

something about places where streams meandered through woodlands or prairies, or where rock formations offered refuges and prey. Experiencing a particular reptile meant getting out on a moonless night on the prairie, or walking a creek on a summer morning. Most of us who learned that way feel that we gained something irreplaceable. We found a connection to something that was fascinating and complex and beautiful. Seeing the bulldozer at work in those places creates a hurt that is like the loss of an old friend.

Do people who buy king snakes in deli cups come to care about wild king snakes and the places where they live?

Does the expo shopper driving home with a baby spotted turtle think about the connection between the life in the deli cup and the lives in the marshland by the highway? I don't know. However, I think that walking down aisles of reptilian merchandise is not nearly so direct a way of experiencing nature as walking through a marsh or prairie or woods. Those of us who care about herpetofauna as wildlife—and threatened wildlife at that—ought to do what we can to make sure that the deli cup is not the only habitat in which new generations of herpers get to experience a snake or turtle.

## The Fate of a Wild-Caught Golden Coin Turtle (*Cuora trifasciata*) on Hainan Island, China

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In August 2002 a female golden coin turtle (*Cuora trifasciata*) was caught in a rice field in the foothills of the Wuzhi Mountains in the Hainan Province of China (Fig. 1). The turtle was caught by a local villager just a few kilometers from my research site. After we heard of the capture, my students and I were anxious to see the turtle, and hopefully rescue it. I wasn't convinced it was really a wild-caught turtle. I also knew that I couldn't afford to buy it if it was. So my students and I invited Mrs Nan Wang Chen to join us when we went to see the turtle. Mrs Chen is the wife of Mingqiu Chen. They own the largest turtle farm in Hainan Province and have over 1000 golden coin turtles (Shi and Parham, 2001).

The turtle was not terribly beautiful (Fig. 2). It weighed 850 g and had a straight carapace length of 18.57 cm, width of 12.68 cm, and height of 7.00 cm. Using the relatively clear annuli, I estimated that the turtle was 8–10 years old. Upon seeing the turtle, Mrs. Chen was convinced that this was indeed a wild-caught animal. In her experience wild turtles are usually relatively narrower and longer with a darker brown carapace and clearer growth annuli. Their

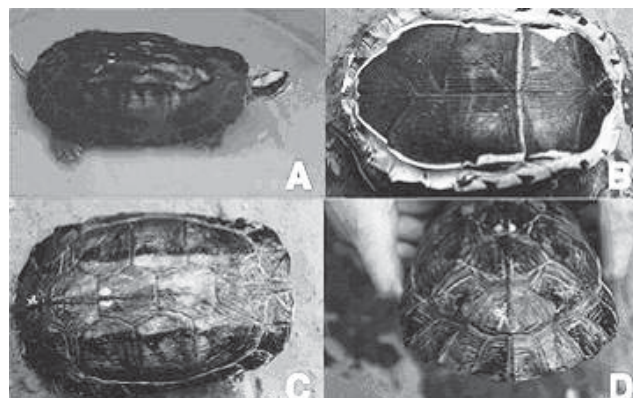
limbs are not as bright orange in color and they are far more timid than captive-reared turtles.

She offered the dealer 15,000 Yuan/kg (~\$1900 USD). When he refused, she offered 15,600 and then 16,000 Yuan/kg. Still, the turtle dealer refused to part with the turtle. Ultimately, we left the village without the turtle. The asking price was 19,000 Yuan/kg (>\$2000 USD/kg). The dealer claimed that his price was reasonable. According to him wild males are even more expensive and may sell for as high as \$3000 USD/kg because there is a shortage of males in captivity. He said that if the turtle had been captive bred, the price would be as low as \$240–360 USD/kg. The price for this wild-caught turtle is much higher than previously reported. De Bruin and Artner (1999) reported a price of \$300–\$500 USD each. In 1998, Zhao gave a price of \$40 USD/kg, but by 2000 (Lau and Shi, 2000; Wong, 2002) prices were around \$1000 USD/kg.

I was surprised to learn that almost every villager, even in the most remote and inaccessible villages, knows the present price of these turtles. It is primarily the Miao (also known as the Hmong) minority who live in the mountainous areas that hunt the turtles. They are quite skilled. Several shopkeepers in Changsha Town said that the Miao use the store telephones to call dealers late at night when nobody is



**Figure 1.** Site of capture and villager who found a wild female golden coin turtle (*Cuora trifasciata*) in a rice field in the foothills of the Wuzhi Mountains in Hainan Province.



**Figure 2.** Wild-caught golden coin turtle.

around. As part of the selling process, they are brought to the city and treated to a few days of hospitality. There are 15 stores on one street in Zhong Ping that purchase turtles. Because the trade is illegal and the turtles are so valuable, the shops won't show the turtles to strangers.

Golden coin turtles were originally very abundant on the island of Hainan (Schmidt 1927; Gressitt 1940). Gressitt noted that these turtles are "transported in numbers to the United States for food for the Chinese people living there". This observation was echoed almost 50 years later by Zhao (1998), "For long periods of time they were caught in great numbers, many tons per year, for export to Hong Kong and other regions of southeastern Asia".

Prior to 1980, the Chinese communist policy restricted the work that each family could do. Individuals were not allowed to use any spare time for other profitable ventures. Those who did were denounced as capitalists.

After 1980, as part of the economic reforms, farmers could own or rent their own land and were free to spend their time as they pleased. Given the choice, they chose more lucrative endeavors. At that time golden coin turtles were very cheap (~0.25 USD/kg), but also much more abundant than now. People began to trade turtles. More and more people found profit in the turtle trade. They hunted for turtles every night with flashlights. Later, some people simply burned the mountainside during the daytime and caught the turtles at night when high temperatures forced the turtles to seek water.

At that time, 1 person could catch 5–6 golden coin turtles in 1 day and sell them for 16 Yuan (\$2 USD) per kg. But now the population density has decreased sharply. The number caught by hunters from several villages in a year is probably less than what 1 man could have caught in 1 day 20 years ago.

Now, it is believed that golden coin turtles are almost extinct in the wild. According to local villagers in south China, it is very difficult to collect any in the wild (Lau and Shi 2000). The day is fast approaching when the only place to see a Chinese three-striped box turtle will be an aquarium or zoo (Collins 1998). Certainly, the fate of *C. trifasciata* is tragic, but there are still many places with suitable habitat left in the wild (de Bruin and Artnier 1999; Lau and Shi 2000). Consequently, I think there is still hope for us to rescue the species in its natural environment.

### Why are Golden Coin Turtles so Valuable?

Not only are golden coin turtles eaten and kept as pets, but more importantly they are believed to have therapeutic significance in traditional medicine (Zhao 1998; Zhang et al. 1998). Their supposed benefits include high nutrition and healing properties, particularly curing cancer and other challenging illnesses. Because of these properties they are often given as expensive gifts with wishes of luck and longevity to friends and relatives (Zhou and Zhou 1992).

A shopkeeper in Zhongping told us, "Every year, before the Chinese Traditional Spring Festival, many people come into mountainous areas from the city to collect turtles as

gifts for their bosses and relatives". A landlady in Qionghai city added, "If you want to buy a golden coin turtle, you can get it from a judge in Haikou, where many families keep turtles that were given as payment for lawsuits. Golden coin turtles can bring wealth and happiness. It is a very good gift even though it is very expensive".

Does the golden coin turtle have any true medicinal properties? This is a very important academic and conservation issue. The high price offered has provided enough incentive for some poor farmers to turn into full-time turtle collectors. Many other species suffer as by-catch of the intense hunting efforts focused on this one species. Quick investigation into the true properties of *C. trifasciata* and then dissemination of this information to the general Chinese public is long overdue.

### Can We Still Save *C. trifasciata* in the Wild?

#### Enhanced enforcement

In March of 2002, we surveyed the turtle trade along three main highways on Hainan Island and found 72 wildlife purchasing stations. Although some of the purchasing stations were secretive, many were open to inspection. This indicates that local enforcement is not very active or effective. We were told that if the turtles were not so valuable and so easy to sell openly, it would be impractical for them to spend so much time and energy searching for them. Thus, I feel that if we can increase enforcement we can limit the trade in *C. trifasciata*.

#### In situ conservation as the focus of conservation efforts

Since the conservation of natural populations is very difficult, many people have put their hope and energy into captive breeding. However, to date there has been little discussion about the real possibility of harmful genetic inbreeding and disease transmission in captive populations (Lau 2002). Maintaining population diversity through this method will be problematic (Timmins and Khounboline 1999). The best way to protect a species is in its natural environment. I believe we need efficient, community-based conservation.

In China, a great deal of attention has recently been devoted to the captive breeding of endangered species as a kind of ex situ conservation. The golden coin turtle is one of many successful examples of commercial breeding of endangered species. There is a danger that most future conservation efforts will be directed toward captive breeding and not on protecting wild population and habitats (Lau 2002).

#### Enhanced research

It is inconceivable that we understand so little about such a famous species. Most of the data in the literature, such as incubation times, habitat, environment, etc. (see Ernst and Barbour 1989; Zhao 1998; Timmins and Khounboline 1999) stems from Schmidt (1927) and Pope (1935). Subsequent research is seriously lacking. Without this basic information, it is difficult to formulate protection grades in law and effective conservation measures.

## Concluding Remarks

I feel regret, agony, and contradiction for this wild-caught *C. trifasciata*. My biggest regret is that I cannot rescue her. I had hoped that Mrs. Chen could buy and raise her. That way I could make sure she was safe. Ideally, she could have played an important role in my academic research. My agony is that I can visualize her tragic fate. I once saw two *Pyxidea mouhotii* killed for soup. Their head and limbs pulled in tightly when they were sliced open and put into boiling water still alive. The contradiction I felt was because the dealer is my student's older brother and a friend. He gave me access to this information because he trusts me. I was in a dilemma between informing against him to rescue that turtle and being faithful to my friend. And I still wonder how we can resolve these issues.

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## Linnaeus Fund Research Report: Sequencing of the Mitochondrial DNA Control Region in the River Cooter (*Pseudemys concinna*)

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Although one of the most common freshwater turtles in the southeastern United States, the river cooter (*Pseudemys concinna*) has rarely been used in scientific studies. Its relative, the painted turtle (*Chrysemys picta*), on the other hand frequently has been subject to genetic analyses of paternity and phylogeography (Pearse et al. 2001a, 2001b; Starkey et al. 2003). River cooters can provide excellent subjects as they are relatively sedentary compared to some other spe-

cies, are large enough to be monitored visually and provide greater quantities of tissue for analysis, and inhabit most freshwater environments, enabling the species to be used for comparison with many other turtle species (Mount 1996). Their availability and wide range seem to make them ideally suited for many comparative studies. The key reason why river cooters have been overlooked as study animals is most likely due to the unavailability of genetic