

TITLE: Turtles Without Passports: Red-eared Sliders come to China

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Remember little Myrtle, your five-and-dime store pet of the 50's? China has simultaneously transformed him into a multimillion-dollar food product and a growing ecological disaster.

Long before the making of fireworks, paper, Great Walls, or microwave servings of Moo Shu Shrimp the people of China had an ongoing fascination with turtles. It went well beyond the turtles' role as a convenient food source. While the rest of the world recognized turtles as creatures easy to capture, transport, and store prior to modern day refrigeration, the Chinese used turtles not just for food but for traditional medicines, and cultural icons. They were symbolic of long life, personal wealth, fertility, strength, and happy households. In ancient China people from the Emperor down all worshiped the turtle. Their likenesses appeared commonly in artistic images, and turtles were often the subjects of stories and myths. They were mascots of Emperors, pets of Gods, and helped the people through times of disasters. Through the ages turtles were regarded as mysterious and at times as prophets.

Somewhat ironically the Ancient Chinese also used turtles as a resource. Prior to the development of paper, writings were inscribed on their shells and shells were used in fortune telling. Turtles, as well as their shells and eggs were sources of food, and were widely used in traditional medicine. In the Ming Dynasty (A.D. 1368-1644) the well known pharmacologist, Li Shizhen, reported that turtle helps repair internal injury caused by overstrain, strengthens the yin and yang and replenishes vital essence, reduces fever, calms the liver and subdues tang, softens and resolves hard masses. Even in modern times the belief continues that some species of turtles have curing properties for cancer and other difficult to cure diseases (Li et al. 2000).

In 1271, a relatively recent time in the overall history of China, the Mongols invaded and occupied the region. As a result Chinese culture experienced a tremendous change. The nomadic Mongols were not infatuated with turtles. Under the Mongol rule, because of their effort to totally destroy the region's culture, the turtle's symbolic image was changed to one of negative context. Since the time of the Yuan Dynasty, turtles were regarded as icons of the dirty, the timid, and of betrayal. To call someone a turtle is considered to be a great insult. If someone's wife is having an affair her husband is labeled a turtle. Referring to a person as a turtle egg has a negative connotation that rivals any of our best English language profanity. A turtle

man;Ç is a pimp or a brothel owner.

Because of this culture shift most modern day most Chinese people no longer regards turtles as an important icon -- certainly no longer a positive one. While turtles endure as symbolic of longevity, and a few strongholds of ancient Chinese culture remain, the turtles' place in the overall scheme of things today is mostly economic. Yet, the current demand is clearly rooted in ancient culture that promoted the special qualities of hard-shelled turtles. They are sold primarily as food, but are also marketed as pets, and turtles continue to be used in Chinese medicine. The bridge between economic exploitation and any regard for the turtle's ancient symbolic reverence has yet to be rebuilt.

The decline of wild stocks of native turtles in SE Asia, and in China in particular, is well documented (i.e., van Dijk et al. 2000) with suggestions that as many as 75% of the region's species are threatened with extinction and a number of species are already extinct in the wild. The decline has been rapid as markets and values have increased as a result of China's growing economy. This is in part due to the United States' free trade agreements established during the Nixon administration in the 1970's, and China's economic reforms of the 1980's. This economic growth lead to increased exploitation and resulted in a growing decline in wild stocks of the turtles themselves. The traditions of eating turtles continues with the increased demand fueled by the growing portion of the population now able to afford turtles as food, pets and traditional medicine. The decline of wild turtle populations has been further exacerbated by development and deforestation. For rare species such as the three-lined box turtle (*Coura trifascita*), for example, their market value increased 600-fold just since 1985. As a result businesses in China have been legally and illegally importing turtles from other countries for a number of decades. The growing demand, increased value, and limited and dwindling resource ultimately resulted in the need for turtle farming, not just of native turtles, but of North American species as well. Common snapping turtles (*Chelydra serpentina*), various species of softshell turtles (*Apalone*), and red-eared sliders were imported in large numbers for food and later as start up stock for Chinese turtle farming operations.

Information obtained for this article came from a combination of newspaper accounts, newsletters, grey literature reports and peer reviewed publications (in part listed under Literature Cited). This information was supplemented with Laio;Ç's visits to Chinese turtle farms and markets, as well as visits to natural and man-made aquatic habitats where turtles have been introduced. For some aspects of our text comprehensive published accounts are all but lacking. Figures gleaned from Chinese newspapers, magazines and websites are incomplete at best, and not always in agreement. People working for the turtle farm industry prohibited us from using their names or our referencing their in-house business based publications. Currency conversions were calculated at USD(\$):CNY=1:6.6. The EUR:CNY=1:8.9. What follows is pieced together from a wide variety of sources we believe to be accurate.

Red-eared sliders come to China:

They're everywhere, they're everywhere!!

In addition to turtles shipped in for direct sale in food markets, in the 1980's China began to import North American turtles in mass in order to establish turtle farms. In the early period of China's growing demand for turtles red-eared sliders (*Trachemys scripta elegans*) were not held in high regard for food or use in traditional medicine, and even today they are not regarded as highly as native hard-shelled species. Because of the rapid increase in the country's consumption of turtles, and dwindling supply this bias was overshadowed by demand. Few of China's native species do as well as red-eared sliders in commercial farming operations. Red-eared sliders could be obtained inexpensively from the turtle farming operations in the southeastern United States, and as these turtles were hardy, easy to raise, and grew quickly, they became one of the focal species for importation and use in the development of a number of turtle farms. The turtles are bred for use as both as food and pets. Farmed two-year old sliders can achieve weights exceeding one kg. Turtles marketed as food sell for CNY 9-15 per 500 grams (\$1.36-2.27 US). Hatchlings sold as pets go for CNY 3-5 (45 to 75 cents US).

Unlike many areas of the world where they eventually became regarded as injurious exotic wildlife, red-eared sliders were not imported in any number into China prior to the 1980's. In hindsight it is easy to explain the speed and the magnitude at which problems have developed. The reason why red-eared sliders have become a major exotic animal issue and are threatening aquatic systems at an alarming rate is simply in the numbers. In addition to being an ecologically tolerant generalists and a hearty species, these turtles have both been imported into and bred in China in astronomical numbers. They have become naturalized in the wild in three primary ways 1) release of unwanted pet, 2) escape from turtle farms (mostly resulting from floods), and 3) constant release of these turtles by Buddhist as part of their religious culture.

Economic and Cultural use of Red-eared sliders:

Use as food: A significant portion of the Chinese populous commonly consumes turtles and other wildlife (Yao and Cheng 2007). The Guangdong Forestry Bureau conducted a survey where they documented that more than half the people in the city of Guangzhou eat wildlife on a regular basis. Their survey documented that 45.4% believe that wild animals are more nutrient rich than domestic food products, 37% tried it out of curiosity, and 12% said it was to demonstrate their wealth and status. In addition to the general public a large portion of government officials ate wildlife because it was a status symbol (Guangdong wildlife smuggling investigation, Southern Weekend 2007). While the less fortunate are unable to afford expensive wildlife, including the more rare species of turtles, they are able to substitute less costly creatures such as red-eared sliders.

There are many people in China that do not eat turtles, in fact most don't; just as most Chinese don't eat dogs. If everyone ate turtles the consumption

rate would be 10 times higher than it is today. But because many Chinese people believe that eating turtles is important for maintaining health and fitness they are prepared in soups, and often the soup is supplemented with traditional medicines. This tradition goes back at least one thousand years. Previously people caught or purchased wild stocks or locally grown native species. Due to the growing demand, improving economy, and decline of most native species, China first began to import large numbers of turtles from neighboring countries to the south (van Dijk et al. 2000). As demand continued to increase, turtle farming became an important component for the supply of market turtles. During the time the farms were developing, continuing demand lead to importation of turtles from other regions, including the United States. A number of North American species were farmed; the most common ones being snapping turtles (*Chelydra serpentina*), Florida softshells (*Apalone ferox*), and red-eared sliders. They grow fast, reproduce readily, and can be farmed at a relatively low cost. Sliders quickly became one of the country's major farmed species.

Turtle is particularly favored in Guangdong province and accordingly it has the largest number of active turtle farms. Guangxi province, the city of Wuhan and areas surrounding Shanghai are also places where turtle consumption is high. Today more than four to five hundred million softshell turtles and sixty million hard-shelled turtles are consumed annually. Fifty million of these are red-eared sliders (Wang and Yang 2009). It interesting to note that red-eared sliders are also imported in huge numbers from southeastern US turtle farms into the Asian food markets in California and as a result have become an invasive nuisance (Maclachlan 2011).

Traditional medicine: Red-eared sliders are not considered species useful in traditional medicine because they are not native and are so inexpensive as to be believed inferior. However, unscrupulous businessmen market their parts as substitutes for those of native hard-shelled turtles as the more desirable native species demand a good price and are difficult to obtain. It is impossible to document to what extent this is done, but it is obvious that the practice is common. It is interesting to note that Hong et al. (2008) tested the nutritional benefits claimed by the practitioners of traditional Chinese medicine. They found that other animal products had similar properties and that the turtles had no specific attributes that would justify their mass exploitation and threats to the survival of the native fauna. In China's newspapers and other media outlets as well as scientists and nutritionists have repeatedly pointed out that wild animals have no additional food or medical value when compared to chicken, beef or pork. Many people do not believe this as government officials and the wealthy continue to eat wildlife, and prefer the rarest species. They also believe that wild turtles are superior to farm raised ones in terms of nutrition and medical value.

Use as pets: Turtles are widely sold as pets throughout China. Because they are regarded as more hardy and are less expensive than other species hatchling and young red-eared sliders have become the turtle of choice in pet markets. This is particularly true for first time buyers as information on the care of freshwater turtles as household pets is generally lacking and most people are

reluctant to try one of the more expensive types. The retail cost of a single 30-50 mm slider is about CNY 3-5 (45-75 cents US). [U.S. prices for hatchlings are currently about 45 cents wholesale and \$10-15 retail]

As in the US, Chinese buyers are not usually aware that these turtles can live a long time and quickly outgrow their containers. The burden of daily changes of smelly water results in a declining interest, and the purchase of containers with increased capacity and filters does not seem practical for such an inexpensive pet. People who are successful in keeping the sliders alive of any period of time often up-grade to more expensive and difficult to maintain species. This includes farm-raised native and various imported species. At such times the sliders are given to friends or more often released into the wild. Death of a pet turtle is considered to bring bad luck, so sick sliders are often released prior to dieing.

Cultural and Religious use: Contributing greatly to the establishment of red-eared sliders throughout China is a cultural/religious history going back at least 2,000 years. Buddhists believe that releasing animals back into the wild is a means of achieving blessing, and turtles and tortoises are considered as the most karmaically valuable animals to release. Because of this they commonly release store purchased birds, fish, turtles and other creatures. As a direct result of the availability and low cost of farm bread red-eared sliders, they have become a species of choice for release. Due to a lack of even a basic understanding of the need of turtles the creatures are not necessarily released into appropriate habitats. Tortoises often end up in rivers, and various turtles end up in the sea. Releases in the dead of winter are common. The people are not particularly concerned with the survival of the animal; to receive blessings they simply buy and release them. This same practice also occurs in the US and Canada with goldfish and hatchling sliders being the most common subjects for release (see Maclachlan 2011).

At other times Buddhist will purchase and release sliders when family members are sick, believing that will help with the healing process. Releases may occur daily until the person is fully recovered. This practice is feasible because of the low cost of the turtles. Twenty young sliders can be purchased for the US equivalent of \$15 (CNY 100). Their releases are not limited to hatchlings, often adult and sub adult sliders are released en mass. Sometimes Buddhists will carve messages into the shells of turtles prior to release. At times turtle collectors will follow Buddhist to their sites of release and capture many of the released turtles as soon as the ceremony is complete.

Turtle farms and the magnitude of commercial development:

Large-scale turtle farms originating in Guangxi, Guangdong and Hainan Provinces in the 1980's were almost exclusively ones raising Chinese softshells (Shi et al. 2004) and the number of freshwater turtle farms continued to subsequently increase. As the softshell market became saturated the operations turned to other species, particularly hard-shelled ones (Shi and Parham 2001, Chen et al 2000). The market went in two directions -- the more valuable native species

and inexpensive imports such as red-eared sliders. At first the sliders were simply purchased from the US as hatchlings and raised to a marketable size, by 2003 the farms started their own massive breeding programs for the sliders. At first the quantities produced were small as there were relatively few adult sliders in the country, but production increased rapidly. Today the numbers of sliders produced are impressive. By 2010 Chinese turtle farms in five provinces produce as many as 50 million red-eared sliders in a single year (Wang and Yang 2009), this was up from 20 million in 2005 (Wu and Zeng 2007). Red-eared sliders accounted for 1/3 of the turtles produced in Hainan Province (Li 2008). In addition to the farms;Ç annual output several million red-eared sliders continue to be imported from the US each year, this is down from 6-8 million imports in 2005 (Wu and Zeng 2007).

From the perspective of US turtle farms China's shift from import to farming of red-eared sliders had a considerable economic impact. In Louisiana alone there were over 80 turtle farms, by 2010 only 48 were still in business and this number probably continues to decline. China began purchasing fewer turtles each year as they built up their breeding stock. In fact they are probably competing with US farms exporting pet turtles to various countries lacking appropriate import regulations. Many US turtle farmers took out loans based on the boom in the 1980's to early 1990's when the Chinese were purchasing hatchlings for over one dollar (US) each. As the price dropped (its currently about 20 cents) and the demand decreased many of the newer farms went out of business leaving only the older established farms that had dependable markets in other countries.

In China turtle farms are primarily for food production. The major species currently farmed, in order of importance, are Chinese softshells (*Pelodiscus sinensis*), striped-necked turtles (*Mauremys sinensis*), red-eared sliders, Reeves turtles (*Mauremys reevesii*), and yellow pond turtles (*Mauremys mutica*) (Shi et al 2007, 2008). Subsequently, red-eared sliders have moved into the number two position. Because of their low cost the most commonly consumed species today are the farmed Chinese softshells, red-eared sliders, and Reeves turtles.

The number of commercial turtle farms in China is phenomenal. Shi et al. (2007) state the number of farms to be 1,000 with a stated value exceeding 1 billion US dollars. By the time of publication these authors recognized that their 2002 survey greatly underestimated the magnitude of the country;Çs farming effort. We suggest the actual number could be as high as 120,000-150,000 individual farms. Shi et al (2008) recognized and addressed the conservative nature of their assessment and the discrepancy in their figures and ours results in part from the lower number representing officially recognized farms; the larger total number reflects the undocumented farming operations that fall under the radar of the country's tax office. We can supplement the survey of Shi et al (2008) with information extrapolated here from a number of independent sources: Guangxi Province, more than 100,000 turtle farms (Animal/Fisheries and Veterinary Bureau of Guangxi, Liang Yuxiang 2010), 400 in Hainan Province with 270 hectares of farm ponds (Association of Turtles of Hainan Province, Li Jia

2008), 2,000-5,000 farms in Guangdong Province with an annual output of 30,000 tons and a farm area of 4,000 hectares (Association of Turtle Farms in Guangdong Province, and Liu 2008), 10,000 farms in Zhejiang Province (Turtle Association of Zhejiang), 1,000 farms in Hubei Province (Ezhou City Fisheries Bureau 2008), additional turtle farms occur in Hunan and Jiangsu Provinces and still others in northern regions. These numbers do not include small backyard farming operations. The farms are particularly numerous in Guangxi Province where the local government has supported the development of small turtle farms for poor farmers and a large unemployed urban population. Small loans and technical support are provided. Other provincial governments are likewise promoting turtle farms as evidenced by a 2007 publication of the Fisheries Bureau of Hubei Province titled 'Make Hubei turtles and soft-shelled turtles climb to nationwide.'

Economics and the future of red-eared sliders in turtle farms:

Hainan has the warmest climate for turtle farms and accordingly they have the earliest hatch and get the highest market price (CNY 2.7) for pet market turtles (Li 2008). This is followed by hatching several months later in Jiangsu and Zhejiang Provinces and market prices begin to decline. They reach their lowest value by fall (CNY 1.2-1.5).

The cost of domestic breeding is considerably less than importation of US bred stock and with the growing number of farms the retail value of hatchling red-eared sliders continues to decrease. The value was at its highest point in 2003 (CNY 11-12; \$1.75 US) and has declined steadily ever since (CNY 5-6 2004, CNY 3-4 2005, CNY 2-3 2006) and by 2010 reached the low point of (CNY 1.2; 18 cents US). The profit margins have become very thin and are predicted to fall further. In less than a decade their value has become reduced to that of hatchling Chinese softshell hatchlings a market that was saturated in the previous decade. Liu (2008) reviews the changing situation in Guangdong Province. The price this year for hatchlings is projected to be CNY 1 (12 cents US). Due to low labor cost the current production cost for hatchlings is CNY 0.6 (7 cents US). Because of the rampant increase in the number of turtle farms, the increased number of sliders produced, and the total lack of regulation, the market is not expected to recover, and profits will be impossible without increased production. This is a business model that can only be predicted to eventually crash.

Conservation issues and other problems:

Introduction and establishment: Despite the fact that the importation and commercial breeding of red-eared sliders was conducted only on a small scale prior to the last two decades, this species is already established as feral populations in many parts of the country. Major areas with self-sustaining feral populations include the Xiangjian River in Hunan province, the Pearl River in Guangdong province, the Gusu River in Shanghai, West Lake in Zhejiang province, and sections of the Qiantang and Yangtze Rivers. The species is well established in Taiwan, within a period of 20 years they have become the most

common turtle. On mainland China farmers and hunters capture all turtles found in the wild, they are even hunted with nets and hooks and lines from waterways in the middle of major cities. This has not only resulted in the endangerment of China's native species but to some degree harvesting pressure has partly controlled the establishment of the introduced sliders. In contrast, turtles in Taiwan are not regularly harvested from the wild and the red-ear slider populations have expanded rapidly.

Taiwan dealers import red-eared sliders every year; these imports are mainly for pets and Buddhism religious release ceremonies. The number of imports has escalated from 150,000 individuals in 1997 to more than 30,000 kg of hatchlings in 2003 (Chen 2008); this represents several million turtles. In 2010 it was estimated that the feral red-eared slider population in Taiwan was about 6 million individuals. Taiwan's Keelung River is occupied throughout by introduced sliders and native species have all but disappeared. In Taiwan large numbers can even be seen in living in fountain pools in public squares. The rapid build up here, vs. mainland China, results from the educated and affluent population's lack of interest in harvesting turtles from the wild. The absence of Government restrictions on both imports and farming of sliders suggest that similar population explosions of sliders will occur on mainland China as the country's economy continues to improve and the landscape becomes less rural.

Misuse, inhumane treatment of sliders: Often the business men running turtle farm operations and those overseeing sales in markets will use syringes to inject substantial amounts of water into turtles' body cavities. This is done to increase the weight of individual turtles and up the turtles' cost. This practice is conducted primarily with red-eared sliders and a few of the other less expensive species.

The Chinese people regard the number 8 as an auspicious number and private individuals and those marketing turtles will sometimes wire the shell on small turtles. Over time as the shell grows the forced constriction will cause the shell to form a figure 8. Due to their hardness this works on red-eared sliders but on most other species the turtles die long before they grow enough to radically deform their shells. Because of the inexpensive nature of sliders mortality is acceptable and is more than compensated by the sale price of the ones that survive. Customers will choose the deformed turtles because 8 is their favorite number, or in some case just because the shell shape is unique. There is little concern for the welfare of the individual turtle.

There are other novel uses of small red-eared sliders. People drill holes in the shell marginals, run a wire through the hole and use the live turtles as key chains. Some individual turtles have been reported to serve their sentence as living chains for over a year. As was the fad in the 1950's in the United States, hatchling turtles are often marketed with decorated shells, typically with words or designs painted on the carapace. It is well established that such treatment will result in deformed shell growth.

Hormones, steroids and antibiotics:

For turtle farms where animals are raised and sold by weight, rapid growth is essential. For the mass produced, less expensive species, Chinese softshells, red-eared sliders, and Reeves turtles, hormones, steroids and other drugs are added to their food in order to promote rapid growth. The residues of these drugs are retained within marketed turtles. This practice is not limited to turtles, farm-raised fish, chickens and other food market animals likewise receive heavy doses of hormones either through feeding or injection. Due to heating of rearing ponds, high-density culture techniques, and stagnant conditions of the ponds, disease is rampant in farmed turtles. This is countered by the use of antibiotics.

These practices are well known and widely reported in the press; nevertheless the consumer has little choice in that most available and affordable meat products are saturated with hormones and antibiotics. As a result, in recent years large numbers of Chinese children are experiencing early puberty. There are also news reports of mammary hyperplasia -- the breasts of men enlarge as a result of excess estrogen in turtle meat. The regular consumption of antibiotic residues will result in their accumulation in humans and result in lesions in various organs.

Conservation issues:

The IUCN lists red-eared sliders among the 100 most dangerous invasive species in the world, and since the 1970s the U.S. Food and Drug Administration has banned sales of pet turtles under four inches because of health risk to people. This ruling was based on health issues caused by the slider pet trade within the U.S. Several states in the U.S. have banned the sales and/or possession of red-eared sliders because they are regarded as injurious wildlife. Vietnam forbids their importation, as does the European Union (Lee 2010). The levels of establishment vary widely throughout China because of locations of farms and markets, and regional cultural differences. Many first, second and third order streams have been converted for agricultural use, and rivers dammed for hydroelectric power. This degradation is at the expense of native turtles and in many cases favors the exotic sliders. In that this species has been commercially prevalent in China for only about 20 years it is a reasonable assumption that introduced sliders will further saturate the country's aquatic systems over time.

The following issues represent our major concerns that will likely to be caused by red-eared slider introduction:

1. Options of sites to reintroduce native species in future will be limited by the established and growing populations of exotic sliders. As recently as 20 years ago feral sliders were all but absent from China.
2. The sliders compete with native species. Just 20 years ago Chinese stripe-necked turtles (*Mauremys sinensis*) were the most abundant species in Taiwan. Their numbers are in decline and now red-eared sliders are the common

turtle of Taiwan. And this on an island where commercial collecting of native turtles was not a major issue.

3. The omnivorous sliders will prey on native aquatic invertebrates and vertebrates, some of which are already facing numerous problems and accordingly are already in decline.

4. The increased presence of feral red-eared sliders on mainland China will result in the continued hunting of turtles for markets. Thus, even when native species are no longer present in quantities to make hunting them worthwhile, people will still be checking aquatic habitats for turtles, and any relict populations of native species will remain under commercial pressure. Considering the higher retail value of native stocks it is unlikely that they will be spared due to the abundance of sliders.

5. Likewise the presence of large numbers of red-eared sliders will subsidize and there by likely increase the number of native and feral predators, and most importantly nest predators, making it difficult for native turtles to reestablish populations.

6. Because of the deplorable conditions under which sliders and other farmed turtles are maintained spread of disease to wild stocks seems inevitable. Mass escape from turtle farms can occur during floods and other disasters, and individual pet turtles are continually being released.

7. The use of antibiotics in farmed turtles will lead to rapid evolution of bacteria creating resistant strains in both captive and, in turn, wild stocks.

8. The abundance of red-eared sliders and the increase in their production on turtle farms in China will lead to their export to other Asian countries that also have populations of rare and declining turtles. The turtles in these countries will also face competition from the feral sliders once they become established.

9. The ecological tolerance of *Trachemys* is such that they can survive in almost any situation and they can thrive in highly polluted waters and altered aquatic systems. This will make it almost impossible to eradicate them as individuals from polluted sources can easily re-colonize adjacent water bodies if restoration efforts are made.

10. Large turtle farms are constantly promoting the value of turtle nutrition in the media in order to enhance the marketing of their product. This increases the demand of not just farmed stocks, but for turtles taken from the wild as well. Recently the Association of Qinzhou Turtle Farms prepared a large pot of soup using 60 turtles in an advertisement ploy. Because the turtles used included rare and endangered species they pointed out they this single pot of soup was valued at CYN 180,000 (US \$ 27,272). While clearly outside the economic reach of the intended audience, this did stimulate the desire for turtle soup and resulted in an increased local demand for red-eared sliders and

other inexpensive turtles.

Chinese newspapers and websites have numerous articles explaining the ecological devastation to aquatic systems resulting from the release and establishment of red-eared sliders. The articles explain the turtles are "dangerous," "invasive species," and "killer" animals polluting aquatic habitats and disrupting the country's ecology. People are repeatedly warned not to release these turtles into the wild, but as in the U.S. the vast majority of the populace remains unaware of the issues, and refuse to believe that their little pet is capable of causing ecological havoc. If this not alarming enough Florida softshells and common snappers are now becoming popular in China's pet trade and it seems inevitable that they too will eventually become established throughout the country. This will give any surviving indigenous turtles three highly adaptable species against which they will need to compete.

Discussion: Because of China's diverse chelonian fauna, many being endemic species, the farming, mass production, and establishment of red-eared sliders in China presents a number of problems. While this same turtle has become established as feral populations throughout many areas of the world, the conservation issues are particularly troublesome in China. This is because of the combination of decline of native species, the heartiness and fecundity of the sliders, and the country's cultural use of turtles perpetuating an economic force driving the mass production of the exotic sliders. China's new path of capitalistic investment has led to the expansion of private turtle farms. At first turtle farming appears to be a strategy that would take the pressures off wild stocks. This seems intuitively true when common imported species such as red-eared sliders are farmed in mass, but this is not the case. Several recent publications have documented the continued drain turtle farms place on wild populations as the adult turtles reproductive output declines and the turtles are replaced with fresh stocks (Shi et al. 2007, 2008, Vinke and Vinke 2010). We suspect this is a direct result of poor nutrition. In the US most turtle farms are feeding their breeding stocks exclusively on inexpensive byproduct foods such as catfish heads or chicken entrails which eventually leads to reproductive failure as the breeding stocks are constantly being replaced with fresh wild caught turtles. This appears to be the case in China as well, as the farms interested in the more profitable stocks continue to devastate the few surviving native populations, while the inexpensive sliders help to perpetuate the market.

Chinese attitudes toward conservation vs. profit, combined with the country's growing population negates any serious interest in attempted ecological sustainability. The growing number of turtle farms actually masked turtle conservation concerns as people assume the farming of mass numbers of red-eared sliders and other common nonnative turtles would help eliminate the demand placed on wild native stocks (Shi et al. 2007). It appears that it has only expanded the demand. The conservation issues created, and problems resulting from the inhumane treatment of turtles continues to grow due to a near lack of government regulations (Meng et al. 2000) and engrained cultural attitudes.

Unlike in the United States where conservation and economic concerns occupy totally different strata of human concern, strata which have no interaction except when one annoyingly gets in the way of the other, in China the economic interest are the only driving force and conservation ethics are virtually nonexistent. Economic considerations are not likely to change even in the distant future, keep in mind China's population is 1.3 billion. Both its population and economy continue to grow.

It's interesting that the United States bans certain chemicals, requires warning labels on various products, and attempts to prohibit the sale of hatchling red-eared sliders and other turtles produced on our turtle farms that are under four inches because of health concerns. Still they allow these same products to be exported by US firms to other countries. Based on the amount of federal aid money going to various nations we are obviously interested in the health and welfare of people throughout the world. Yet, this does not include concerns that interfere with US based business ventures such as southeastern US turtle farms. China has no regulations regarding invasive species and our slider exports continue.

The future of China's native freshwater turtles is at best bleak. The country's economic growth is frequently at the expense of natural environments. This combined with the expanding human population will continue to limit any hope of future reparation of indigenous turtles and other native wildlife. The addition of feral red-eared sliders to the country's aquatic habitats is but one more nail in the coffin for any opportunity to restore past fauna assemblages. If one were to plan a conspiracy against China's former diversity of native turtles they would be hard pressed to contrive something better than the serendipitous events that are currently occurring.

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