

FINAL REPORT OF THE CLP PROJECT: FRESHWATER TURTLE CONSERVATION IN THE NANLING NATURE RESERVE, GUANGDONG, CHINA

(Duration: from 1st May 2009 to 30th June 2010)

Submitted by Shiping Gong

South China Institute of Endangered Animals, No.105, Xin Gang West
Road, Guangzhou 510260, China; Email: gongsp@gdei.gd.cn



Platysternon megalephalum

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Summary

The Nanling Nature Reserve (NNR), one of the critical areas for biodiversity conservation, is located in the Nanling Mountain Ecoregion, northern Guangdong, China. There are at least seven endangered freshwater turtle species native to NNR. Poaching pressure is a very real threat for these turtle species. However, little has been done to evaluate the impact of illegal activities on wild turtle population or to control the overexploitation for endangered turtles. This project aims to produce a scientific basis for effective management, and to promote the conservation of freshwater turtles in NNR. The objectives of this project are (1) to determine the status of wild turtle populations; (2) to evaluate the impact of human activities on wild turtle populations; (3) to build the capacity of local conservationists and wildlife managers; and (4) to raise local people's conservation awareness. In this project, fieldwork, market survey, interview survey, and educational activity were conducted during May 2009 - June 2010. The results reveal that (1) only four turtle species (six *Platysternon megacephalum*, four *Geoemyda spengleri*, three *Sacalia bealei*, two *Pelodiscus sinensis*) were found and the wild population was at the verge of extinction, and some species even extinct in field; (2) illegal trade and over-harvesting was the largest threat to these turtle species in NNR; (3) local people's conservation awareness was poor. This project produced an important scientific basis for turtle conservation in NNR, and introduced conservation conception to local people and government officials. In addition, some other rare species were also found in study area.

Introduction

China has one of the world's richest freshwater turtle faunas (Zhao et al., 2000), but it is also a major consumer of turtles (Ades et al., 2000; Compton, 2000; van Dijk, 2000). Almost all Chinese turtle species have been impacted by illegal trade, over-collecting, and habitat destruction in recent decades (Zhao, 1998; de Bruin & Artner, 1999; Lau & Shi, 2000; Shi et al., 2004; Gong et al., 2005; Gong et al., 2009). The wild turtle populations have declined drastically and about 80% species are designated as CR or EN by IUCN and Red List of Chinese Threatened Species (Zhao, 1998; Wang and Xie, 2004; IUCN, 2009). The Nanling Nature Reserve (NNR) is a hotspot for turtles and at least seven endangered freshwater turtle species have been found in NNR (Pang, 2003; Gong et al., 2007). It is very important to protect the turtles in NNR.

In recent decades, illegal trade, over-harvesting and habitat destruction have been threatening the turtle populations in NNR (Gong et al., 2007). Although wild turtles are protected by China's law, they can be found in food/pet markets in Guangdong. Illegal trade/harvesting is still a large threat to turtles (Gong et al., 2007; Gong et al., 2009). However, little has been done to evaluate the impact of illegal activities on wild populations or to assess the population status of wild turtles. Without effective conservation actions and strategies, the remaining turtles could continually suffer the impact of illegal trade and over-harvesting.

The NNR, the biggest nature reserve in Guangdong Province with an area of 58, 400 ha ($112^{\circ}30' \sim 113^{\circ}04' E$, $24^{\circ}37' \sim 24^{\circ}57' N$), covering three cities (Ruyuan, Yangshan and Lianzhou of northern Guangdong), is located in the center of the Nanling Mountain Ecoregion (Figure 1), and it includes c. 78% remains intact subtropical rainforest.

In addition, NNR is one of the 14 areas designated as a globally critical area for biodiversity in China, and one of the "Global 200" by WWF (Zhao et al., 2000), containing 85% rare and protected terrestrial species in southern China (Pang, 2003). NNR is a key protected site not only for freshwater turtles, also for many other rare animals and their habitat.

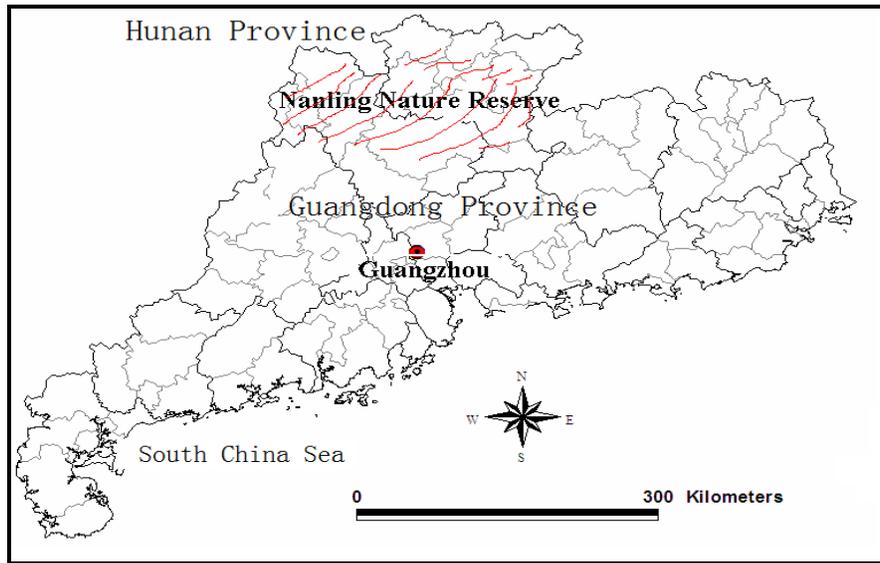


Figure 1. The location of Nanling Nature Reserve, north Guangdong, China

Key partners and their roles

Mr. Benliang Hu (Lianzhou Forest Bureau) , Mr. Zhiming Chen, Mr. Yuening Gong (Nanling Nature Reserve) , helped to convoke local governmental officials, villagers, students and teachers to join the conservation educational activities. Mr. Zhiming Chen, Mr. Yuening Gong also organized nature reserve staff to participate in fieldwork, training, and market survey. Mr. Guihong Zhang, Dr. Mingxia Zhang (Wildlife Conservation Society) , helped to train college student volunteers and provided instructive advice for this project. Dr. Michael Lau (Kadoorie Farm & Botanic Garden, Hong Kong), Prof. Haitao Shi (Hainan Normal University), Mr. Mike Cline (Guangzhou Nanhu International School) helped to train volunteers and provided instructive advice for this project.

Project members

Dr. Shiping Gong, 34 years of age, majoring in animal ecology in Beijing Normal University (2001-2006), an assistant researcher in South China Institute of Endangered Animals (from 2007 to present). During 2006-2007, as a leader, he once conducted a field

survey of freshwater turtles in Guangdong. In this project, he was in charge of project designing, education/training and market survey.

Dr. Fumin Wang, 33 years of age, majoring in veterinarian in South China University of Agriculture (2003-2006), an animal conservation official in Guangdong Provincial Wild Animal Rescue Center from 2006 to present. In 2006, as logistics coordinator and expert of amphibians and reptilians, he joined in the rain forest expeditions and market survey in northern Guangdong. In this project, as the team member, he was in charge of logistics, fieldwork.

Ms. Lihua Zhou, 28 years of age, majoring in animal science in South China University of Agriculture (2004-2008), an assistant researcher in South China Institute of Endangered Animals (from 2009 to present). In 2009, as a logistics coordinator, she ever participated in rain forest expeditions in eastern Guangdong. In this project, as the team member, she was in charge of education activity, training, logistics. She also joined in fieldwork and educational activities.

Mr. Haijing Wang, 28 years of age, BSc, majoring in wildlife conservation in Northeast Forestry University(2004-2007), a master student in South China Institute of Endangered Animals (2007-2010). In 2007, as a logistics coordinator, he ever participated in the rain forest expeditions in northern Guangdong. In this project, as a team member, he was in charge of fieldwork, market survey, and questionnaire survey.

Mr. Changteng Yang, 29 years of age, BSc, majoring in forestry in Guangdong Forestry College (2004-2006), a manager in Nanling Nature Reserve (from 2006 to present). In 2007, as a member, he ever participated in a rain forest expeditions in northern Guangdong. In this project, as a team member, he was in charge of fieldwork, questionnaire survey, and community affairs.

Mr. Dongsheng Pan, 25 years of age, BSc, majoring in forestry in Shaoguan Forestry College (2004-2006), a manager in Guangdong Daxiagu Nature Reserve (from 2006 to present). In 2007, as a member, he ever participated in a rainforest expeditions in northern Guangdong. In this project, as a team member, he was in charge of fieldwork, market survey and questionnaire survey.

Mr. Guangqiao Liao, 25 years of age, BSc, majoring in biology in Hainan Normal University (2006-210). In 2008, he ever participated in a rain forest expeditions on Hainan

Island. In this project, as a team member, he was in charge of fieldwork and market survey.

Aim and objectives

The main aims of this project are to produce a scientific basis for an effective conservation strategy and action, and to promote the conservation of wild freshwater turtles in NNR, Guangdong, China.

The objectives of this project are (1) to determine the status of wild turtle populations; (2) to evaluate the impact of human activities on wild populations; (3) to build up the capacity of local young conservationists and wildlife officers; and (4) to raise the public awareness.

Methodology

Objective 1: determine the status of wild turtle populations

Three methods were used to determine the status of wild turtle populations, field survey, market survey, and interview.

Interview The interviews were conducted in the local schools and villages. Over 300 local villagers, students, and staff of NNR were visited for information about the species, distribution, population status, habitat, and threatening factors of freshwater turtles, such as illegal harvest and trade. For questions regarding to the turtles, a set of pictures of the local turtles were shown to the interviewees. In addition, we visited the staff of local nature reserves to collect information about turtles. Questionnaire survey also was conducted during the interviews. SPSS statistics software and nonparametric tests were used to analyze the questionnaire data.

Market survey Market survey was conducted in the four important animal markets of four cities around NNR, including Shaoguan, Ruyuan, Yangshan and Lianzhou. We visited these markets 1-2 times in each season during April 2009 - June 2010, to collect

information on the turtle trade. Turtle traders in these markets were often reluctant to share information with us because they worried about possible punishment by wildlife managers. We pretended to be potential buyers, to gather information, including species, their quantities, prices and origins of turtles on display. Data were either recorded in small, secret notebooks or memorized and then recorded in notebooks a short distance from the stores. Market survey can help us to understand the population status of turtles and the impact of illegal trade.

Field survey The NNR is composed of four main regions. Based on interviews, literatures, information from local experts, eight representative streams (including all typical habitats), elevation range 400-1300 m, totalling fifty km, were selected for field survey. Field survey was conducted during June – September when turtles are active. Cage-ensnaring (cage with beef bait, see Figure 2) and visual searching were used to determine turtle presence and relative abundance. These methods had been used to study freshwater turtles (Gong et al., 2006). In order to understand the habitat of turtles, we also recorded the natural conditions of streams. In each stream section, over 10 plots (10 m x 20 m) were sampled and the natural factors (such as vegetation, climate, foods, water quality, other wild animals) were also determined. The survey results provide scientific data for analyzing the current status of the turtle populations. SPSS statistics software and nonparametric tests were used to analyze the field data.



Figure 2. Two types of turtle cages used in field survey.

Objective 2: evaluate the impact of human activities on wild turtle population

During field survey and interviews, we try to collect information on the threats to turtles. To look for turtle cages used by illegal hunters in field and villages is a good approach to understand the threats from illegal harvest. Based on the data from interviews, market survey, field survey, and questionnaire survey, we can evaluate the impact of human activities on wild population.

Objective 3: build the capacity of local conservationists and wildlife officials

There are very few conservationists who pay attention to turtle conservation in China. Local conservationists and wildlife officials also lack knowledge and skills for turtle conservation. So, we tried to recruit young conservationists and wildlife officials to join this project and build up their capacity in turtle conservation. A total of five main team members from local institutes, nature reserves, and government, were involved in this project. Each of them plays a role to conduct a section of this project (please read the key partners and project members for detail). In addition, twenty college student volunteers were recruited from local universities and nature reserves. We invited the advisors of this project to train team members and let them obtain knowledge and skills for turtle conservation (Figure 3). Some good presentations, CDs, handbooks were given to team members and volunteers during training.



Figure 3. Project advisors were invited to train volunteers

Objective 4: to raise the public awareness

Education is a good approach to raise the public awareness. In this project, we selected four important sites to conduct educational activities and students, teachers, villagers, nature reserve staff, government officials were invited to join the education activities. Our team members, college student volunteers gave a series of presentations for the public. Handbooks, leaflets, T-shirts also were made and were distributed to local public. In addition, we involved magical play, dancing, and music to education activities to make them more interesting. In order to enlarge the effect of these activities and provide more chance for the local people, we invited local TV stations, and newspapers to transmit the knowledge and concept of conservation.

Outputs and Results

Outputs of ecological sciences

During field survey, four turtle species (six *Platysternon megacephalum*, four *Geoemyda spengleri*, three *Sacalia bealei*, two *Pelodiscus sinensis*) were found and the population densities were very low (c. 0.1 individuals per sq.km.) (Figure 4). There are no historical data that can be used to compare the population densities because no scientific survey of turtles has been conducted in this area before. Based on our interviewing with local villagers, the turtle populations had suffered extensive poaching. All species were at the verge of extinction, and some species even extincted, such as *Cuora trifasciata*, and *Pelochelys cantorii*. In addition, we found c. 40 turtle cages were set illegally by hunters in fields, which implied illegal harvesting still occurred in NNR. The vegetation in the habitat of turtles looks good, but some sections of streams have been destroyed by the dams of hydropower plants.

Besides turtles, we also found some other wild animals during field survey (see appendices for details), one of them is a very rare snake species *Protobothrops cornutus*

(Figure 5). Previously, this snake species was only found in Vietnam, only a few specimens. This species is classified as Data Deficient (DD) on the IUCN Red List. This means that there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. This finding has confirmed the nature existence of this snake species in China, and it provides important information on study and conservation of this species. The taxon of these specimens found in China was also studied and the article is in press at present.



Figure 4. Big-headed Turtle and Black-breasted Leaf Turtle were found in field in Nanling Nature Reserve in 2009.



Figure 5. *Protobothrops cornutus* (Smith, 1930) found in Nanling Nature Reserve, Guangdong, China. (Photo by Shiping Gong in July 2009)

During market survey, a total of 30 chelonian species were found in the markets of northern Guangdong (Figures 6-7). Of them, 17 species are native to China and 10 species native to Guangdong (Table 1). Most of the species are endangered species and were protected by CITES and the wildlife protection law of China. Based interviews, we found most of local species were harvested illegally in Nanling area. Longtime over harvesting has pushed all species to the verge of extinction. In order to meet the huge market demand, a lot of turtles were smuggled to these markets. Almost all turtles in these markets were used for food. Our survey indicates that illegal chelonian trade has caused over-harvesting and has heavily impacted the wild turtles in Nanling area.



Figure 6. Market survey in Shaoguan, northern Guangdong, in December 2009. Over 20 turtle species were found.



Figure 7. Market survey in Ruyuan and Yangshan, northern Guangdong, in August 2009. Some Big-headed Turtles were found in local markets.

Based on interviews, we found that local people's conservation awareness was rather poor. Even in nature reserve, the staff lacked knowledge on turtle conservation and did not take effective measures to prohibit illegal turtle harvesting. The remaining turtle populations in NNR are still facing the large threat of trade and harvesting. Urgent measures should be taken to change this bad situation. We have presented some recommendations for effective conservation of turtles in NNR and Guangdong. The copies of these recommendations have been sent to NNR and wildlife managers of Guangdong Provincial Government and National Forestry Ministry of China. Following our recommendations, the NNR has improved their patrol scheme and identified some key area to protect turtles. Some new conservation projects have also been conducted to survey the status of endangered animals. Local forestry department has conducted a programme to control illegal trade in turtles and rescue wild turtles from illegal markets.

Table 1 Approximate number of individual turtles per species found in the markets of northern Guangdong, with their IUCN Red List category (IUCN, 2010) and CITES Appendix listing (CITES, 2010), and the countries to which they are native (Zhou, 2004; Shi, 2008).

Species names	¹ No. of Individuals	² Red List category (IUCN, 2010)	CITES Appendix (2010)	Native to
<i>Platysternon megacephalum</i>	+++	EN	II	China
<i>Mauremys reevesii</i>	++++	EN	III	China
<i>Mauremys nigricans</i>	+	EN	III	China
<i>Cuora mouhotii</i>	++	EN	II	China
<i>Geoemyda spengleri</i>	+	EN	III	China
<i>Mauremys mutica</i>	++++	EN	II	China
<i>Cuora galbinifrons</i>	++	CR	II	China
<i>Cuora bourreti</i>	++	CR	II	
<i>Cuora amboinensis</i>	+++	VU	II	China
<i>Cuora flavomarginata</i>	+	EN	II	China
<i>Sacalia bealei</i>	++	EN	III	China
<i>Sacalia quadriocellata</i>	++	EN	III	China
<i>Ocadia sinensis</i>	++++	EN	III	China
<i>Cyclemys dentate</i>	++++	/	/	China
<i>Heosemys annandalii</i>	+	EN	II	
<i>Heosemys grandis</i>	++	VU	II	
<i>Melanochelys trijuga</i>	++	/	/	
<i>Siebenrockiella crassicollis</i>	++++	/	II	
<i>Callagur borneoensis</i>	+	/	II	
<i>Indotestudo elongata</i>	++++	EN	II	China
<i>Manouria impressa</i>	+	/	II	China
<i>Chrysemys picta bellii</i>	+	/	/	
<i>Trachemys scripta elegans</i>	++++	/	/	
<i>Chelydra serpentina</i>	+++	/	/	
<i>Macrolemys temminckii</i>	++	/	III	
<i>Pelodiscus sinensis</i>	++++	VU	III	China
<i>Palea steindachneri</i>	+	EN	III	China
<i>Apalone ferox</i>	++	/	/	
<i>Lissemys scutata</i>	+	/	II	
<i>Carettochelys insculpta</i>	+	/	II	

Note: 1 : +, 1–50; ++, 51–100; +++, 101–200; +++++, >200 ; 2: CR, Critically Endangered; EN, Endangered; VU, Vulnerable

Outputs of social science activities

A total of seven presentations on the conservation of turtles and other wildlife were made for students, teachers, nature reserve staff, wildlife managers, customs inspectors, government officials (Figures 8-11). Over 1000 wildlife conservation handbooks and booklets were distributed to local students, teachers, villagers, nature reserve staff and governmental officials. Sixteen posters were designed and exhibited in local nature reserves and schools (Figure 8). Eight workshops were held in institutes, nature reserves, schools and customs (Figure 10 and Figure 13). Over 500 college student volunteers, teachers, students, villagers, nature reserve staff, NGOs and government officials attended these workshops. Over 200 local villagers, students and teachers were visited and c. 200 questionnaires were completed (Figure 12). The result indicates that local people's knowledge on wildlife conservation is very poor. Most of people (about 60%) don't think wild animal need conservation and they often collect turtles and other wildlife for sale or food. After educational activities, most of people think this is a very good activities and they learn a lot of knowledge on wildlife. Some local governmental officials and nature reserve staff also think this is a special education for them. Local students think they learn a lot of knowledge on wildlife conservation through these activities.

In addition, our educational activities were reported in the local public media, such as Guangzhou Daily, Nanfang Daily, Guangdong Science and Technology News, Lianzhou City TV News. Some webstations also disseminated this news. Through wide reporting, our educational activities have produced a positive impact on wildlife conservation. More and more people could learn knowledge on wildlife conservation. Local people's conservation awareness was greatly improved.

Through education and training, the capacity of local young conservationists and wildlife officers was built up, and conservation conception was introduced to local communities. Wildlife managers could understand the status of wild turtles and consider effective conservation strategies and policy. Local public are able to understand why the turtles/wildlife need to be protected, and what they can do for turtle conservation. Two articles have been published in the scientific journal -Amphibia-Reptilia (2011,Volume 32, pp: 132-135) and popular magazine - Guangzhou Daily (Page A19, June 9, 2010). A

Conservation Action Plan has been prepared for turtle conservation in NNR. In this plan, we expand turtle conservation education and distribute turtle conservation handbook/leaflets in more villages around NNR. We have distributed over 5000 handbook/leaflets during 2011-2013. We also plan to establish a turtle conservation centre for the wild turtles rescued from illegal markets. At present, we are seeking support for this programme.



Figure 8. Poster exhibition in Nanling Nature Reserve in 2010.

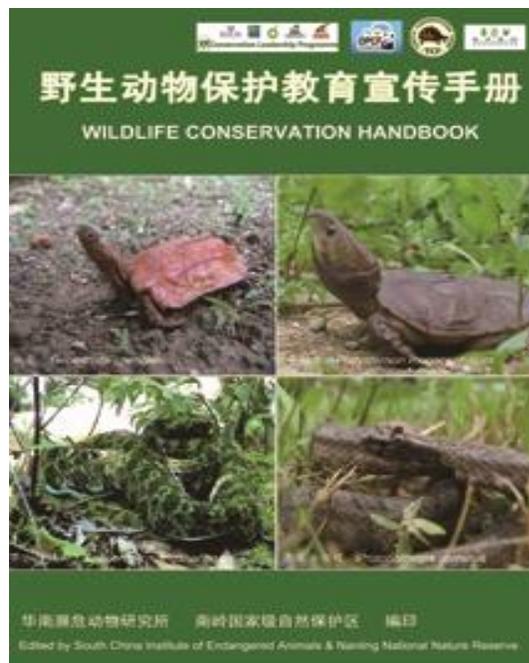


Figure 9. Handbook used in education/training activities.



Figure 10. Lectures on wildlife conservation, in local nature reserves/ schools.



Figure 11. Wildlife conservation educational activities.



Figure 12. Questionnaire survey in villages around NNR.



Figure 13. Workshops for turtle species identification and training of customs inspectors and wildlife managers from Guangdong, Hongkong, and Macao of China during Jan-May

2010. Guangdong Provincial Forestry Bureau and Wildlife Conservation Society help to hold these activities.

Achievements and Impacts

This project has gotten some key results. The result of fieldwork shows that the population densities of turtles are very low and all species are at the verge of extinction, some species even become extinct. This result implies that the illegal harvesting is active. Illegal chelonian trade has caused over-harvesting, which has heavily impacted the wild turtles in Nanling area. Local people's conservation awareness is poor, and no effective measure has been taken to prohibited illegal turtle harvesting in NNR. Based on these key results, we can evaluate the current status of wild turtles in NNR and analyze the problems. These key results are the important base for future conservation action plan, and have wider significance to the conservation of turtles and other wild animals in NNR.

Based on the results of this project, we have assessed the status of turtles in NNR. How to effectively prohibit illegal trade and harvesting is the key problem for turtle conservation. We have submitted the conservation recommendations and conservation action plan to local governments. Under the support of local government and nature reserves, conservation educational activities and training of customs inspectors and wildlife mangers have been conducted successfully. These activities will help to build the capacity of local conservationists and wildlife managers, to improve the enforcement of wildlife protection law, and to raise local people's awareness. The capacity of college student volunteers and main team members of this project has been built up and they will promote wildlife conservation cause in their future work.

Conservation recommendations

Based on the results of this project, we discussed the future conservation plan and presented some recommendations for effective conservation and management of turtles in NNR, with the help of local experts, nature reserve managers, and government officials. Our recommendations are the following: (1) Local government needs to strengthen enforcement of existing legislation and regulations concerning the protection of turtles,

this will require a clear enforcement responsibilities of wildlife managers. (2) To build up the capacity of wildlife managers is necessary, such as the skill for turtle identification in markets. (3) Turtle traders in the markets should be required to show the appropriate permits and documentation to buyers and wildlife managers, with information on species, number, and origins of turtles to prove legitimacy. (4) List all local turtle species on the list of key state-protected species, while list NNR as a key protected area for turtles and other animals. (5) Local government, academic institutes and NGOs need to collaborate in long-term monitoring of the chelonian trade and the trend of wild turtle population. This will provide a useful insight into the pet turtle trade and the dynamics of wild turtle populations, and help wildlife managers to work effectively. (6) Local government need to provide special fund for futher fieldwork, market survey, education and training.

Conclusion

This project conducted one years' research on the status and conservation of freshwater turtles in NNR, Guangdong Province, South China, during 1 May 2009- 1 May 2010. The population status of freshwater turtles was accurately assessed by fieldwork, market survey, and interview. All turtle species were badly threatened by illegal trade and over harvesting, and these chelonian species were at the verge of extinction, some species even extinct. Conservation educational activities have been widely conducted to raise local people's awareness and to build the capacity of local young conservationists and wildlife mangers.

This study has produced a strong scientific basis for effective conservation and management. Some recommendations for effective conservation have been submitted to local/central government for further conservation policies and fund. Some recommendations have been considered by local government and nature reserves. Ubderr the support of Guangdong Provincial Forestry Bureau and Wildlife Conservation Society, workshops for turtle species identification and training of customs inspectors and wildlife mangers have been conducted to strengthen law enforcement to against illegal trade in

turtles. NNR has considered to conducted field monitoring of freshwater turtles. In addition, some rare wild animal species, such as *Protobothrops cornutus*, were found in field survey, and that will offer necessary information for conservationists. Some local medias were successssfully involved to report the knowledge and concept of wildlife conservation. This project imply that the strategy, “Research-Recommendation-Action-Participation” may be a good conservation solutions.

This project is very important to turtle conservation in NNR, Guangdong. It has produced positive impact on the conservation and management of the threatened turtle species. In addition, this project also promote the conservation of other endangered animals in northern Guangdong.

Problems encountered and lessons learnt

- Which project activities and outcomes went well and why?

Field survey, questionnaire survey, education/training activities went well, and got better outcomes. We think that the reasons for going well are the following: (1) Excellent advisors help to perfect project plan and offer support in fieldwork and education activities. (2) We selected 6 team members from local natue reserves and institute, and over 20 college volunteers from local universities. A series of training activities were conducted to build the capacity of teammembers and volunteers. So as to they can do all the work well. (3) The leaders of local government and nature reserves are very important for the carrying on this project, because they can give important support in fieldwork, education activities, and future conservation action plan. In this project, we have tried to obtain political support from the leaders of local government and nature reserves. (4) Local NGOs are also important. They can help to train volunteers and give good suggestions for project plan. (5) We cooperated with local popular medias, such as newspapers, TV Program. The media can help to publicize conservation concept.

- Please detail any problems that the project encountered or deviations from original project plans. Describe how these problems were addressed and what solutions were found to deal with these issues.

Some problems were encountered: (1) Some original team members, Mr. Heping Xie, Mr. Xiaobo Yang, Mr. Zhenyu Wen, had not enough time to participate in this project in 2009, because they have other new tasks to do. So we had to selected three new excellent members, Ms. Lihua Zhou, Mr. Dongsheng Pan, and Mr. Guangqiao Liao to replace them. (2) Usually, the leaders of local government and nature reserve do not pay attention to turtle conservation. In order to obtain their support, we tried to invite them to join our activities and introduced them the significance of this project. We also gave them some education materials, such as wildlife conservation handbooks, presentations. By this way, we finally attained their support. (3) In mountain area, local villagers are relative poverty, while the market price of wild turtles are high, which made it difficult to prohibit the illegal harvest in turtles. Although we had tried to introduce the concept of wildlife conservation, some local villagers did not think hunting turtle is illegal. Some villagers even continue to collect turtle in NNR. We think that patrol and law enforcement are important for prohibiting illegal issues.

- Briefly assess the specific project methodologies and conservation tools used.

The methodologies used in this project are successful. These methodologies have been used successfully in many other studies (Gong et al., 2006; Gong et al., 2009). Here we want to introduce the design of conservation handbook. During education activities, we designed new wildlife conservation handbook and posters, a lot of beautiful photos of local turtles and other animals were used. Some usefull knowledge on relationship between wildlife and human beings was introduced on the handbook. In addition, we left 30 blank pages to make handbook as a notebook. Some students and villagers may use it as personal notebook for a long time. By this way, the handbook can be functional more permanent. Media is a very good tools for conservation education. Most of people hope themselves were reported on newspapers or TV programs, so they are active to participate in our activities. In addition, our project programme can receive extensive publicity in various media.

- Please state important lessons which have been learnt through the course of the project and provide recommendations for future enhancement or modification to the project activities and outcomes.

There are two important lessons. One is that the team leader must study how to let the leader of local governments, nature reserves, or communities pay attention to the conservation issues, and let them support or join the conservation actions. The other is that medias (newspapers, internet, TV programs etc.) is a very important conservation tool to raise people's awareness.

In the future

Through this project, we have understood the status of the freshwater turtles in NNR. Some recommendations have been presented. In future, we will continue to cooperate with local NGOs (such as Wildlife Conservation Society, Green Eyes) and local universities, nature reserves and government, to conduct a longtime conservation action plan. Conservation fund will be applied from local government and some NGOs. The trend of wild turtle populations and illegal trade will be continually monitored. For some critically endangered turtle species, such as Red-necked pond turtle (*Chinemys nigrigans*), we will conduct field ecological research, and consider a restoration plan of the wild turtle population. We will continue to help local wildlife managers to strengthen the enforcement of wildlife protection law, so as to control illegal trade in wild turtles. We will make a longtime conservation action plan to raise local people's conservation awareness and introduce conservation concept to local government officials.

Appendices

Please include important additional information not required in the main text along with:

- A full account of income and expenditure.

Itemized expenses	Total CLP requested (USD)	Total CLP used (USD)
PHASE I - PROJECT PREPARATION		
Administration		
Communications (telephone/internet/postage)	100	200
Books and printing journal articles/materials	200	200
Insurance	100	100
Visas and permits		
Team training (Please detail: Transportation 200, food 200, materials 200)	500	600
Reconnaissance		
Medical supplies/first aid	600	500
Equipment		
Scientific/field equipment and supplies (Please detail: turtle cages 200, thermometer 100, work clothes 200, tool boxes 100, plastic bags 100	1300	700
Photographic equipment (Please detail: Batteries 50, camera 350)	200	400
Camping equipment (Please detail main items: sleeping bags 100, tent 100)	200	200
Field guides	300	400
Maps	50	50
Boat/engine/truck	400	200
Fuel	200	200
Other (Please detail: project management fee 750)	750	750
PHASE II - IMPLEMENTATION EXPENSES		
Administration		
Insurance	200	100
Transportation		
Fuel		
Trip to Brasilia to present Protectec Area proposal for government authorities		
Field vehicle maintenance		
Accommodation for team members and local guides (Please detail: During transportation (\$100 per day for 6 people * 8 days in the cities) 800)	1400	1800
In the field (\$50 per day for 6 people * 20 days) 1000)		
Food for team members and local guides (Please detail: Food in field (\$60 per day for 6 people * 30 days) 1800)	1200	1800
Transportation	2000	1500
Customs and port duties		
Workshops		
Outreach/education activities and materials (brochures, posters, video, t-shirts, etc.) (Please detail:	1900	2400

posters (\$10* 20) 200)		
t-shirts (\$5* 200) 1000)		
Other (Please detail: brochures \$1* 1000, leaflet \$ 200)1200)		
PHASE III - POST-PROJECT EXPENSES		
Administration		
Report production and results dissemination	800	300
Other (Please detail:)		
Total	12400	12400

- Raw field data: if large amounts of data were generated, include them here and summarise results using tables and statistics in the main text.

During field survey, four turtle species (six *Platysternon megacephalum*, four *Geoemyda spengleri*, three *Sacalia bealei*, two *Pelodiscus sinensis*) were found and the population densities were very low (c. 0.1 individuals per sq.km.). In addition, over 40 other species were found in in NNR (Table 2).

Table 2 Amphibian and reptile found in Nanling Nature Reserve, Guangdong, China, during 2009-2010

No. of species	Scientific names	No. of species	Scientific names
	Turtles	31	<i>Protobothrops mucrosquamatus</i>
1	<i>Geoemyda spengleri</i>	32	<i>Protobothrops cornutus</i>
2	<i>Sacalia bealei</i>	33	<i>Trimeresurus stejnegeri</i>
3	<i>Pelodiscus sinensis</i>	34	<i>Naja naja</i>
4	<i>Platysternon megacephalum</i>	35	<i>Bungarus multicinctus</i>
	Lizards		Frogs
5	<i>Lygosoma indicum</i>	36	<i>Bufo melanostictus</i>
6	<i>Tropidophorus sinicus</i>	37	<i>Bufo ledongensis</i>
7	<i>Eumeces elegans</i>	38	<i>Bufo gargarizans</i>
8	<i>Eumeces chinensis</i>	39	<i>Brachytarsophrys carinensis</i>
9	<i>Calotes versicolor</i>	40	<i>Megophrys mangshanensis</i>
10	<i>Acanthosaura lepidogaster</i>	41	<i>Vibrissaphora liui yaoshanensis</i>

- 11 *Takydromus septentrionalis*
12 *Gekko chinensis*

Snakes

- 13 *Boiga multomaculata*
14 *Cyclophiops major*
15 *Xenochrophis piscator*
16 *Zoacys dhumnades*
17 *Oligodon ornatus*
18 *Oligodon catenata*
19 *Opisthotropis latouchii*
20 *Opisthotropis cheni*
21 *Dinodon flavozonatum*
22 *Macropisthodon rudis*
23 *Amphiesma bitaeniatum*
24 *Lycodon fasciatus*
25 *Elaphe taeniura*
26 *Elaphe carinata*
27 *Enhydris chinensis*
28 *Sinonatrix percarinata*
29 *Sinonatrix annularis*
30 *Calamaria septentrionalis*

- 42 *Fejervarya limnocharis*
43 *Hylarana guentheri*
44 *Odorrana margaratae*
45 *Odorrana schmackeri*
46 *Rana zhenhaiensis*
47 *Limnonectes fujianensis*
48 *Paa exilispinosa*
49 *Paa spinosa*
50 *Microhyla butleri*
51 *Rhacophorus megacephalus*
52 *Rhacophorus dennysi*
53 *Hyla chinensis*
54 *Amolops ricketti*
55 *Microhyla pulchra*
56 *Microhyla pulchra*

Salamandrids

- 57 *Pachytriton labiatus*
58 *Pachytriton brevipes*

- Copies of any newspaper/magazine articles relating to the project.



Educational activity (right) was reported on Nanfang Daily of Guangdong, China

粤港大学生携手宣传野生动物保护

2010-06-11 11:02:46 作者：冯海波 来源：广东科技报 Tag：

走进南岭国家级自然保护区

粤港大学生携手宣传野生动物保护

本报讯（记者 冯海波通讯员 龚世平）在今年世界环境日期间，来自香港中文大学、中山大学、华南理工大学等粤港地区8所高校的20多名大学生环保志愿者走进南岭国家级自然保护区，开展了以“关爱野生动物，我们携手同行”为主题的粤港大学生志愿者野生动物保护科普教育活动。

南岭国家级自然保护区是广东省面积最大的自然保护区，野生动植物资源十分丰富，并且在调节气候、保持水土、维护生态平衡方面发挥着重要作用。然而，当地群众保护野生动物的意识薄弱，猎捕和食用野生动物的现象比较常见。为进一步宣传和普及野生动物保护知识与野生动物保护法，帮助山区群众树立生态环保意识，广东省科学院华南濒危动物研究所和南岭国家级自然保护区联合组织了此次活动。

为提高宣教活动的效果，激发公众参与兴趣，本次活动特意把野生动物保护知识融入到精美的图片展览、演讲、魔术表演、舞蹈、互动游戏、有奖竞答、多媒体报告等生动活泼、易于接受的活动之中。现场还发放了精心设计的《野生动物保护教育宣传手册》，该手册运用大量精美的粤北本地珍稀野生动物图片、配合通俗易懂的动物保护知识，图文并茂地介绍了保护野生动物的意义。此外，粤港大学生志愿者还在活动现场及保护区周边乡村开展了野生动物保护现状问卷调查，了解保护区周边群众对野生动物保护的态度和意识。

Educational activity was reported on Guangdong Science and Technology News of Guangdong, China

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粤港大学生世界环境日大东山宣传野生动植物保护

发布：2010-6-8 9:26:24 来源：转载 编辑：佚名



Educational activity was reported on Qingyuan Information harbor of Guangdong, China



Educational activity (at the bottom right) was reported on Guangzhou Daily of Guangdong, China

- Papers published or manuscripts proposed based on project data

The article below has been published by the Journal of Amphibian Reptilia.

Title: Is the horned pitviper *Ceratrimeresurus shenlii* Liang and Liu, 2003 from China a valid *Protobothrops*?

Abstract. Previous records of horned pitvipers from Vietnam and China are reviewed and the phylogenetic placement of four snakes from two sites in Tianjingshan Forest, China (Ruyan County, Guangdong Province; 24°43'N, 113°03'E, 563 m a.s.l.; 24°43'N, 113°02'E, 585 m a.s.l.) is examined. Using mitochondrial DNA sequence data (12S, 16S, ND4, cyt *b*; 2306 bp) and Bayesian and Maximum Likelihood analyses, the Tianjingshan

pitvipers are revealed as sister to *P. cornutus* with a differentiation resembling those of *P. flavoviridis* and *P. tokarensis*. This indicates a close relationship with *P. cornutus* and suggests that *Ceratrimeresurus shenlii* Liang and Liu, 2003, previously considered a junior synonym of *P. cornutus* (Smith, 1930), could be a valid subspecies of *P. cornutus* or a recently split distinct species. However, further studies and samples from intermediate localities are needed to decide whether the observed differentiation reflects a pattern of isolation-by-distance or a phylogeographic, and thus perhaps taxonomically relevant, break.

Keywords: Phylogeny, morphology, *Ceratrimeresurus shenlii*, *Protobothrops cornutus*, China, Vietnam

Is the horned pitviper *Ceratrimeresurus shenlii* Liang and Liu, 2003 from China a valid *Protobothrops*?

Shiping Gong¹, Ellen Hitschfeld², Anna K. Hundsdörfer², Markus Auer², Fumin Wang^{1,3},
Lihua Zhou¹, Uwe Fritz^{2,*}

Abstract. Previous records of horned pitvipers from Vietnam and China are reviewed and the phylogenetic placement of four snakes from two sites in Tianjingshan Forest, China (Ruyan County, Guangdong Province; 24°43'N, 113°03'E, 563 m a.s.l.; 24°43'N, 113°02'E, 585 m a.s.l.) is examined. Using mitochondrial DNA sequence data (12S, 16S, ND4, *cyt b*; 2306 bp) and Bayesian and Maximum Likelihood analyses, the Tianjingshan pitvipers are revealed as sister to *Protobothrops cornutus* with a differentiation resembling those of *P. flavoviridis* and *P. tokarensis*. This indicates a close relationship with *P. cornutus* and suggests that *Ceratrimeresurus shenlii* Liang and Liu, 2003, previously considered a junior synonym of *P. cornutus* (Smith, 1930), could be a valid subspecies of *P. cornutus* or a recently split distinct species. However, further studies and samples from intermediate localities are needed to decide whether the observed differentiation reflects a pattern of isolation-by-distance or a phylogeographic, and thus perhaps taxonomically relevant, break.

Keywords: *Ceratrimeresurus shenlii*, China, morphology, phylogeny, *Protobothrops cornutus*, Vietnam.

Until recently, the Chinese pitviper *Ceratrimeresurus shenlii* Liang and Liu, 2003 was overlooked by most authors (e.g., Gumprecht et al., 2004; Hermann et al., 2004; Zhao, 2006). This taxon was described as a new genus and a new species based on the first “horned pitviper” recorded from the People’s Republic of China, being characterized by horn-shaped supraocular scutes. The holotype of this taxon was collected in Wuzhishan Forest, Ruyuan County,

only from Vietnam (Hermann et al., 2004; Ziegler et al., 2006). In summer 2005 another horned pitviper was recorded from the Shimantai Nature Reserve (24°22'-24°31'N, 113°05'-113°31'E), about 60 km southeastwards from the type locality of *C. shenlii*. A second specimen was found in the home of a local villager, having been preserved in alcohol as medicinal liquor, and was assigned to *P. cornutus* as well (David et al. 2008). Four further spec-

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- ※ Shiping Gong, Fu Minwang, Lihua Zhou et al. Is the horned pitviper *Ceratrimeresurus shenlii* Liang and Liu, 2003 from China a valid *Protobothrops*? *Amphibian Reptilia* (in press). (※ by this project)
- ※ Zhou LH, Gong SP, Liao GQ, Li XZ, Chen ZM. A survey of the public awareness on wildlife conservation in Nanling area, Guangdong, China.(This article is being prepared at present). (※ by this project)

Address list and web links

(An annotated list of useful names, addresses and websites)

South China Institute of Endangered Animals, an important institute for wildlife conservation and management. This institute belongs to the Guangdong Provincial Academy of Science and the Forestry Ministry of China. Web link: www.gdei.gd.cn.

South China Project, WCS China, an important NGO for wildlife conservation education. Web link: <http://www.chinabiodiversity.com>.

Guangdong Provincial Forestry Bureau, an important governmental department for wildlife conservation and management. This department is in charge of relative policy making, wildlife management. Web link: <http://www.gdf.gov.cn>.

Nanling Nature Reserve of Guangdong, China, the biggest forestry nature reserve of Guangdong, China, with 80% terraneous vertebrates and many rare animals. Web link: <http://www.gdnl.org/wwwroot/index.asp>

Distribution list

South China Institute of Endangered Animals Address: No.105, Xin Gang West Road, Guangzhou 510260, Guangdong Province, P.R. China; Web link: www.gdei.gd.cn.

The Office for Wildlife Conservation and Management, Guangdong Provincial Forestry Bureau Address: No. 343, Zhongshanqi Road, Guangzhou 510260, Guangdong Province, P.R. China; Web link: <http://www.gdf.gov.cn>

Nanling Nature Reserve of Guangdong, Wuzhishan Town, Ruyuan 512727, Guangdong Province, China; Web link: <http://www.gdnl.org/wwwroot/index.asp>