, but we hope to produce a mandarin version to increase the reach of the film within China.

During our CEPA campaigns and through our excellent collaboration with YSTC, protected areas and schools, information about the CGS, amphibian conservation and freshwater ecosystems has been disseminated to the urban public, students and rural communities. Existing networks and volunteers (trained through a cascade training process) have carried out this dissemination and continue to do so within China. Also, it seems likely that the government of Guizhou Province will adopt our CEPA booklet as environmental education material for schools and tourists. The YSTC has been using (and will continue to support) CGS CEPA as their environmental education template, which will strengthen the project and CGS conservation profile locally and nationally (especially as YSTC is closely liaising with other provincial Science and Technology Associations and is likely to disseminate our educational materials for use in other provinces). In addition, scientific presentations were given to, and

connections were made with, multiple international institutes to disseminate project information and results.

As so much time has been spent on these, and other, aspects of the project, we have not yet produced a project newsletter. In many ways the website and blogs (most of which are also published on the EDGE website) take the role of a newsletter, but we are planning to produce an electronic project newsletter in Year 3. Unlike many other countries, in China it is not possible to send out press releases about project updates (e.g. embarking on the largest survey of a Critically Endangered species in the country) until the information has been gathered, analysed and published. This has held back our timetable for project dissemination via press releases.

10. Project Expenditure

Table 3 project expenditure during the reporting period (1 April 2013 – 31 March 2014)

Item	Budget (please indicate which document you refer to if other than your project application or annual grant offer letter)	Expenditure	Variance/ Comments
Staff costs specified by individual			
Project Co-ordinator (Chen Shu)			Although IoZ UK pay point criteria were applied, the project coordinator was recruited on a lower salary than initially envisioned. DI approved viring monies saved from this to operational and/or travel costs.
EDGE Fellow (Lv Jing-Cai)			
EDGE Fellow (Zhou Feng)			
EDGE Fellow (Yan Fang)			
Wu Minyao (SNNU)			
Andrew Cunningham (IoZ)			
EDGE coordinator (ZSL)			
Overhead costs			
Travel and subsistence			This includes £782 vired from salary costs and allowed extra in-country travel to be undertaken to help with project networking.
Operating costs			This includes £6,416

			vired from salary costs.
Capital items/equipment (specify)			
Others: Consultancy			
Others (please specify) Project website			
TOTAL			

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

I agree for LTS 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 2013-2014

Project summary	Measurable Indicators	Progress and Achievements April 2013 - March 2014	Actions required/planned for next period
<p>Goal: <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> <ul style="list-style-type: none"> ⇒ The conservation of biological diversity, ⇒ The sustainable use of its components, and ⇒ The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 		<p>In-country capacity built to conduct CGS and freshwater biodiversity research and conservation; connection built with the Provincial Fisheries Bureau and farms in Guizhou and Shaanxi Province to underpin and develop a sustainable farming industry; national survey strategies developed to inform freshwater biodiversity protection; and CEPA campaigns conducted to raise the profile of CGS and the importance of freshwater ecosystems.</p>	
<p>Purpose Building the evidence-base & capacity to underpin, promote & conduct a strategic conservation plan for the CGS.</p>	<p>First robust dataset of population distribution, relative abundance and threat distribution across key range areas & genetic connectivity • Improved in-country resources & capacity for addressing both in situ & ex situ conservation concerns, including: monitoring protocols; population genetics database & biobanked material; disease diagnostic protocols; conservation breeding protocols; CEPA strategy and 2 campaigns; & the establishment of an effective national & international network to support & promote the sub-goal.</p>	<p>Standardised field survey & monitoring protocols developed and successfully piloted in Guizhou, with field teams trained; genetic database & the understanding of CGS diseases enhanced; In-country research capacity of field surveys, conservation genetics and disease strengthened; the planning proposal to construct the 1st CGS conservation breeding and education facility in FNNR supported by multiple stakeholders. Conservation profile of CGS improved through CEPA campaigns and at regional, national and international conferences & workshops; Networks with the Chinese governments enhanced.</p> <p>Assumptions: Effective communication among project partners; continued supports from the Chinese government authorities.</p>	<p>Standardised CGS population surveys in Guizhou, Anhua, Henan, Yunnan, Sichuan, Chongqing, Hubei, Jiangxi and Zhejiang Province; Genetics database strengthened and disease threats identified to provide evidence bases for future conservation breeding and reintroduction; Conservation breeding protocols developed; ongoing CEPA campaigns; National & international network enhanced.</p>
<p>Output 1. Evidence-base on CGS distribution, population status, ecology & conservation requirements</p>	<p>Scientifically robust baseline data for CGS occurrence/abundance in range-wide study regions collated, analysed & reported • Predictive Habitat Model developed, that factors-in Climate Change, to delimit a suitable remaining range area for CGS to inform future</p>	<p>Standardised and integrated field survey and questionnaire survey protocols developed and successfully piloted to determine the current & historical distribution, threats and population status of wild CGS across China; Historical range of wild CGS in China mapped and national survey strategies developed with 100 sites identified; field surveys in 12 counties of Guizhou conducted; EDGE Fellows and key project partners trained at FNNR. Two papers of survey results submitted to peer-review journal.</p>	

strengthened & disseminated.	conservation breeding release efforts & establish potential locations of remnant populations • Questionnaire-based survey protocols developed & utilised to collect local informant data on current / historical range • Standardised field survey programme developed & utilised • 1 CGS survey & monitoring EDGE Fellow trained.	Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 1.1. Conduct training visits to Guizhou Provinces with three EDGE Fellows		The Conservation International Field Training Workshop for CGS was held in FNNR, Guizhou (May 2013), with EDGE fellow, project partners and protected area staff trained with survey protocols and skills by international herpetologists from UK and Japan. To provide further training in May 2014 at FNNR towards all partners (including new established field teams) to ensure standardisation across sites.
Activity 1.2. Develop standardised questionnaire-based survey protocol		Standardised questionnaire survey protocols towards county-level governmental officials, rural communities and farms developed and piloted. To conduct standardised questionnaire surveys in Guizhou, Hunan, Anhui, Henan, Yunnan, Sichuan, Chongqing, Hubei, Jiangxi and Zhejiang Province.
Activity 1.3. Develop standardised field survey protocol		Standardised field survey protocols developed and piloted. To conduct standardised field surveys in Guizhou, Hunan, Anhui, Henan, Yunnan, Sichuan, Chongqing, Hubei, Jiangxi and Zhejiang Province.
Activity 1.4. Conduct long-term monitoring at selected field site		Field surveys conducted in 12 counties of Guizhou Province with habitat information collated. To conduct field survey in other 21 sites and select suitable sites for long-term monitoring.
Activity 1.4. Train and supervise EDGE Fellow focusing on long-term monitoring of wild CGS in Guizhou at GU, Shaanxi at SNNU, Sichuan and Chongqing at CIB, and Henan, Anhui and Yunnan at KIZ		EDGE Fellow and key project partners trained in survey & long-term monitoring of wild CGS in their project areas. To provide on-going training and supports by ZSL to build in-country capacity to conduct effective in situ CGS survey and monitoring.
Output 2. Range-wide population genetics & phylogeography of CGS resolved to safeguard maximum genetic diversity of this species.	CGS Genetics Group established to coordinate collection, analysis, storage, databasing & dissemination of genetic information to facilitate conservation management and sustainable production of wild CGS • Field collection of CGS genetic samples across known range • Microsatellites developed & databased to enable the analysis of genetic samples • Genetic analysis of samples, investigating phylogeography, & identifying distinct evolutionary units & possible evidence for cryptic species • Biobanking of genetic	New microsatellites tested at KIZ, protocols for conservation genetics refined and lab work & analysis conducted on CGS genetic samples collected from different provinces to understand genetic structure of both wild and farmed CGS and to inform future reintroduction programme; One CGS conservation genetics EDGE Fellow recruited and trained at KIZ. Indicators are adequate and appropriate to measure the progress towards the Output.

	information • Integration of CGS genetic data into longer-term range-wide conservation management • 1 CGS conservation genetics EDGE Fellow trained.	
Activity 2.1. Collect genetics samples from wild and captive CGS and CGS specimen		Genetic samples of wild-caught & captive CGS in farms were collected from Qinghai, Shaanxi, Sichuan, Hunan, Henan, Guangxi and Guizhou Province, greatly enhancing the genetic database at KIZ. To collect more samples in 100 identified field sites by different field teams.
Activity 2.2. Develop microsatellites and associated protocols for analysis of CGS genetics		36 microsatellite markers further tested and screened and 15 effective markers developed by KIZ and genotyped for 166 samples. Conservation genetic lab protocols refined & improved. To develop more and select high-quality microsatellites
Activity 2.3. Develop protocol for genetic screening of any captive CGS released to supplement wild populations;		Protocols developed by KIZ to scientifically collect samples from captive CGS to understand CGS genetic structure of farms, facilitating future screening of farm individuals for conservation breeding/ reintroduction programme. To conduct genetic screening an analysis of samples collected from farms.
Activity 2.4. Analyse genetic samples collected at KIZ		Lab work conducted on mitochondrial Cytb and D-loop sequencing of genetic samples at KIZ; Genetic diversity, differentiation, gene flow among populations and phylogenetic patterns analysed; 7 distinct groupings of CGS identified. To analyse new collected samples and improve CGS genetics database at KIZ
Activity 2.5. Manage and improve CGS genetics database at KIZ;		Genetic database at KIZ enhanced and improved with more samples collected and analysis conducted. To continue the genetic lab work & analysis to improve the genetic database.
Activity 2.6. Train and supervise EDGE Fellow focusing on CGS conservation genetics at KIZ		EDGE Fellow trained at KIZ in skills of genetics and phylogeography study on CGS. To identify and address gaps and provide ongoing training and supports by ZSL and PSG.
Output 3. Disease threats to farmed and wild CGS identified and mitigation strategies developed.	Develop CGS disease diagnostic & research capacity within China • Identify major disease threats to wild and farmed CGS & investigate routes of transfer between the two • Raise awareness of disease / biosecurity / quarantine issues among farms & captive breeding centres, including treatment of waste water from farms • Develop protocols to determine health and infection status of animals destined for release • Develop disease mitigation measures & treatments for captive/farmed CGS • CGS farming becomes self-sustainable and no longer relies on regular inputs of wild-caught animals •	Connections and trust built with Shaanxi and Guizhou Fisheries Management Bureaux and farms; farms in Shaanxi with disease outbreaks visited and samples taken for Ranavirus, Bd and Mycobacterium investigation; history of Bd investigated using museum achieved samples One CGS disease diagnostics & surveillance EDGE Fellow recruited and trained at SNNU. Indicators are adequate and appropriate to measure the progress towards the Output.

	1 CGS disease diagnostics & surveillance EDGE Fellow trained.	
Activity 3.1. Collect field samples from wild and captive CGS		Samples from wild-caught and farmed CGS collected from captive farms in Shaanxi and Guizhou province for diagnostic investigations; samples from farms at which the disease outbreak happened analysed on Ranavirus, Bd and Mycobacterium infection. To collect more samples to enhance the understanding of disease risk to wild and farmed CGS so that to develop disease mitigation and prevention measures.
Activity 3.2. Develop protocol for disease screening of any captive CGS released to supplement wild populations		Samples from wild-caught CGS in Guizhou (which may be used for <i>ex situ</i> conservation breeding and releasing in FNNR) analysed on Ranavirus, Bd and Mycobacterium infection; A farm questionnaire developed and successfully piloted to find out husbandry of farms, disease status and existing releasing activities to provide references for future biosecurity management and releasing programme planning. To conduct farm questionnaire surveys in 100 identified sites; conduct continued disease screening on samples collected from farms across China and report results to farms and Fisheries Bureaux for a better
Activity 3.4. Train and supervise EDGE Fellow focusing on CGS disease diagnostics and mitigation strategies at SNNU		EDGE Fellow trained at SNNU in skills of CGS disease diagnostics and mitigation strategies. To identify and address gaps and provide ongoing training and supports by ZSL and PSG.
Output 4. Build upon existing CGS farming protocols & infrastructure to develop <i>ex situ</i> protocols for conservation.	Develop protocols for CGS conservation breeding through cooperation with farms & a targeted CGS Conservation Breeding Workshop • Develop plan for first captive population of CGS for conservation breeding & create appropriate facility at the Shaanxi Wild Animal Rescue and Research Centre • Government-endorsed conservation breeding and release programme for CGS, removing any requirement for the release of commercially farmed CGS as a conservation measure.	A proposal on constructing the 1 st CGS conservation breeding and education facility in FNNR submitted to governmental bodies in Guizhou and circulated to stakeholders involved; Cooperation established with, and supports garnered from, key governmental bodies (i.e. Fishery Bureau, FNNR and Guizhou Environmental Bureau); locally wild-caught CGS on farms around FNNR were firstly microchipped and swabbed for genetic analysis and pathogen surveillance with key fishery officials trained with relevant skills, building capacity and evidence bases for future conservation breeding, re-introduction and monitoring. Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 4.1. Construct, populate and develop pilot CGS <i>ex situ</i> conservation breeding facility		Networks built with governmental bodies, academic institutions and farms in Guizhou to initiate a pilot conservation breeding and releasing programme in FNNR; locally wild-caught CGS on farms around FNNR microchipped and the swabs collected for genetic analysis and pathogen surveillance to screen potential animals for future conservation breeding/re-introduction programme; local fishery officials trained to develop skills for better management and monitoring of wild and re-introduced populations. To conduct the Key Stakeholder Conservation Breeding Facility Planning Workshop at FNNR (May 2014) and jointly raise funds to construct the 1 st pilot CGS conservation

		breeding facility at FNNR.
Output 5. Education & awareness-raising activities to promote the status & conservation needs of CGS across its range at local, national & international level.	CEPA training and planning workshop including a variety of stakeholders to set future directions to raise the profile of CGS & facilitate its conservation • Public campaigns conducted in 2 key project target areas (Shaanxi and Guizhou) highlighting importance & conservation requirements of CGS • 20,000 appropriate CEPA materials produced & distributed at local community meetings & schools in target areas • Train EDGE Fellows and supervisors in CEPA and project coordination • 9 local, 6 national & 2 international newspaper articles; 9 local, 6 national & 2 international radio & TV interviews; Project blog and social networking sites established • 6 internet articles on partner websites.	CEPA campaigns conducted towards schools and the public in Yunnan and Guizhou Province with appropriate CEPA materials produced and distributed in project areas; volunteers recruited in Guizhou and Yunnan Province to conduct cascade CEPA campaigns; overall awareness-raising through media and online social marketing started . Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 5.1. Conduct CGS and freshwater ecosystem CEPA training and planning workshop		Volunteers recruited and trained in Guizhou and Yunnan Province to conduct cascade CEPA campaigns. To facilitate volunteers to plan and conduct CEPA campaigns in project areas.
Activity 5.2. Develop and circulate long-term CGS and freshwater ecosystem CEPA strategy		904 public questionnaires collated and analysed to build the first baseline data on public awareness towards CGS, and corresponding CEPA strategy developed based on the findings.
Activity 5.3. Produce appropriate project CEPA materials;		CEPA booklet, cartoons posters, artworks produced and disseminated in project areas. To diversify CEPA materials/programmes targeting different audiences.
Activity 5.4. Conduct public CEPA campaigns		CEPA campaigns conducted in Yunnan and Guizhou Province towards schools and the public; Conduct CEPA campaigns in other project areas especially towards rural communities outside protected areas.
Activity 5.5. Plan and conduct overall awareness strategy (media/social marketing).		Online social marketing conducted to raise awareness of CGS conservation nationally and internationally; collaboration strengthened with the Yunnan Science & Technology Centre to conduct CEPA campaigns towards the wider public.

		To carry out awareness-raising continually through media and existing networks with governments, science and technology associations and project partners.
Output 6. Development of a global network that seeks to conserve giant salamanders nationally & internationally.	Link up international network of protected areas & CGS/cyptobranhchid experts • Project staff to take part in CIG, JGSS & CHS meetings • Engage with the highest levels of government & advocacy to garner support for the conservation of the CGS as an iconic species and a key component of the maintenance of healthy, functioning watersheds • Meetings with MoEP, MoA, FMBs & other relevant ministries to discuss CGS policy imperatives.	Regional, national and international conferences, seminars & workshop attended to disseminate this project and initial findings; Meetings with relevant governments by project partners in Guizhou, Shaanxi, Sichuan, Hunnan, Yunnan, Henan, Anhui, Chongqing, Hubei, Jiangxi and Zhejiang provinces to garner support for CGS conservation. Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 6.1. Meetings with relevant government ministries and stakeholders;		Meetings with relevant governments in CGS range provinces on the purpose of establishing network, facilitating in-country CGS survey & monitoring, building conservation capacity and developing potential post-project funding. To meet with other relevant ministries to discuss CGS policy imperatives
Activity 6.2. Build and maintain project website		Bilingual (English and Chinese) project website built. To maintain and manage project website.
Activity 6.3. Different project partners attend relevant national and international conferences to disseminate project purpose, findings and achievements (including CHS, EcoHealth, Society for Conservation Biology; JGSS; CIG)		Scientific presentations given at the Chinese Herpetological Annual Conference and to multiple national and international institutes, with collaboration networks built to academic institutes and NGOs. To attend national and international conservation conferences to disseminate project results.

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.</p>			
<p>Sub-Goal: Improving scientific understanding & in-country capacity to strengthen the conservation framework for CGS.</p>	<p>Progress on developing & implementing a national conservation strategy in China, supported by the MoEP, MoA, FMB & the farming industry, to safeguard wild CGS in key locations across the range in the drainage basins of the Yellow, Yangtze & Pearl Rivers.</p>	<p>MoEP reports to CBD and reports to CITES • China National Biodiversity Strategy monitoring reports.</p>	
<p>Purpose Building the evidence-base & capacity to underpin, promote & conduct a strategic conservation plan for the CGS.</p>	<p>First robust dataset of population distribution, relative abundance and threat distribution across key range areas & genetic connectivity • Improved in-country resources & capacity for addressing both in situ & ex situ conservation concerns, including: monitoring protocols; population genetics database & biobanked material; disease diagnostic protocols; conservation breeding protocols; CEPA strategy and 2 campaigns; & the establishment of an effective national & international network to support & promote the sub-goal.</p>	<p>Conservation Action Plan (National/Provincial) • Evaluated training schemes in monitoring, disease diagnostics, population genetics analysis, database construction, & conservation breeding • Scientific literature in Chinese/English • MoEP reports to CBD • China National Biodiversity Strategy monitoring reports • Project progress reports.</p>	<p>Effective collaboration & communication between all project partners • Chinese government authorities continue to support project.</p>
<p>Outputs 1. Evidence-base on CGS distribution, population status, ecology & conservation requirements strengthened & disseminated.</p>	<p>Scientifically robust baseline data for CGS occurrence/abundance in range-wide study regions collated, analysed & reported • Predictive Habitat Model developed, that factors-in Climate Change, to delimit a suitable remaining range area for CGS to inform future conservation breeding release efforts & establish potential locations of remnant populations • Questionnaire-based survey protocols developed & utilised to collect local informant data on current / historical range • Standardised field survey programme developed & utilised • 1 CGS survey & monitoring EDGE Fellow trained.</p>	<p>Full review of existing data produced • Revised range map produced • Standardised long-term monitoring protocols formalised & distributed • Interview protocols document • reports and published papers showing results of field work • Centralised information portal developed for dissemination of project progress & findings • Post-project skills audit & expert assessment.</p>	<p>Chinese government (specifically the Province-level FMB representatives) continue to provide permits for field research</p>

<p>2. Range-wide population genetics & phylogeography of CGS resolved to safeguard maximum genetic diversity of this species.</p>	<p>CGS Genetics Group established to coordinate collection, analysis, storage, databasing & dissemination of genetic information to facilitate conservation management and sustainable production of wild CGS • Field collection of CGS genetic samples across known range • Microsatellites developed & databased to enable the analysis of genetic samples • Genetic analysis of samples, investigating phylogeography, & identifying distinct evolutionary units & possible evidence for cryptic species • Biobanking of genetic information • Integration of CGS genetic data into longer-term range-wide conservation management • 1 CGS conservation genetics EDGE Fellow trained.</p>	<p>CGS genetic group established & coordination/remit agreed • CGS genetics database expands • Protocols for developing microsatellites produced • Scientific literature in Chinese/English • Moratorium on current government-endorsed release programme & protocol for genetic screening of any animals released to supplement wild population • Biobank established • Post-project skills audit & expert assessment.</p>	<p>Sufficient samples can be collected from wild animals, allowing for possible presence of released salamanders from a different sub-population • MoEP, MoA and FMB accept project recommendations.</p>
<p>3. Disease threats to farmed and wild CGS identified and mitigation strategies developed.</p>	<p>Develop CGS disease diagnostic & research capacity within China • Identify major disease threats to wild and farmed CGS & investigate routes of transfer between the two • Raise awareness of disease / biosecurity / quarantine issues among farms & captive breeding centres, including treatment of waste water from farms • Develop protocols to determine health and infection status of animals destined for release • Develop disease mitigation measures & treatments for captive/farmed CGS • CGS farming becomes self-sustainable and no longer relies on regular inputs of wild-caught animals • 1 CGS disease diagnostics & surveillance EDGE Fellow trained.</p>	<p>First CGS disease diagnostic laboratory & training centre established, training post-doctoral students • CGS disease diagnostic protocols developed and important disease threats identified • Protocols for disease screening of CGS developed and implemented prior to release • CGS disease information and mitigation document developed & circulated to government & CGS stakeholders (including CGS farmers) • Anonymous surveys of farms indicate that wild-caught CGS are no longer required by the farming industry • Post-project skills audit & expert assessment.</p>	<p>Access to sample farmed and wild CGS granted • Farmers willing to adopt disease mitigation protocols • MoEP, MoA and FMB accept project recommendations.</p>
<p>4. Build upon existing CGS farming protocols & infrastructure to develop <i>ex situ</i> protocols for conservation.</p>	<p>Develop protocols for CGS conservation breeding through cooperation with farms & a targeted CGS Conservation Breeding Workshop • Develop plan for first captive population of CGS for conservation breeding & create appropriate facility at the Shaanxi Wild Animal Rescue and Research Centre • Government-endorsed conservation breeding and release programme for CGS, removing any requirement for the release of commercially farmed CGS as a conservation measure.</p>	<p>Conservation breeding workshop report • Conservation breeding protocols developed • Conservation breeding training manual developed • First CGS conservation breeding facility and population established • Strategy document developed for establishment of further conservation breeding populations based on CGS Genetics Group recommendations • Disease-free & genetically managed CGS available for release into the wild.</p>	<p>Government permission granted to establish conservation breeding population(s) of CGS.</p>
<p>5. Education & awareness-raising activities to promote the status & conservation</p>	<p>CEPA training and planning workshop including a variety of stakeholders to set future directions to raise the profile of CGS & facilitate its conservation • Public campaigns conducted in 2 key project target areas (Shaanxi and Guizhou) highlighting importance & conservation requirements of CGS • 20,000 appropriate CEPA materials produced & distributed at local</p>	<p>Project annual reports • Pictures, footage & report from CEPA workshop • Project coordinator CEPA training report • Footage & reports of 2 CEPA campaigns (including school presentations, fairs, art displays, theatre, public CGS educational encounters) • Radio & TV transcripts/recordings, newspaper & internet</p>	<p>Target areas are receptive to CEPA campaign activities • Campaigns are appropriately pitched</p>

<p>needs of CGS across its range at local, national & international level.</p>	<p>community meetings & schools in target areas • Train EDGE Fellows and supervisors in CEPA and project coordination • 9 local, 6 national & 2 international newspaper articles; 9 local, 6 national & 2 international radio & TV interviews; Project blog and social networking sites established • 6 internet articles on partner websites.</p>	<p>articles, scientific papers • Project partner websites & hit-count • Short film cut from project footage at end of Year 3.</p>	<p>to influence attitudes / behaviour of target audience • Media willing to publicise information about CGS threats & conservation.</p>
<p>6. Development of a global network that seeks to conserve giant salamanders nationally & internationally.</p>	<p>Link up international network of protected areas & CGS/cyptobranchid experts • Project staff to take part in CIG, JGSS & CHS meetings • Engage with the highest levels of government & advocacy to garner support for the conservation of the CGS as an iconic species and a key component of the maintenance of healthy, functioning watersheds • Meetings with MoEP, MoA, FMBs & other relevant ministries to discuss CGS policy imperatives.</p>	<p>Project website for dissemination of CGS information, project progress & findings, releasing a biannual online newsletter • Reports & presentations to CIG, JGSS & CHS • Reports of meetings with government bodies.</p>	<p>Ongoing support from international colleagues and Chinese government.</p>

Activities (details in workplan)

0. Project management, monitoring and reporting activities

0.1 Recruitment of Project Coordinator; **0.2** Project Steering Group established / delivering ongoing guidance; **0.3** Recruitment of EDGE Fellows; **0.4** Establishment of MOU(s) / agreements between project partners as appropriate; **0.5** Hold meetings with key government partners in Beijing (MoEP/FMB/MoA); **0.6** Project half year reports submitted to Darwin Initiative; **0.7** Project annual reports submitted to Darwin Initiative; **0.8** Project final report submitted to Darwin Initiative; **0.9** Annual group project review meetings in China; **0.10** Final project workshop on CGS and freshwater ecosystem conservation in China for all relevant stakeholders (both Chinese and international) in China; **0.11** Additional project fundraising and continued development of post-project sustainability strategy.

1. Evidence-base on CGS distribution, population status, ecology & conservation requirements strengthened and disseminated

1.1 Conduct training visits to Anhui/Qing'hai/Shaanxi/Guangxi Provinces with three EDGE Fellows; **1.2** Develop standardised questionnaire-based survey protocol; **1.3** Develop standardised field survey protocol; **1.4** Develop predictive habitat model; **1.5** Develop long-term monitoring protocol and strategy; **1.6** Conduct long-term monitoring at selected field site; **1.7** Train and supervise EDGE Fellow focusing on long-term monitoring of wild CGS in Guizhou/Guangxi at GU/SCIEA.

2. Range-wide population genetics & phylogeography of CGS resolved to safeguard maximum genetic diversity of this species

2.1 Collect field genetics samples from wild and captive CGS; **2.2** Develop microsatellites and associated protocols for analysis of CGS genetics; **2.3** Develop protocol for genetic screening of any captive CGS released to supplement wild populations; **2.4** Manage and improve CGS genetics database at KIZ; **2.5** Analyse genetic samples collected throughout project at KIZ; **2.6** Biobanking of genetic samples at KIZ; **2.7** Train and supervise EDGE Fellow focusing on CGS conservation genetics at KIZ.

3. Disease threats to farmed and wild CGS identified and mitigation strategies developed

3.1 Collect field samples from wild and captive CGS; **3.2** Complete the establishment of a disease diagnostic laboratory at SNU; **3.3** Develop disease diagnostics and screening protocols for wild and farmed CGS and analyse samples; **3.4** Develop protocol for disease screening of any captive CGS released to supplement wild populations; **3.5** Train and supervise EDGE Fellow focusing on CGS disease diagnostics and mitigation strategies at SNU.

4. Build upon existing CGS farming protocols & infrastructure to develop ex situ protocols for conservation

4.1 Construct, populate and develop pilot CGS *ex situ* conservation breeding facility at SWARRC; **4.2** Develop CGS conservation breeding protocols; **4.3** Initiate CGS conservation breeding at pilot facility; **4.4** Develop government-endorsed conservation breeding and release programme.

5. Education & awareness-raising activities to promote the status & conservation needs of CGS across its range at local, national & international level

5.1 Conduct CGS and freshwater ecosystem CEPA training and planning workshop; **5.2** Develop and circulate long-term CGS and freshwater ecosystem CEPA strategy; **5.3** Train 3 EDGE Fellows in CEPA campaign organisation and implementation; **5.4** Produce appropriate project CEPA materials; **5.5** Conduct public CEPA campaigns; **5.6** Plan and conduct overall awareness strategy (media/social marketing).

6. Development of a global network that seeks to conserve giant salamanders nationally & internationally

6.1 Meetings with relevant government ministries and stakeholders; **6.2** Build and maintain project website; **6.3** Different project partners attend relevant national and international conferences to disseminate project purpose, findings and achievements (including CHS, EcoHealth, Society for Conservation Biology; JGSS; CIG); **6.4** Final Darwin Initiative project strategy workshop on promotion of CGS and freshwater ecosystem conservation in China.

Annex 3 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

This may include outputs of the project, but need not necessarily include all project documentation. For example, the abstract of a conference would be adequate, as would be a summary of a thesis rather than the full document. If we feel that reviewing the full document would be useful, we will contact you again to ask for it to be submitted.

It is important, however, that you include enough evidence of project achievement to allow reassurance that the project is continuing to work towards its objectives. Evidence can be provided in many formats (photos, copies of presentations/press releases/press cuttings, publications, minutes of meetings, reports, questionnaires, reports etc) and you should ensure you include some of these materials to support the annual report text.

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	✓
Is your report more than 5MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	✓
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	✓
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	✓
Have you involved your partners in preparation of the report and named the main contributors	✓
Have you completed the Project Expenditure table fully?	✓
Do not include claim forms or other communications with this report.	