Darwin Initiative Main Project 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

Darwin Project Information

Project Reference	19-003
Project Title	A sustainable future for Chinese giant salamanders
Host Country/ies	China
Contract Holder Institution	Institute of Zoology, Zoological Society of London
Partner institutions	Kunming Institute of Zoology (KIZ) Shaanxi Normal University (SNNU) Guiyang University (GU)
Darwin Grant Value	£300,374
Funder (DFID/Defra)	Defra
Start/end dates of project	1 July 2012 – 30 June 2016
Reporting period (e.g., Apr 2015 – Mar 2016) and number (e.g., Annual Report 1, 2, 3)	April 2014 – March 2015 Annual Report 3
Project Leader name	Andrew Cunningham
Project website/blog/Twitter	www.chinesegiantsalamanders.org
Report author(s) and date	Andrew Cunningham, Shu Chen 30th April 2015

- **Project Rationale**

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*). This ancient species also plays an important role in maintaining freshwater ecosystems and food chain stability. As it is mostly found where there are undisturbed riverbanks and deep forest cover, the CGS is regarded as an “environmental indicator” of healthy freshwater ecosystems.

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 and also habitat destruction, but there has been a marked lack of research concerning the historic and current distribution, habitats, status of, and threats to, the this species. The recent development of a rapidly growing CGS farming industry might have exacerbated the regional extinction of wild populations, but until this project started little was known about the extent of CGS farming, its potential (positive or negative) impacts on CGS conservation or the possible impact of CGS protection on local livelihoods.

By way of this project, therefore, we aim to build the evidence base and capacity to underpin, promote & conduct a strategic conservation plan for the CGS. This has included building collaborations with multiple institutions, training local personnel in a range of techniques and conducting a national survey (on-going) encompassing 100 field sites across China (Figure.1). In addition to CGS conservation, this project will have a lasting impact on China’s ability to respond to the amphibian extinction crisis and on the national implementation of CBD objectives.

Figure.1. CGS project survey sites across China

- **Project Partnerships**

The project is conducted as a partnership between ZSL and a group of organisations in China, each with a specific and equally important role to play. These partnerships arose from a 2010 workshop on CGS conservation, which was convened by ZSL and hosted by SNNU. Although the initial approach was made by ZSL, this tapped into demand within China and the partnerships for the current project stemmed equally from the UK and China. As the project has developed, the following additional collaborations have been made with organisations across China: Chengdu Institute of Biology (CIB), Hunan Fisheries Science Research Institute (HFSRI), Yangtze River Fisheries Research Institute (YRFRI), Guangxi Teacher Education University (GTEU), Yunnan Science & Technology Centre (YSTC), Guangxi Natural History Museum (GNHM), Kunming Zoological Museum (KZM). MoUs have been signed between ZSL and each partner or collaborating institute, and a collaboration MoU has been signed amongst all four project partner organisations. Face-to-face project partner meetings are held at least once a year to ensure good communication and working relationships among project partners and to agree annual work plans. 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.

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. Specifically, ZSL manages the overall project; providing direction and expert guidance; overseeing project capacity building; facilitating and conducting national CGS field and questionnaire surveys; conducting and managing Communication, Education and Public Awareness (CEPA) activities; 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.

This project is led by Professor Andrew Cunningham, Institute of Zoology, ZSL, but day-to-day project activities, including developing and facilitating in-country collaborations, are coordinated by a Chinese Project Manager, Shu Chen. Shu Chen also continuously monitors and evaluates project progress and reports regularly to the Project Leader, who takes overall responsibility for the delivery of project outputs against the Measurable Indicators. In addition, the Project Partners have established a Project Steering Group (PSG). Regular communication of the PSG takes place electronically (email) and through physical meetings. Two such meetings of the PSG occurred in Project Year 3; in Guiyang 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. 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. Dr. Lau's report following his attendance at a PSG meeting in Xi'an, March 2015 is attached as an appendix.

In order to determine the current distribution and status of, and threats to, the CGS, field and questionnaire surveys have been conducted across the species' range. Field sites were selected using a stratified random selection process based on a niche habitat model (50 sites) and known historical presence (50 sites). This survey has been more ambitious (wider geographic spread, larger number of field sites and the inclusion of local ecological knowledge) than originally planned when the project was initially formulated, but has been made possible through the establishment of collaborations with CIB, GTEU, YRFRI and HFSRI (both YRFRI and HFSRI are affiliated with the Ministry of Agriculture and Fisheries Management Bureau). Also, the DI grant was used to leverage additional funding, which was raised from the National Natural Science Foundation of China (in Year 2) and from Ocean Park Conservation Foundation, Hong Kong (in Year 3).

To raise public awareness of CGS and freshwater ecosystem conservation, additional collaborations have been developed with YSTC, GNHM and KZM, all of which conduct environmental education and receive a huge number of visitors (members of the public) annually. Further to training by ZSL staff, all three of these organisations now conduct CGS conservation education (something they had not done previously) through their extensive outreach programmes.

In addition to the above established collaborations, an MoU with Fanjingshan National Nature Reserve (FNNR) – a key protected area for CGS conservation – is currently being processed. This will create a partnership between ZSL and FNNR to enable a range of wildlife conservation activities, including CGS field surveys and the development of a centre for CGS conservation breeding and public education.

Project relationships in China continue to be cultivated and developed among relevant government bodies (e.g. Provincial 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. In the Project Year 3, Andrew Cunningham and Shu Chen have successfully engaged at high levels with both the British and Chinese governments (i.e. British Embassy Beijing, British Consulate General Chongqing, Chinese Embassy UK, the Ministry of Agriculture of China and the State Forestry Administration of China). Particularly, a policy letter has been submitted to the Ministry of Agriculture of China, the administrative authority in charge of CGS in China, for political endorsement. Also, Shu Chen represented ZSL in a round-table discussion on CGS conservation and the illegal wildlife trade with Prince William in Shanghai, March 2015. Provincial-level contacts with key government bodies have been developed by ZSL and project partners. ZSL has established firm collaboration with, and

garnered political support from, Guangxi Fisheries Management Bureau, Guizhou Fisheries Management Bureau and Guizhou Environmental Bureau. Professor Minyao Wu (SNNU), Professor Hanbin Xiao (YRFRI), Dr. Zhiqiang Liang (HFSRI) and Professor Feng Xie (CIB) are appointed Scientific Advisors of the Ministry of Agriculture's Fisheries Management Bureau of Shaanxi, Hubei, Hunan and Sichuan Province, respectively. As such, they play an important role in establishing project contacts and links to the CGS farming industry, feeding project results directly into the development of a sustainable CGS farming industry in China. As a high-ranking Academician and Vice-President of the Chinese Academy of Sciences, Professor Ya-ping Zhang at KIZ is extremely well connected politically. Genuine involvement and buy-ins from all partners are helping to promote the success and long-term sustainability of this project.

- **Project Progress**
- **Progress in carrying out project activities**

Output 0: Project management, monitoring and reporting activities

- The 3rd and 4th annual workshop of the project partner institutions were held in Guiyang University, 8th – 9th May 2014 and Shaanxi Normal University, 30th-31st March 2015, respectively. The meetings provided an opportunity for all the project staff and partners from across China to review progress, provide feedback, guidance, monitoring and oversight of this wide-ranging project and jointly set the project direction and detailed work plans. In particular, a well-known and highly respected Chinese herpetologist – Dr. Michael Lau – Senior Head of Local Biodiversity and Regional Wetlands Programme at WWF-Hong Kong, attended the 4th project annual meeting and provided valuable reviews to this project as an independent assessor (Appendix 1).

- Strong networks and project relationships have been further cultivated and developed within China for the *in situ* conservation of the CGS in more range provinces, with Guangxi Teachers Education University (GTEU) (survey and monitoring in Guangxi and Guangdong Province) being added to the collaborative network for this project. An MoU between ZSL and GTEU has been signed. To help ensure the success of surveys in Guangxi Province, a CGS conservation seminar was held at ZSL (London, October 2014) with 10 government officials from Guangxi Fisheries Management Bureau during a visit to the UK. Also, we developed a new survey team at SNNU to conduct field and questionnaire surveys in the Northern China provinces of Shaanxi, Gansu and Shanxi.
- Meetings were held, and close liaison developed, with key governmental officials in CGS survey range provinces in China, on the purpose of capacity building for CGS *in situ* & *ex situ* conservation and on in-country fundraising to support conservation sustainability for this species. Particularly, contacts were cultivated with central governments (Ministry of Agriculture & State Forestry Administration in Beijing and the Chinese Embassy in London) to report the project needs & conservation outputs. A policy letter highlighting the existing threats posed to wild CGS and farming was accepted by the Ministry of

Agriculture and further liaison will be made with these government bodies to facilitate and support CGS conservation programmes holistically across China. Also, the excellent collaboration developed with the British Embassy, Beijing and the British Consulate, Chongqing has continued and further strengthens the conservation recognition of this project in China and promotes Sino-UK collaboration on wider conservation issues (e.g. see Appendix 2).

- Additional training of the project's EDGE fellows on project planning and management, first aid and conservation tools was conducted by ZSL staff. Cascade training to in-country partners and collaborators will help add to the capacity building aspects of this project. We are very pleased to report that three of the project's EDGE fellows obtained secure employment in conservation jobs during Year 3, all of which include CGS conservation activities, thus ensuring post-project sustainability: Fang Yan (KIZ) successfully completed her PhD in Year 3 and has now been taken as a post-doctoral research fellow in conservation genetics by KIZ. In anticipation of the successful completion of his MSc degree in 2015, Jing-Cai Lv (GU) has obtained a position in Guizhou Academy of Sciences. This will be to develop herpetology research, including long-term *in situ* and *ex situ* conservation of CGS across key nature reserves in Guizhou Province. Shu Chen has gained a permanent, core-funded position at ZSL for the development of conservation programmes in China.
- During Year 3, the Darwin Initiative grant was used to leverage further monies for CGS conservation.

  1) ZSL received a grant of HK$203,833 (£16,038) entitled "Determining the status and distribution of the Critically Endangered Chinese Giant Salamander" from the Ocean Park Conservation Foundation, Hong Kong. This grant supports CGS field surveys in the Southern China provinces, 2014 to 2015.

  2) FNNR obtained a grant of CNY250,000 (£27,200) from Guizhou Environment Bureau "Biodiversity Conservation Specific Fund" to support monitoring and CEPA activities for Guizhou Snubnosed Monkey and CGS.

- Three scientific papers directly resulting from this project have been published and accepted by peer-reviewed journals, as below:

  1) Pan, Y., Wei, G., Cunningham, A. A.*, Li, S., Shu, C., Milner-Gulland, E. J. & Turvey, S. T. (2015) Using local ecological knowledge to assess the status of the Chinese giant salamander in Guizhou Province, China. *Oryx*. In press.

  2) Cunningham, A. A., Turvey, S. T., Zhou, F., Meredith, H., Guan, W., Liu, X., Sun, C., Wang, Z. & Wu, M. (2015) The development of the Chinese giant salamander (*Andrias davidianus*) farming industry in Shaanxi Province, China: conservation threats and opportunities. *Oryx*. In press.

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

The *Oryx* articles have been published ahead of print on-line and a press release issued at the time elicited the following article on the BBC website: http://www.bbc.com/earth/story/20150316-amazing-giant-chinese-salamanders

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

- With the expansion of the CGS survey from the regional scale to the national scale, a two-week refresher survey training course for established collaborators and initial training of new collaborators was conducted in FNNR in May 2014, following the protocols developed at the 2013 International CGS Conservation Field Training Workshop (ICGSCFTW). This has ensured that standardised protocols for the visual encounter surveys, trapping surveys, collection of environmental parameters, villager questionnaire surveys and the farm surveys are followed by each survey team across China. Most survey teams were accompanied most of the time by a UK expert (professional herpetologist volunteers who assisted with training the teams), thus helping to ensure that comparable results were collected across all survey sites. In the meantime, repeated annual surveys at selected river transects in FNNR has allowed collection of longitudinal data to inform CGS conservation management in this UNESCO World Biosphere Reserve.
- During Year 3, standardised surveys were conducted by five field teams in 63 counties in China across 7 Provinces and 1 Municipality (Fig.2): Mabian, Hongya, Emeishan, Pingshan, Xingwen, Heijiang, Baoxing, Ningnan, Nanping and Nanjiang counties in Sichuan Province; Macheng, Badong, Baokang and Danjiangkou counties in Hubei Province; Jiangkou, Kaili, Taijiag, Leishan, Jianghe, Tianzhu, Cengong, Majiang, Danzhai, Huangping, Shibing, Liping, Jinping and Sansui counties in Guizhou Province, Tonggu and Jing'an counties in Jiangxi Province; Chengkou, Pengshui and Wushan counties in Chongqing Municipality; Qimen, Xiuning, Yixian, Huoshan, Jingde and Jixi counties in Anhui Province; Zhangjiajie, Chaling, Guidong, Longshan, Sangzhi and Yongshun county in Hunan Province, and Anxian county in Henan Province. The sites surveyed are listed in the 100 study sites scientifically selected at the ICGSCFTW. In addition to conducting surveys for wild CGS at these sites, habitat was measured and environmental parameters collected to facilitate the establishment of long-term *in situ* conservation & monitoring sites. Also, CGS farms local to each survey site were visited to conduct farm questionnaire surveys & to collect CGS samples for genetic (buccal swabs) and pathogen (skin and cloacal swabs) analyses. During the 2014 surveys, only two wild CGS were found (one in FNNR, Guizhou and the other one in Guangwushan Protected Area, Sichuan). In both cases, the wild CGS were caught using the trapping survey method. Each wild CGS caught was measured for morphometric data, swabbed for genetic and pathogen analysis, microchipped and then released at the capture site.

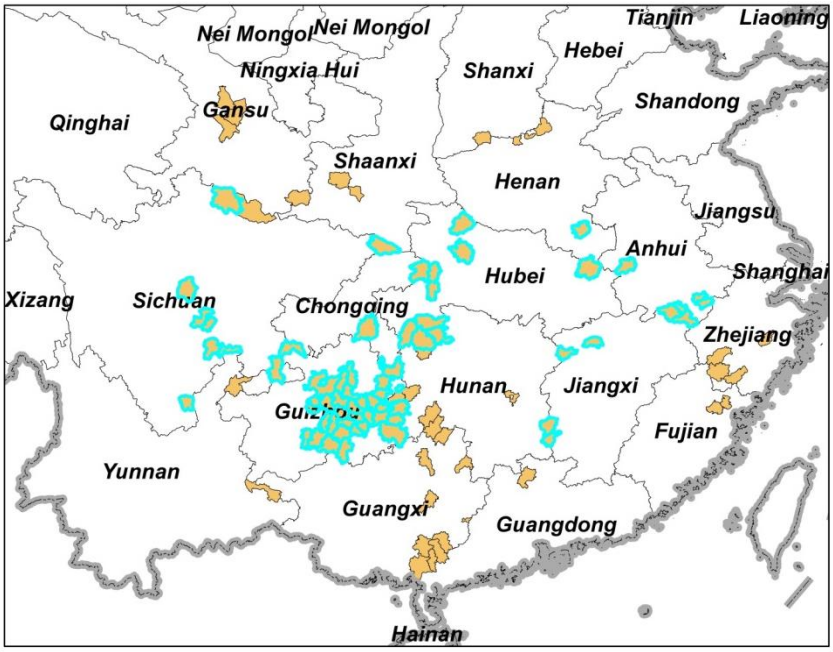
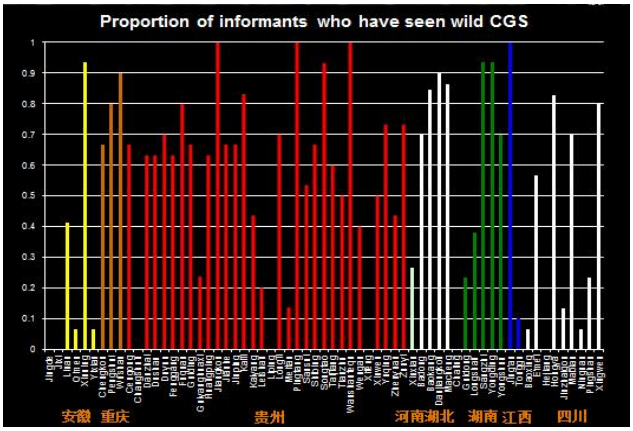


Figure.2. 100 survey sites. Yellow polygons with blue outlines – sites surveyed in 2014). Yellow polygons with no outlines – sites to be surveyed in 2015.

At each survey site, in addition to CGS field surveys, local villagers (aim for 30 per site) are interviewed using a standardized questionnaire. A total of 1916 villager interviews were completed in 2014; data was collated electronically and preliminary analyses were conducted. Both spatial and temporal differences in CGS sightings were found across provinces/sites (Fig.3).



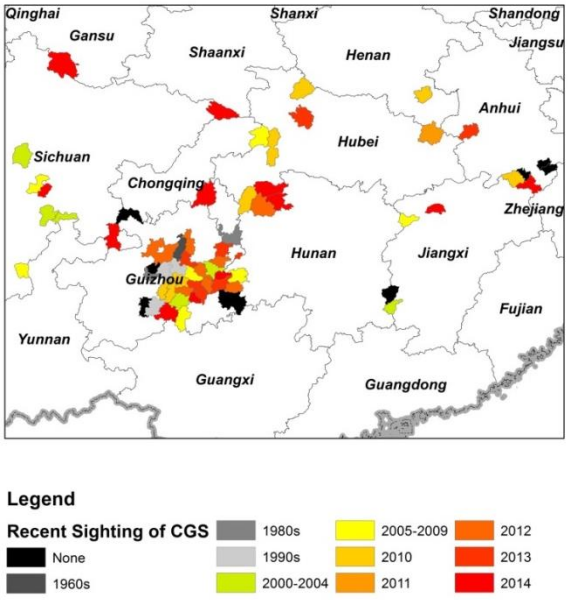


Figure.3. CGS sightings across study sites according to villager surveys conducted at 63 sites in 2014.

Further to the establishment of longitudinal survey transects and conducting villager surveys in and around FNNR, the park authorities invited further conservation collaboration with ZSL. This has led to an MoU currently being processed between FNNR and ZSL to facilitate joint conservation initiatives, including long-term *in situ* survey and monitoring of CGS in this UNESCO Biosphere Reserve. The FNNR recently obtained funds from the Guizhou Environment Bureau to support this work for at least 5 years.

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

- A total of 974 genetic samples of wild-caught & captive-bred CGS held in 51 farms were collected from Shaanxi, Sichuan, Hunan, Henan, Anhui, Hubei, Jiangxi, Henan and Guizhou Provinces and from Chongqing Municipality during the 2014 national survey, greatly enhancing the genetic database at KIZ. DNA has already been extracted from most of the collected samples and conservation genetic research (i.e. microsatellite and mitochondrial DNA analyses) are underway at KIZ. Genetic diversity, differentiation, phylogenetic patterns and gene-flow amongst farms will be analysed to identify genetic units, investigate anthropogenic impacts and develop evidence to inform future conservation management of the species. The samples collected under this project will form a CGS gene bank at KIZ.
- Protocols for population genetics analysis of CGS were optimised at KIZ, including: 1) improvement of the protocol to extract DNA from buccal swabs, and 2) the development of mitochondrial primers specific for *Andrias* (generic primers were found to amplify bacterial DNA which interfered with the results). So far, mitochondrial DNA (gene COI) has been amplified and sequenced successfully for 651 of 720 samples tested. Preliminary results have found 19 haplotypes, including one which has a broad distribution amongst farmed CGS. Eight major lineages were found, including four lineages already observed from KIZ's previous mitochondrial analyses and four newly discovered lineages. Again the results are preliminary, but genetic analyses to date appear to show extensive movement (trade) of CGS across provinces, including across water sheds, with Shaanxi as the major source of CGS exports to other provinces (Fig.4). (Commercial CGS farming originated in Shaanxi Province.)

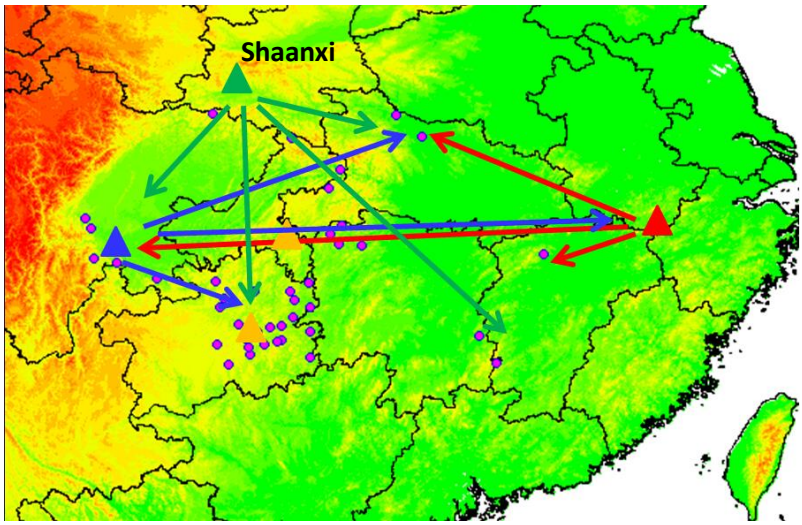


Figure.4. Apparent gene flow of farmed CGS (preliminary results). (Arrow thickness does not represent volume of gene flow.)

- Preliminary results from 58 individual CGS using 12 microsatellite loci suggest that there are three distinct groupings of CGS (i.e. Zheng'an County of Guizhou, Shaanxi, and the others).

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

- Professor Andrew Cunningham and Dr. Steven Price (IoZ) provided further training to EDGE Fellow Feng Zhou in laboratory techniques. This included establishing molecular diagnostics (qPCR) for the newly-discovered amphibian pathogen, *Batrachochytrium salamandrivorans* (the first in Asia) and additional training in the use of cell culture for ranavirus isolation. Five ranavirus strains (4 of CGS and 1 of bullfrog) have been subsequently isolated and cultured successfully in SNNU. This success will significantly progress understanding of the source of CGS ranavirus disease outbreaks and the threat this virus might pose to CGS in the wild.
- The project partners have made excellent progress and built trust amongst Fisheries Management Bureaux and major farming companies in CGS survey provinces. Farm surveys were conducted, along with the wild CGS surveys, to understand the history, husbandry and disease status of farmed CGS and the potential threats the farming industry might pose to wild populations. To ensure standardisation, the survey teams were trained in how to undertake swabbing on farmed CGS using the standardised protocol developed at the ICGSCFTW during the May 2014 field training at FNNR. In addition to taking samples, data were collected using standardised farm questionnaire surveys to help inform the development of recommendations for the sustainable management of this species in China.
- A total of 1470 skin and cloacal swabs from living animals were collected across 8 provinces and Chongqing Municipality for the investigation of selected amphibian pathogens (i.e. ranavirus, *Batrachochytrium dendrobatidis*, *B. salamandrivorans* and

Mycobacterium spp.). Pathogen selection is based on our knowledge of major infectious diseases of farmed CGS (ranavirus and *Mycobacterium* spp. – found during the course of the current project) and pathogens of international significance for amphibian conservation (ranavirus, *B. dendrobatidis* and *B. salamandrivorans*). So far, DNA has been extracted from 1076 samples; PCR analyses for ranavirus and Mycobacterium have been conducted on 538 of these samples. The results show that all samples tested to date were ranavirus negative, while 3 samples from Hubei and 2 samples from Chongqing were found to be *Mycobacterium* spp. positive.

- Further investigations on CGS mortality and disease outbreaks on farms have led to diagnostic analyses being conducted on 180 samples from 38 CGS that died on 15 farms from 9 counties of Shaanxi province. Ranavirus and *Mycobacterium* sp. infection continue to be identified as the major causes of death but tests for other pathogens are still ongoing.
- In addition to the above investigations, a large disease outbreak on a major farm in Hantai county, Shaanxi Province was investigated in October 2014. The farm was visited and samples were taken from 45 dead animals for disease screening and diagnostic investigations. Of these, 32 animals were found to be ranavirus positive but not all had classical ranaviral lesions. Further work is on-going to look for other pathogens or to investigate possible changes to host-virus interractions. Ranavirus is a significant cause of death of CGS in farms. It is also known to occur in farmed bullfrogs in China. To understand whether CGS ranavirus is a naural pathogen of the species or if it originated from elsewhere and it a consequence of commercial farming, we have been testing bullfrogs for the pathogen with a view to conducting molecular comparisons of the bullfrog and CGS viruses.

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

- FNNR, a UNESCO Biosphere Reserve located in Tongren City of Guizhou Province, is an historically important location for wild CGS, although overexploitation has led to a markedly depleted population. There is a growing interest in CGS conservation locally, however, and a real possibility to reduce poaching through increased enforcement and local education. As such, and given its relatively remote location and protected status, it fulfils many criteria required for a suitable site for a restocking programme provided
- The first CGS conservation breeding planning key stakeholder meeting “Building China’s 1st Conservation Breeding and Education Centre for the Chinese Giant Salamander in Fanjingshan” was successfully held in FNNR, 13th -14th May, 2014. This meeting, unprecedentedly, brought together 40 representatives from different government bodies (Protected Areas, Guizhou Fisheries Bureau, Forestry Bureau, Science and Technology Association), academic institutes and local farms to discuss the future for both wild CGS population recovery in FNNR and the sustainable farming of the species in Guizhou Province (Fig.5).
- Partnerships were developed among key stakeholders at the meeting, and all

stakeholders have shown a strong willingness and motivation 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. Potential sites for the facility were visited by key experts and an MoU is now being processed between ZSL and the FNNR Administration regarding 1) the building of the CGS conservation breeding and education facility in FNNR, 2) conducting longitudinal surveys & monitoring of wild CGS in FNNR, 3) developing a CGS reintroduction programme in FNNR and 4) developing additional species (e.g. other amphibians, reptiles and small mammal species) conservation efforts within and around FNNR.

The Guizhou Provincial Fisheries Management Bureau and the Beijing Municipal Bureau of Agriculture posted an official blog about this meeting, at http://www.gagri.gov.cn/Html/2014_05_19/2_47104_2014_05_19_107068.html and http://www.bjny.gov.cn/nyj/231595/618526/619059/5463822/index.html, respectively.

Figure.5. First collaboration of representatives from multiple stakeholders for CGS conservation in Fanjingshan National Nature Reserve

- A grant proposal entitled “Building the 1st conservation breeding and education centre in Fanjingshan National Nature Reserve” (CNY 8,000,000/ £869,565) was submitted to FNNR and Guizhou Environmental Bureau, where it is currently under consideration.
- A regional CEPA campaign was launched in Tongren City aimed at mitigating threats to underpin a successful future *ex situ* conservation programme in FNNR (refer to Output 5).

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

- More CEPA materials were designed and produced, with the inputs from Chinese volunteers, aiming to increase CGS knowledge, promote positive conservation attitudes and stimulate a sense of responsibility and pride to incentivise CGS conservation.

1) Project staff designed and published a CGS cartoon educational booklet for children (and their parents). This uses art & design in the context of CGS local culture to improve public accessibility to scientific knowledge. It describes CGS biology, ecology and threats, and includes a series of comics featuring four stylised CGS cartoon characters. It has been used in public CEPA campaigns. An educational video based on this booklet was also produced, see: http://www.youtube.com/watch?v=dgYqem9xhQU.

2) Project staff co-wrote and launched Guizhou Province's first ever wildlife conservation story book: "Xingda's Wildlife Explorations in Fanjingshan" (funded by the British Consulate, Chongqing). The book includes a CGS conservation chapter. A minimum of 5,000 copies have been distributed to schools in Guizhou. The book's launch led to 10 media stories on Chinese TV and in newspapers, e.g. http://www.gz.chinanews.com/content/2015/03-27/50311.shtml. The book may be adopted as a study aid for rural students near FNNR. One copy was given to Prince William when he visited China in March 2015. British Consulate General, Chongqing published an article about this book at https://www.gov.uk/government/world-location-news/guizhou-teenagers-get-first-science-book-about-local-wildlife?from=groupmessage&isappinstalled=0

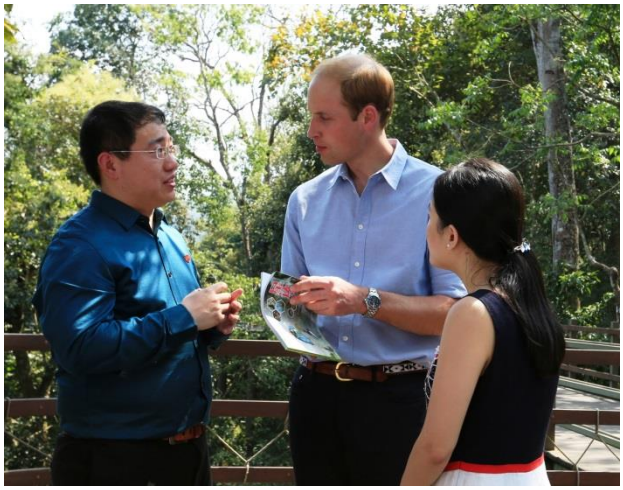


Figure.6. "Xingda's Wildlife Explorations in Fanjingshan" (left) was presented to Prince William (right).

3) A cartoon series on CGS conservation entitled "The Adventures of Big-headed Wawa" (co-designed, funded and published by the Chinese newspaper, Primary Schoolchildren Learning) was published and will reach a minimum of 800,000

schoolchildren (& their parents) across China.

4) A magazine article on CGS conservation (co-designed, funded and published by National Geographic Kids) was published and will reach a minimum 10,000 schoolchildren (& their parents) across China.

- To genuinely involve local people and to raise awareness of *in situ* CGS conservation near FNNR where wild CGS are still extant (one wild animal was captured there during our 2014 survey), a series of CEPA campaigns called "Go for CGS/Go for You" were conducted in FNNR with substantial involvement and support from different stakeholders. In addition to tourists, students and local villagers, the City Mayor of Tongren and an IUCN specialist group also visited this campaign. A documentary film "Go for Salamander" was produced by a Chinese volunteer Mr. Shu-Rui Zhang, which is available at http://www.youtube.com/watch?v=P1AeE3yDE-E. School campaigns were also conducted in Taohuayuan and Kaiwen primary schools that are near the rivers where the wild CGS was captured in FNNR. Results from pre-and post-questionnaire surveys of 48 students showed increased knowledge and positive perception changes to CGS by 41.6% and 12.5%, respectively, after the campaign.
- To increase the CEPA influence spatially and temporally in Guizhou, local university volunteers were recruited and trained from Tongren University to conduct cascade CEPA campaigns in/around FNNR. These students subsequently established their own association "Wild Fauna & Flora Conservation Society" in October 2014. This student conservation society has already organised two school campaigns on CGS conservation in Tongren City.
- To enable our CEPA campaigns to reach a wider audience in CGS range provinces, partnerships were further developed with Yunnan Science and Technology Centre (YSTC), Guizhou Science and Technology Centre (GSTC), Guangxi Natural History Museum (GNHM) and Kunming Zoology Museum (KZM) to develop self-sustaining CEPA campaigns. CEPA materials were shared with these organisations and they were facilitated to lead public outreach & school campaigns to publicise CGS conservation needs in Yunnan, Guizhou and Guangxi Provinces. These campaigns included CGS talks, documentary film screening, public-interactive activities and project poster displays.
- A Facebook project page (A sustainable future for Chinese giant salamanders) was set up to communicate project results and activities and to improve public outreach internationally. Within China (where Facebook is not available), a Weibo social media site (Chinese giant salamander Nini) was established for similar aims within China. In addition to the project website, ZSL has created a webpage to publicise the project, available at http://www.zsl.org/conservation/regions/asia/chinese-giant-salamander-conservation. There is also an EDGE webpage highlighting the evolutionarily distinctiveness and conservation needs of the CGS – the 2nd highest ranked EDGE amphibian, available at http://www.edgeofexistence.org/amphibians/species_info.php?id=547&search=focal.

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 3 in order to garner political and administrative support for CGS conservation, and to facilitate project work and fundraising in-country. Support has been obtained from central government and from provincial government bodies in Guizhou, Shaanxi, Sichuan, Chongqing, Henan, Anhui, Yunnan, Hunan, Hubei, Zhejiang and Guangxi Provinces. Additionally, this project was presented to Prince William by the Project Manager, Shu Chen, at a high-level round-table discussion on the illegal wildlife trade, which included another 9 key international NGOs in China (Fig.7).

Over the past year, media contacts within China have been further developed, including initiating discussions with national Chinese TV about making a documentary on CGS conservation. Also, Shu Chen was invited to write an article on CGS conservation for UNESCO's "Human and Biosphere". This will be published in 2015.

Figure7. High-level round-table discussion with Prince William, Shanghai, March 2015. (Shu Chen is second from left.)

- A presentation entitled "Use of art & design in conserving the Chinese giant salamander" was given to the Yunnan Arts University, April 2014, to motivate, inspire and engage more volunteers in CGS CEPA campaigns by producing CGS art & designs. Zeng Yue, an Art & 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".
- Scientific presentations entitled "A sustainable future for Chinese giant salamanders" were invited to be given at the 2nd Seminar on Captive Breeding Management of Wildlife (17th Jan 2015, Beijing), to the Beijing Forestry University (19th Jan 2015, Beijing) and to the Guangxi Fisheries and Management Bureau (20th October 2014, London) to highlight the differences in conservation breeding and farming and the need to enhance wild CGS protection in China.

- This CGS Darwin project was highlighted internationally through presentations and documentary film playing at international meetings, including the 3rd Asia Regional Conference of the Society for Conservation Biology (19th- 22nd August, 2014, Melaka, Malaysia) and the IUCN World Park Congress (12th -19th Nov, 2014, Sydney) with an e-poster available on the IUCN website http://wpc2014.digitalposter.com.au/.
- London Zoo (part of ZSL) obtained a CGS for exhibit (the only live CGS in the UK). The exhibit, which opened in December 2014, was designed around the current DI project and incorporates project CEPA materials (Fig.8). Over 1 million people from around the world visit London Zoo each year and the CGS exhibit functions as a channel to raise international awareness of the species and DI-funded conservation activities within China. It has quickly become one of the most popular exhibits at London Zoo and it trended on Twitter shortly after opening. A BBC news article is available at http://www.bbc.co.uk/newsround/30499294

Figure.8. CGS exhibit in London Zoo

Most of the project activities and outputs were conducted in the manner and time planned. The 2014 field surveys were hampered by unusually heavy and prolonged rain which led to dangerously high river levels and poor visibility. The surveying of one site in 2015 had to be abandoned due to an earthquake and its aftermath. Therefore, a no-cost one-year extension was requested from, and granted by, the DI secretariat. Plans and survey teams are in place for the remaining field sites to be surveyed in 2015.

• Progress towards project outputs

In Year 3 (April 2014 to March 2015), the project achieved excellent progress. Both national and international networks were strengthened, with the addition to the national network of more governmental bodies including central government, academic institutions, protected

areas and NGOs. The national academic network was strengthened with new collaborations established with GTEU and with FNNR. Five teams were developed and trained in standardised CGS survey protocols and the largest-scale *in situ* survey of wild CGS in China's history was launched. A total of 63 sites in 7 provinces and 1 municipality were surveyed in Project Year 3. Only two CGS were found in the wild, heightening the need to prioritise resources to strengthen both *in situ* and *ex situ* conservation of wild populations at key locations. Funding has been secured by FNNR to support at least 5-yr CGS survey and education campaigns in this UNESCO Biosphere Reserve. Two physical project partner annual meeting were held to review project outputs, refine protocols and make future directions, which has ensured the project results to be scientifically robust and the project aims to be met within the timeline.

A large number of swab samples were collected from wild-caught and captive-bred CGS on farms during the national surveys. Both mitochondrial DNA sequencing and microsatellite loci genotyping are underway at KIZ. The increase in sample numbers and sampled locations greatly enhances KIZ's genetic database and will enable a better understanding of CGS conservation genetics for the future conservation management of the species. Both ranavirus and *Mycobacterium* spp. were tested for at SNNU on samples collected from the national survey and from Shaanxi Province farms at which disease outbreaks occurred. Ranavirus continues to be a significant cause of death of farmed CGS and mycobacteriosis appears to be a growing problem. With assistance & training from ZSL, ranavirus was isolated and cultured successfully at SNNU to further our understanding of the threats posed by this pathogen.

The first CGS conservation breeding planning key stakeholder meeting was held. Multiple stakeholders were brought together for the first time and collaborations were established to move this forward. Importantly, both administrative and financial support has been obtained for CGS surveys and CEPA campaigns in and around FNNR for at least 5 years.

A variety of CEPA campaigns tailored to different interests has been carried out in China and sustainable CEPA campaigns have been established in Yunnan, Guizhou and Guangxi Provinces. The importance of CGS and freshwater ecosystems was also disseminated at the international level through, for example, project networking, meetings with high-level government agencies both in the UK and in China, the opening of a CGS exhibit in London Zoo, presentations at international conferences and on-line social marketing.

Most milestones under the Project Outputs were achieved in a timely fashion and most indicators remain adequate to measure project progress. It is anticipated that the outcomes of this project will be realised by its revised closing date and that post-project sustainability will be achieved. Output indicators are measured by the Project Leader and the Project Manager monthly to monitor the progress of each in-country partner. Project Partner and the Steering Group meetings are held at least twice a year to ensure all activities are carried out and research goals achieved within the time planned.

Although not a DI-funded project milestone, construction of the pilot CGS *ex situ* conservation breeding facility and initiating conservation releasing programmes have been delayed due to the relocation of the initial recipient, the Shaanxi Wild Animal Rescue and Research Centre (SWARRC) to a new site which is less suitable for such a facility. Results from the current national surveys and conservation genetic study have heightened the necessary needs to conduct wider and deeper surveys to carefully evaluate current status of, and threats to, wild CGS, identify key suitable conservation sites, and mitigate (& ultimately extirpate) threats before initiating any *ex situ* conservation programme. In Project Year 3, an alternative site (FNNR) for this facility was identified and an MoU is currently being processed by the Park Administration.

- **Progress towards the project Outcome**

In the Project Year 3, the largest standardised CGS survey in Chinese conservation history was launched. Surveys were conducted in 63 sites across 7 provinces and 1 municipality, with data collected on CGS current & historical distribution, status and threats across its historical range to build the first robust evidence base to inform and underpin future conservation management. Samples collected across the species' range have greatly enhanced the genetic databases and our understanding of CGS health. Also, both in-country conservation & research capacity and public (and political) awareness-raising were greatly strengthened. Collaborations and networks were further strengthened to inform a strategic conservation plan for the CGS. CEPA strategies were developed and CEPA networks were enhanced, with regional-scale public campaigns carried out in China. The international CGS conservation profile and the importance of freshwater ecosystems were highlighted at international conferences, London Zoo's new CGS exhibit and high-level engagement with the Chinese government, Chinese Embassy (London), the British Embassy (Beijing), the British Consulate (Chongqing) and the British Royal family.

The suggested indicators remain adequate for measuring the project outcomes. Apart from Outcome 4.1 (Construct, populate and develop pilot CGS *ex situ* conservation breeding facility at SWARRC), all project outcomes are likely to be achieved by the close of the project following the granting of a one-year no-cost extension, including Outcomes 4.2 & 4.3. As for Outcome 4.4, there already is a government-endorsed conservation release programme, but as it uses farmed salamanders of unknown provenance, unknown genetic make-up and unknown health status, and has no pre-release assessments of release sites or meaningful post-release monitoring, we are working with Chinese partners and collaborators to provide evidence from this project to government with the aim of improving this situation.

- **Monitoring of assumptions**

Both outcome and output assumptions still hold true that Project Partners in China keep effective communication & collaboration and that this project is supported by the Chinese government authorities at different levels and that the necessary permissions are granted. Due to the extremely low abundance of the species in the wild (we have found only two wild

CGS to date), so far insufficient samples have been collected from free-living wild animals for meaningful population genetics or pathogen evaluation of the species in the wild. However, contacts with farms and Fisheries Management Bureaux (the Province-level bodies which license farms) have allowed us to obtain samples from locally wild-caught animals in farms. Each farm survey is supported and facilitated by the local Fisheries Management Bureau and the visits to farms are usually accompanied by fisheries officials to increase the reliability that the farmers are telling the truth when identifying animals as locally wild caught. Results from the conservation genetic study will facilitate a more robust interpretation of these data.

- **Impact: achievement of positive impact on biodiversity and poverty alleviation**

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 by raising awareness (public and policy makers) of the need to conserve the CGS and its habitats, through identifying areas requiring additional protection and through building in-country research capacity for the conservation of amphibians and freshwater ecosystems. Also, engagement with the CGS farming industry and, in particular, our disease research is helping to reduce/prevent the loss of stock on farms due to infectious disease. This is helping to safeguard rural livelihoods (especially smallholder farmers who are vulnerable to economic loss) through better biosecurity and management for improved farming sustainability.

In Project Year 3, close connections and networks were further built and strengthened with Chinese government bodies. Results to date from the CGS national survey, including environmental parameter measurements, are being reported to both the central and provincial governments to facilitate improved freshwater management and to inform conservation strategies, such as protected area designation and conservation policy enactment. Also, project partners and young scientists from different provinces were trained in amphibian conservation techniques in their home provinces. This will ultimately have long-term benefits for freshwater biodiversity cross China. In particular, we have developed an excellent partnership with FNNR, leading to the establishment of multi-stakeholder involvement in CGS conservation. There is interest to replicate this across other nature reserves in China, which could be used to promote the development and implementation of a national freshwater conservation strategy with the CGS as the flagship species.

Due to the success of this project, future collaboration with FNNR will likely expand to include other amphibians, reptiles and small mammal species, thus delivering a wider impact on biodiversity. In addition, CEPA campaigns both locally and nationally have presented the CGS as an icon for watershed protection. The resulting increased awareness of CGS and freshwater ecosystem conservation will have long-term benefits for biodiversity and rural livelihoods.

Meanwhile, we have been also working closely with the Fisheries Management Bureaux and CGS farming communities to promote better biosecurity protocols, husbandry and management. Recent catastrophic ranavirus outbreaks on CGS farms have led to significant

economic loss to farm communities including multiple bankruptcies. Such disease threats to CGS farms also threaten wild CGS conservation. Our disease diagnosis and mitigation research is likely to play an important role in reducing economic risk to rural communities whilst also improving CGS conservation. Project partners and collaborators (i.e. Professor Wu (SNNU), Professor Xiao (YRFSRI) and Professor Xie (CIB)) have been engaged as scientific advisors for the provincial certification and assessment of CGS farms to foster sustainable farming and the biosecurity management in Shaanxi, Hubei, Zhejiang, Jiangxi and Sichuan Provinces. This provides a direct conduit for the practical implementation of project outputs.

- **Project support to the Conventions (CBD, CMS and/or CITES)**

Thirty percent of China's amphibians are threatened and 23% are Data Deficient according to the IUCN Red List. With global concern over freshwater ecosystems reaching crisis point, China must urgently address the protection of its freshwater resources. The CGS is an Appendix I CITES species and Class II State Major Protected Wildlife Species in China. This project highlights it as a symbol of healthy freshwater ecosystems in conjunction with the United Nations Decade of Education for Sustainable Development, and helps to build in-country capacity to address conservation concerns, including the emerging problems of climate change and infectious disease spread. Our project supports collaborative implementation of CBD (Articles 5-19)[1] by Chinese government agencies and partner institutions and the development of key Conservation Action Plan recommendations. This project works to implement the CBD in the context of both threatened species and inland water ecosystems.

In Project Year 3, capacity was further built among government and research institutions, including the training of young conservationists and volunteers. This should have a lasting impact on China's ability to respond to the amphibian extinction crisis and to implement CBD objectives nationally. Contacts and connections were made with the central Ministry of Agriculture, Ministry of Environmental Protection (China's CBD liaison) and with Provincial Fisheries and Management Bureaux (authorities in charge of freshwater species conservation & management) and Environment Bureaux. In particular, Guizhou Environment Bureau participated in two international CGS conservation workshops convened by ZSL and granted CNY250,000 (£27,200) to conduct CGS survey and CEPA activities for 5 years in FNNR. A proposal to construct a CGS conservation breeding and public education facility is currently under consideration by the Guizhou Environment Bureau. Project links have also been established with Beijing Forestry University which is partnered with the Endangered Species Import and Export Management Office of the People's Republic of China at the State Forestry Administration (China's CITES liaison). Formal visits to the State Forestry Administration will be made in the forthcoming project year.

[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.

- **Project support to poverty alleviation**

In recent years, Chinese local, provincial and national governments have invested in the development of the CGS farming industry as a means of economic development in poor, rural areas. Infectious disease is a significant threat to the sustainability of this industry, with mass mortalities occurring in Shaanxi Province since 2010; some farms have lost > 90% of their stock during a single disease outbreak. Our project has identified the primary causative agent in Shaanxi to be ranavirus. Others have shown the same agent to threaten CGS farms in other provinces. In addition, we have discovered another infectious disease, *Mycobacterium* spp., as a common cause of farmed CGS mortality. With diagnoses, comes the ability to advise on disease outbreak prevention through improved biosecurity and other measures. Identifying and mitigating these diseases directly benefits farm communities, particularly rural smallholders whose livelihoods are most vulnerable to loss of stock. Engaging farm communities is a major component of this project as disease reduction reduces disease threats to, and the re-stocking demand for, wild CGS.

- **Project support to Gender equity issues**

This project has built capacity of four EDGE Fellows, through a two-year fellowship training programme. These Fellows are destined to become future conservation leaders in China. Three of the Fellows are female. Such career development for female conservation leaders will have a gender equality impact as, in China, male scientists dominate. In Project Year 3, volunteer training in Guizhou Province targeted both boys and girls in the hope of increasing conservation knowledge, experience and independence equally across both genders. In Guizhou Province, as in many parts of China with low economic development, girls generally have less access than boys to formal education and life opportunities.

- **Monitoring and evaluation**

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.

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, staff working for ZSL's EDGE of Existence programme conduct regular meetings and skill audits with EDGE Fellows via email and Skype to ensure their skills gaps are identified and addressed. Tailored training programmes are designed and provided. Specific EDGE Fellow work plans, the detailed project work plan for each EDGE Fellow within the overall Darwin framework, are reviewed and supervised by the EDGE team in London to provide performance appraisals against milestones and indicators, to monitor skills/capacity development and to adjust project activities to fulfil the Darwin outputs. A final skills audit and evaluation will be conducted in September 2015 to evaluate training progress.

During Project Year 3, ZSL staff visited project sites and provided training of in-country staff and collaborators. In addition, two international herpetologists joined the national surveys for three months and ensured that the project activities were carried out to international standards and in a timely manner. 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. To be rigorous, an external assessor, Dr. Michael Lau, was appointd and his attendance at the Project Partner annual meeting in Xi'an, March 2015 provided valuable feedback.

- **Lessons learnt**

The project achieved overall success in networking, science, capacity building and awareness-raising. However, ignorance (including amongst Chinese project partners and Provincial government staff) led to the project being started without going through the central Chinese Ministry of Agriculture – the central government authority in charge of CGS conservation and farming. Contacts have now been made with this Ministry, and project review and its importance are submitted to, the Ministry and we are currently awaiting a letter of endorsement for our project. It will be necessary to engage with the central Chinese government in addition to Provincial governments (as we already had been doing) to maximize the success and impact of the project.

- **Actions taken in response to previous reviews (if applicable)**

Responses were submitted with the 2014/15 Darwin half year report.

- **Other comments on progress not covered elsewhere**

The 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 survey work conducted in 2014 was reviewed at the 2015 Annual Project Partner Meeting and a survey work plan was

agreed for 2015. Significant difficulties in 2014 were made by unseasonably wet weather with unusually heavy and prolonged rainfall in many study sites, preventing these sites from being surveyed. Also, an earthquake in Yunnan Province prevented access to a survey site. We are grateful to the Darwin Initiative for allowing a one-year no cost extension to enable the national surveys to be completed in 2015. Another difficulty in 2014 was the finding of only two CGS in the wild to sample for population genetics and pathogen investigations. It is unlikely that we will obtain samples from a sufficient number of wild CGS to provide meaningful results. We have, however, developed sampling protocols for farmed CGS and samples from (allegedly) wild-caught and captive-bred animals on farms have been obtained.

- **Sustainability and legacy**

Through this project, the networks built with multiple stakeholders, including high-level engagements with both UK and China governments will benefit the impact and sustainability of this project. In addition, this CGS conservation project has led to the development of other conservation opportunities in China, and projects on the illegal wildlife trade, elephant conservation and protected area management are now being developed.

Also, 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. EDGE Fellows (prospective conservation leaders) and key project partners were trained in conservation tools to lead biodiversity research and conservation programmes in China. Three EDGE Fellows have obtained employment in conservation beyond the life-time of this project.

Fang Yan has been taken on by KIZ as a post-doctoral research fellow in conservation genetics. Jing-Cai Lv has obtained a position in Guizhou Academy of Sciences to develop herpetology research, including long-term *in situ* and *ex situ* conservation of CGS across key nature reserves in Guizhou Province. Shu Chen has gained a permanent, core-funded position at ZSL for the development of conservation programmes in China.

Importantly, our project collaborators YRSRI and HFSRI are both institutes affiliated with Fisheries Management Bureaux and CGS conservation research is an institutional focus. The enhancement of their capacity in this area as a result of this DI project will further post-project sustainability and impact. Also, involvement of our project partners in improving biosecurity practice, genetic management and husbandry on farms will foster a more sustainable CGS farming industry, which could have a long-term impact on both biodiversity conservation and local livelihood security.

The success of this project has leveraged additional funding to support CGS conservation. In Year 3, in addition to support from Ocean Park Conservation Foundation Hong Kong, in-country funds have been raised by FNNR to support at least 5-years of CGS conservation research and public outreach. It is anticipated that more funds will be raised within China to support follow-up activities. Collaborations established with science centers, museums, universities and local volunteer groups are currently disseminating project outputs and this is

expected to continue beyond the life of the current DI-funded project. Independent CEPA campaigns for CGS conservation have already been conducted by some of these organisations.

- **Darwin Identity**

A bilingual project website, the ZSL website, a Facebook account and a Chinese weibo account have all been used as tools for disseminating information about this project and in all cases, the Darwin Initiative has been publicised. In Year 3, a CGS cartoon education video and a (second) documentary film for the CGS CEPA campaign were produced, both of which have a clear Darwin Initiative identity. This documentary and a film on CGS field surveys, which was produced in Year 2, have been shown at several public outreach events, meetings and international conferences. Both films are available on the project website.

During our CEPA campaigns and throughout our excellent collaborations with YSTC, GNHM, KZM, FNNR, protected areas and schools, information about the Darwin Initiative and its support for this project has been disseminated to the urban public, students and rural communities. Particularly, CEPA materials (i.e. booklets, posters and videos), which all include the distinct DI logo, have been distributed amongst these existing networks and volunteers; this dissemination within China is expected to continue over a sustained period post-project. In addition, the DI has been acknowledged in all of the scientific presentations and publications arising for the project. A bilingual project overview that highlights the distinct identity of Darwin Initiative has been disseminated to governments in China centrally, provincially and locally for political endorsement, and also to Chinese academic institutes and NGOs for project networking.

The use of social media, blogs and the project website has superseded the need for a project newsletter.

- **Project Expenditure**

- **Table 1 Project expenditure <u>during the reporting period</u> (1 April 2014 – 31 March 2015)**

Project spend (indicative since last annual report	**2014/15 Grant (£)**	**2014/15 Total Darwin Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs (see below)				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.
Consultancy costs				
Overhead Costs				
Travel and subsistence				Grant obtained by in-country Project Partners helped to cover part of the travel costs and allowed funding saved to support project operating in other project areas
Operating Costs				This includes £5,178 vired from salary costs and £3,169 from travel and subsistence to allowed extra CGS surveys to be undertaken in more provinces
Capital items (see below)				
Others (see below) Project website				Film Production
TOTAL	£84,592	£84,660		

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

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2014-2015

Project summary	Measurable Indicators	Progress and Achievements April 2015 - March 2015	Actions required/planned for next period
Impact: Improving scientific understanding & in-country capacity to strengthen the conservation framework for CGS.		In-country capacity built to conduct CGS and freshwater biodiversity research and conservation; connection built with the central Ministry of Agriculture & Provincial Fisheries Bureau and farms 8 provinces and 1 municipality to underpin and develop a sustainable farming industry; national survey launched to inform freshwater biodiversity protection; CEPA campaigns conducted to raise the profile of CGS and the importance of freshwater ecosystems; disease research carried out to mitigate threats and improve biosecurity on farms to safeguard local livelihoods and alleviate risk of poverty; and female EDGE fellows and local volunteers trained to enhance capacity of females to lead conservation in China.	[redacted]
Outcome Building the evidence-base & capacity to underpin, promote & conduct a strategic conservation plan for the CGS.	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.	Standardised CGS national field surveys conducted in 63 sites of 7 provinces and 1 municipality, with five field teams established and well trained; genetic database & the understanding of CGS diseases enhanced; In-country research capacity of field surveys, conservation genetics and disease strengthened; the first multi-stakeholder workshop "Building China's 1st CGS conservation breeding and education facility in FNNR" convened in FNNR, with partnerships established among different government bodies, farms and academic institutions and a MoU developed with FNNR on this; Conservation profile of CGS greatly improved through CEPA campaigns and	Standardised CGS national population surveys to be completed in Hunan, Henan, Yunnan, Shaanxi, Shanxi, Gansu, Guangxi, Guangdong and Zhejiang Province; Genetics database strengthened and disease threats identified to provide evidence bases for future conservation breeding and reintroduction; annual surveys in FNNR conducted with more transects identified to understand status of wild CGS to facilitate the planning of conservation breeding &

		at regional, national and international conferences & workshops; Networks with the governments enhanced including high-level authorities of China and UK and also with UK Royal family. Assumptions: Effective communication among project partners; continued supports from the Chinese government authorities.	reintroduction in FNNR; ongoing CEPA campaigns by museums, science centres and university volunteer associations in Yunnan, Guangxi and Guizhou Provinces; National &international network enhanced.
Output 1. Evidence-base on CGS distribution, population status, ecology & conservation requirements strengthened & disseminated.	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.	Standardised and integrated field survey, questionnaire and farm surveys successfully conducted in Hunan, Henan, Anhui, Sichuan, Chongqing, Hubei, Jiangxi and Guizhou to determine the current & historical distribution, threats and population status of wild CGS across CGS historical range in China; EDGE Fellows, five field surveys teams and volunteers trained at FNNR and project sites; Funding obtained from FNNR to support >5-yr *in situ* survey & monitoring in FNNR and career of EDGE Fellow Jing-Cai Lv developed at Guizhou Academy of Sciences to lead herpetological research in Guizhou province. Indicators are adequate and appropriate to measure the progress towards the Output.	
Activity 1.1. Conduct training visits to Guizhou, Hunan, Sichuan, Chongqing, Hubei and Jiangxi Provinces with EDGE Fellows and project partners		Two-week intensive training for CGS survey was held in FNNR, Guizhou (May 2014), with EDGE fellow, project partners, volunteers and protected area staff trained with survey protocols and skills by international herpetologists from UK. Training was further provided to teams at project sites by two UK herpetologists and the Project Coordinator from May to October 2014. To provide further training from June to August 2015 at project sites towards two new established field teams in Southern and Northern China to ensure standardisation across sites.	
Activity 1.2. Develop standardised questionnaire-based survey protocol		To conduct standardised questionnaire surveys in Hunan, Henan, Yunnan, Shaanxi, Shanxi, Gansu, Guangxi, Guangdong and Zhejiang Province.	
Activity 1.3. Develop standardised field survey protocol		To conduct standardised field surveys in Hunan, Henan, Yunnan, Shaanxi, Shanxi, Gansu, Guangxi, Guangdong and Zhejiang Province.	

Activity 1.4. Conduct long-term monitoring at selected field site		Two-week annual survey & monitoring conducted in FNNR at selected rivers with habitat information collated. To conduct continuous annual surveys in FNNR and identify new suitable transects & sites for long-term monitoring.
Activity 1.5. Train and supervise EDGE Fellow and project partners focusing on long-term monitoring of wild CGS in China		Capacity of EDGE Fellows and key project partners built in survey & long-term monitoring of wild CGS in their project areas. Particularly, EDGE Fellow Jing-Cai Lv has obtained a position in Guizhou Academy of Science to lead CGS survey & monitoring in Guizhou Province. 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 information • Integration of CGS genetic data into longer-term range-wide conservation management • 1 CGS conservation genetics EDGE Fellow trained.	Protocols for conservation genetics refined and lab work & analysis conducted on CGS genetic samples collected from 8 provinces and 1 municipality to understand genetic structure of both wild and farmed CGS and to inform future conservation management & reintroduction programme; EDGE Fellow Fang Yan trained & supervised by KIZ and EDGE team in London. Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 2.1. Collect genetics samples from wild and captive CGS and CGS specimen		Genetic samples (n=974) of wild-caught & captive CGS in 51 farms were collected from 8 provinces and 1 municipality, 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		Conservation genetic lab protocols refined & improved. Mitochondrial primers for COI gene developed specifically for *Andrias.*
Activity 2.3. Develop protocol for genetic screening of any captive CGS released to supplement wild populations;		Protocols developed & refined by KIZ to conduct mitochondrial DNA sequencing and microsatellite loci genotype lab work & analysis to understand CGS genetic structure on farms and identify unique genetic units, facilitating future screening of farm individuals for conservation breeding/ reintroduction programme. To conduct genetic screening and analysis of samples collected from farms.

Activity 2.4. Analyse genetic samples collected at KIZ		Lab work conducted on mitochondrial COI sequencing and microsatellite loci genotype of genetic samples at KIZ; Genetic diversity, differentiation, gene flow among populations and phylogenetic patterns analysed and impact of anthropogenic trade investigated; 19 haplotypes and 8 population clades of CGS identified from mitochondrial results and 3 distinct groupings of CGS identified through microsatellite results. To conduct lab work and analysis towards remaining and new collected samples.
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 Fang Yan trained at KIZ in skills of genetics and phylogeography study on CGS; EDGE fellowship supervised by EDGE team in London. 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 • 1 CGS disease diagnostics & surveillance EDGE Fellow trained.	A policy letter highlighting the needs of sustainable fariming submitted to the central Ministry of Agriculture for project endorsement; connections and trust built with provincial and local Fisheries Management Bureaux and farms in 8 provinces and 1 municipality and samples taken for Ranavirus, Bd, Bs and Mycobacterium investigation; farms in Shaanxi with disease outbreaks visited and samples collected; importance to adopt biosecurity measures highlighted to farms by project partners in relevant project areas; CGS disease diagnostics & surveillance lab work & analysis conducted; EDGE Fellow Feng Zhou further trained at SNNU by ZSL staff. Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 3.1. Collect field samples from wild and captive CGS		Samples from wild-caught and farmed CGS collected from captive farms (n=1470) in 8 provinces and 1 munipacility for diagnostic investigations; samples of dead CGS taken from farms in Shaanxi at which the disease outbreak happened in Year 3. 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 disease diagnostics and screening protocols for wild and farmed CGS and analyse samples		Samples analysed for Ranavirus, and Mycobacterium infection; ranavirus successfully cultured. To conduct disease screening for remaining and new collected samples.
Activity 3.3. Develop protocol for disease screening of any captive CGS released to supplement wild populations		Farm questionnaire surveys conducted with national field surveys to find out husbandry of farms, disease status and existing releasing activities to provide references for future biosecurity management and releasing programme planning. Samples analysed to inform disease status of CGS on farms across China and evaluate potential impact of current releasing programme. To conduct farm questionnaire surveys in remaining sites; conduct continued disease screening on samples collected form farms across China and report results to farms and Fisheries Bureaux for a better management.
Activity 3.4. Train and supervise EDGE Fellow focusing on CGS disease diagnostics and mitigation strategies at SNNU		EDGE Fellow Feng Zhou trained at SNNU in skills of CGS disease diagnostics, virus culture and mitigation strategies by ZSL staff for 1 month. 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 *ex situ* 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 key stakeholder meeting" Building the 1st CGS conservation breeding and education facility in FNNR" convened in FNNR, May 2014, which brought together different government, farms and academic institutions for the first time. Cooperation established, potential sites visited and a funding proposal submitted to governmental bodies in Guizhou and circulated to stakeholders involved; annual surveys conducted with local students and park rangers trained to build capacity and evidence bases for future conservation breeding, re-introduction and monitoring; CEPA campaigns conducted to raise awareness and mitigate threats in this park. Indicators are adequate and appropriate to measure the progress towards the Output.
Activity 4.1. Construct, populate and develop pilot CGS *ex situ* 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 CGS annual surveys in FNNR (May 2015) to collect more information on wild CGS status and their habitats; and jointly raise funds to construct the 1st 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 regionally and nationally with appropriate CEPA materials produced and distributed in project areas; a volunteer association developed and trained and cooperation further established with YSTC, GSTC, GNHM and KZM to conduct self-sustaining cascade CEPA campaigns in Guizhou, Guangxi and Yunnan Province to; 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		A student volunteer association "Wild Fauna and Flora Society" was established in Tongren Univerity, Guizhou, with 10 volunteers recruited and trained to conduct CEPA campaigns in Guizhou. YSTC, GNHM and KZM are also trained in CGS CEPA skills to carry out outreaches in Yunnan and Guangxi province. To facilitate volunteers and project partners to plan and conduct CEPA campaigns in project areas.
Activity 5.2. Produce appropriate project CEPA materials;		CEPA booklet, educational video, documentary films, posters, paper games and magazine articles produced and disseminated in project areas. Particularly, Guizhou's first ever wildlife story book "Xingda's explorations in Fanjingshan" published and launched, funded by British Consulate Chongqing, and distributed to rural schools in Guizhou to facilitate wildlife learning. To diversify CEPA materials/programmes targeting different audiences.
Activity 5.4. Conduct public CEPA campaigns		A series of CEPA campaigns "Go for Salamander" conducted in Guizhou; and more campaigns & long-term project display conducted in Yunnan and Guangxi Province lead by YSTC, KZM & GHNM. Facilitate & conduct CEPA campaigns in more project areas especially towards rural communities near 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. To carry out awareness-raising continually through media and existing

		networks with governments, science and technology associations, museums 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/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.	Networking with high-level governments in both China and UK including the royal family and Sino-UK conservation collaboration strengthened; Meetings with provincial governments by project partners in Guizhou, Shaanxi, Sichuan, Hunnan, Yunnan, Henan, Anhui, Chongqing, Hubei, Jiangxi and Zhejiang provinces to garner support for CGS conservation. Regional, national and international conferences, seminars & workshop attended to disseminate this project and initial findings; CGS exhibit set up in London for international networking and awareness-raising. 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 central ministries to discuss CGS policy imperatives
Activity 6.2. Build and maintain project website		Bilingual (English and Chinese) project website updated. 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 2nd Seminar on Captive Breeding Management of Wildlife, Society of Conservation Biology and IUCN World Park Congress 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.
Activity 6.4. A CGS exhibit set up in London Zoo, ZSL		A popular CGS exhibit set up in London Zoo since December 2014 to network & raise awareness internationally of this species and the on-the-ground activities in China.

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
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.			
Sub-Goal: Improving scientific understanding & in-country capacity to strengthen the conservation framework for CGS.	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.	MoEP reports to CBD and reports to CITES • China National Biodiversity Strategy monitoring reports.	
Purpose Building the evidence-base & capacity to underpin, promote & conduct a strategic conservation plan for the CGS.	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.	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.	Effective collaboration & communication between all project partners • Chinese government **authorities** continue to support project.
Outputs 1. Evidence-base on CGS distribution, population status, ecology & conservation requirements	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	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	Chinese government (specifically the Province-level FMB representatives) continue to provide permits for field research

strengthened & disseminated.	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.	progress & findings • Post-project skills audit & expert assessment.	
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 information • Integration of CGS genetic data into longer-term range-wide conservation management • 1 CGS conservation genetics EDGE Fellow trained.	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.	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.
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 • 1 CGS disease diagnostics & surveillance EDGE Fellow trained.	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.	Access to sample farmed and wild CGS granted • Farmers willing to adopt disease mitigation protocols • MoEP, MoA and FMB accept project recommendations.

4. Build upon existing CGS farming protocols & infrastructure to develop *ex situ* 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.	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.	Government permission granted to establish conservation breeding population(s) of CGS.
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.	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 articles, scientific papers • Project partner websites & hit-count • Short film cut from project footage at end of Year 3.	Target areas are receptive to CEPA campaign activities • Campaigns are appropriately pitched to influence attitudes / behaviour of target audience • Media willing to publicise information about CGS threats & conservation.
6. Development of a global network that seeks to conserve giant salamanders nationally & internationally.	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.	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.	Ongoing support from international colleagues and Chinese government.

Annex 3 Standard Measures

- **Table 1 Project Standard Output Measures**

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Y1 Total	Y2 Total	Y3 Total	Y4 Total	Total to date	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	Male and Female	Chinese	0	10	20		30	5
4B	Number of training weeks to be provided			0	21	32		50	20
4C	Number of postgraduate students to receive training	Male and Female	Chinese	8	5	5		13	5
4D	Number of training weeks to be provided			17	14	42		73	20
5	Number of people to receive at least one year of training (which does not fall into categories 1-4 above)	Female	Chinese	4	3	3		10	3
6A	Number of people to receive other forms of education/training (which does not fall into categories 1-5 above)	Male	Chinese	13	35	7		55	30
6B	Number of training weeks to be provided			13	39	28		80	46
7	Number of (ie different types - not volume - of material produced) training materials to be produced for use by host country			3	8	2		13	7
8	Number of weeks to be spent by UK project staff on project work in the host country	Male	British	11	18	44		73	50

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Y1 Total	Y2 Total	Y3 Total	Y4 Total	Total to date	Total planned during the project
9	Number of species/habitat management plans (or action plans) to be produced for Governments, public authorities, or other implementing agencies in the host country			0	0	0		0	2
10	Number of individual field guides/manuals to be produced to assist work related to species identification, classification and recording			0	1	0		1	1
11A	Number of papers to be published in peer reviewed journals			0	0	3		3	3
11B	Number of papers to be submitted to peer reviewed journals			0	3	0		3	2
12A	Number of computer based databases to be **established** and handed over to host country			0	2	4		6	2
12B	Number of computer based databases to be **enhanced** and handed over to host country			1	1	2		4	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	7		19	15
14B	Number of conferences/seminars/ workshops **attended** at which findings from Darwin project work will be presented/ disseminated.			4	5	6		9	8

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Y1 Total	Y2 Total	Y3 Total	Y4 Total	Total to date	Total planned during the project
15A	Number of national press releases in host country(ies)			0	1	5		4	6
15B	Number of local press releases in host country(ies)			0	0	15		15	9
15C	Number of national press releases in UK			0	2	5		7	2
15D	Number of local press releases in UK								
16A	Number of newsletters to be produced			0	0	0		4	6
16B	Estimated circulation of each newsletter in the host country(ies)			0	0	0		0	>25,000
16C	Estimated circulation of each newsletter in the UK			0	0	0		0	90,000
17A	Number of dissemination networks to be **established**			3	2	3		8	4
17B	Number of dissemination networks to be **enhanced/ extended**			0	1	2		3	1
18A	Number of national TV programmes/features in host country(ies)			0	0	0		0	3
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	2		2	4
18D	Number of local TV programmes/features in UK								
19A	Number of national radio interviews/features in host county(ies)			0	0	0		0	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		0	5
19D	Number of local radio interviews/features in UK								
20	Estimated value (£'s) of physical assets to be handed over to host			1,300	5,000.	8,840		15,140	42,494

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Y1 Total	Y2 Total	Y3 Total	Y4 Total	Total to date	Total planned during the project
	country(ies)								
21	Number of permanent educational/training/research facilities or organisations to be established and then continued after Darwin funding has ceased			0	3	2		5	3
22	Number of permanent field plots to be established during the project and continued after Darwin funding has ceased			0	1	0		1	3
23	Value of resources raised from other sources (ie in addition to Darwin funding) for project work								£325,434

- **Table 2 Publications**

Title	**Type** (e.g. journals, manual, CDs)	**Detail** (authors, year)	**Gender of Lead Author**	**Nationality of Lead Author**	**Publishers** (name, city)	**Available from** (e.g.website link or publisher)
The development of the Chinese giant salamander (*Andrias davidianus*) farming industry in Shaanxi Province, China: conservation threats and opportunities.	Journal	Cunningham, A. A., Turvey, S. T., Zhou, F., Meredith, H., Guan, W., Liu, X., Sun, C., Wang, Z. & Wu, M. 2015	Male	British	*Oryx*, Cambridge	http://journals.cambridge.org/action/displayFulltext?type=1&fid=9595703&jid=ORX&volumeId=-1&issueId=-1&aid=9595698
Using local ecological knowledge to assess the status of the Chinese giant salamander in Guizhou Province, China.	Journal	Pan, Y., Wei, G., Cunningham, A. A.*, Li, S., Shu, C., Milner-Gulland, E. J. & Turvey, S. T. 2015	Female	Chinese and British	*Oryx*, Cambridge	http://journals.cambridge.org/action/displayFulltext?type=1&fid=9595712&jid=ORX&volumeId=-1&issueId=-1&aid=9595687
Failure to detect the Chinese giant salamander (*Andrias davidianus*) in Fanjingshan National Nature Reserve, Guizhou Province, China.	Journal	Tapley, B., Okada, S., Redbond, J., Turvey, S.T., Chen, S., Lü, J., Wei, G., Wu, M., Pan, Y., Niu, K. & Cunningham, A.A. 2015	Male	British	*Salamandra*.	*Salamandra*.
Xingda's Wildlife Explorations in Fanjingshan – Song by the river	Book Chapter	Chen, S., Tapley, B., Lv, J.C.2015	Female	Chinese	Guizhou Science & Technology Press, Guiyang	Guizhou Science & Technology Press
Using the Chinese Giant Salamander to	e-poster	Chen, S., Zeng, Y., Niu, K.F., Wu, X., Cunningham,	Female	Chinese	IUCN World Park Congress	http://wpc2014.digitalposter.com.au/

Inspire Endangered Species and Freshwater Ecosystem Conservation in Fanjingshan National Nature Reserve		A.A. 2014				
On the hunt for wild Chinese giant salamanders.	Newsletter	Meredith, H.	Female	British	Salamander News N0. 11, November 2014, pp. 15-16	Partners in Amphibian and Reptile Conservation http://www.parcplace.org/parcplace/images/stories/YOSal/SalamanderNewsNovember.pdf

- **Annex 4 Onwards – supplementary material (optional but encouraged as evidence of project achievement)**

Copies of the protocols and questionnaires, MoUs, Letter of Agreement, educational materials, documentary film, conference abstracts, survey results 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.

- **Checklist for submission**

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	x
Is your report more than 10MB? 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.	x
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	x
Have you completed the Project Expenditure table fully?	x
Do not include claim forms or other communications with this report.	

Appendix 1

"A Sustainable Future of the Chinese Giant Salamander' project

3rd annual project workshop (30-31 March 2015) external review by Michael Lau

Observations:

- During the first day of the workshop, progress review was carried out by the project partners covering four main areas: (1) field surveys; (2) conservation genetics; (3) disease; and (4) training, education and public awareness.
- On the second day, work plans and future actions were discussed.
- Major achievements have been gained in all fronts and this is remarkable considering the difficulty of working on a Critically Endangered species in which the wild populations have been severely depleted and not much is known about its wild status. The many captive breeding farms across China, the normal practice to trade CGS among them and the release of farmed animals into the wild for restocking by Fisheries Department add complexity to this project.
- Several teams of young scientists trained in different disciples are particularly impressive.

Major Gaps:

- Need to find out more about the government programme of releasing farmed CGS to natural habitats for restocking, determine how successful they are and influence their execution so that they will be able to achieve the conservation goals while minimizing the risks of genetic contamination, spreading of disease etc.
- Need to study the genetics of more known wild individuals of CGS in order to better understand the genetic differentiation within this species and across drainages.

Challenges:

- Very small, scattered wild populations over wide geographic area.
- Still subject to collecting.
- Breeding farms very successful and producing millions of larvae yearly.
- Diseases still an issue, gather more info on the outbreak.
- Market price fluctuates tremendously. There seems to be a limited demand by consumers and price declines recently. This may affect the commercial viability of many farms. Then what will happen to these farms and their captive CGS ?
- How to secure/build up viable wild populations from the main genetic lineages?
- A critically endangered iconic species that requires strong conservation actions in one hand and being marketed for consumption in the other. How to come up with actions, education, communication that can ideally bring the two together or at least reduce the conflict?

Suggestions:

- If possible, field surveys per site should be extended for a couple of more days in order to increase the trapping success.
- Identify the interrelationships between breeding farms and wild populations. Need to be work out the key negative impacts, eg spreading of disease and collecting pressure, and, positive opportunity such as individuals for restocking/reintroduction. Then work on how to minimize the negative impacts and develop the positive opportunity.
- Geographically too large for conservation actions to cover the entire range, need to prioritise sites/pilot projects.
- Is the Fanjingshan Conservation Breeding Centre really needed at this stage? Need more baseline information, e.g. status and trends of wild populations, threats, etc in that area. Also assess the risks of disease spread, resource drain and shifting focus. Long-term sustainability and exist strategy of such a programme should also be carefully thought through.
- Engage Agriculture Ministry on their new CGS release actions and marking systems in order to improve the release programme and ensure conservation gains.

Appendix 2

Letter from the British Ambassador, British Embassy, Beijing.

British Embassy
Beijing

British Embassy Beijing
11 Guang Hua Lu
Jian Guo Men Wai
Beijing 100600
People's Republic of China

Tel: (0086 10)5192 4231
Fax: 0086 10 5192 4419

Executive Office email:
Alison.Burke@fco.gov.uk
www.ukinchina.fco.gov.uk

From the Ambassador
Ms Barbara Woodward CMG OBE

23 April 2015

Ms Chen Shu
Zoological Society of London

Dear Ms Chen

The Duke of Cambridge's visit to Beijing, Shanghai and Yunnan earlier this month was a great success. The visit covered a range of issues, including the importance of protecting endangered species and combating illegal wildlife trafficking - a subject which His Royal Highness is very passionate about.

This would not have been possible without the support of our partners and I would like to thank you for attending the NGO roundtable discussion on IWT issues in Shanghai. As was evident during the discussion, His Royal Highness is very appreciative of the hard work that you and other NGOs are doing to combat IWT and encourages you to continue this important work - including by collaborating with other NGOs and continuing to reach out to a broader base bringing in both the younger and older generations in China.

Yours sincerely

Barbara Woodward