

Turtle Farming in China, with particular reference to US species

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Turtle Consumption in China

- Turtle has long been used as food and as medicine in China despite being a symbol of longevity
- Many turtles in trade are wild-caught individuals from China and other Asian countries
- Farm-bred turtles became available in good numbers in the last 20 years and the market share has increased substantially



Turtle Farming in China

- 16 provinces have turtle farms
- Difficult to get an accurate picture because many farms operate without proper license
- Shi *et al.* (2008) estimated over 300 million turtles are sold per year and are worth US \$ 750 million
- Zhou & Wang (2008) estimated 120 – 160 million turtles produced yearly and worth US\$ 200 million



Softshell Turtles Farming

- China started farming Chinese Softshell Turtles in 1970's
- In mid 1980's, adopted Green House farming technique from Japan
- In 1990's turtle farming expanded quickly throughout China
- Since 2000, Florida Softshell, Spiny Softshell and Smooth Softshell have also been farmed



2007 Softshell Turtles Production

Species	Breeding Stock	Yearly Production
<i>Pelodiscus sinensis</i>	2 - 2.5 million	110 – 120 million
<i>Palea steindachneri</i>	20,000 – 30,000	100,000 – 150,000
<i>Apalone ferox</i>	50,000 – 60,000	250,000
<i>Apalone spinifera</i> & <i>A. mutica</i>	10,000 – 20,000	30,000

Zhou & Wang, 2009; Zhou *et al.*, 2009

Hard-shelled Turtles Farming

- Started in mid 1990's with two main species, Reeves Terrapin and Red-eared Slider
- In late 1990's, price of Soft-shell Turtles dropped considerably, many farms switched to Hard-shelled Turtles
- More species are being farmed and the scale of operation also increases
- Ranged from big outdoor ponds for adaptable low-priced species to high-security indoor facilities for valuable species



2007 Hard-shelled Turtles Production

Species	Breeding Stock	Hatchlings per year
<i>Trachemys scripta elegans</i>	1 – 2 million	10 million
<i>Mauremys reevesii</i>	500,000 – 700,000	8 million
<i>Mauremys sinensis</i>	200,000 – 260,000	300,000 – 500,000
<i>Mauremys mutica</i>	40,000 – 50,000	230,000 – 260,000
<i>Chelydra serpentina</i>	22,000 – 50,000	20,000 – 30,000
<i>Cuora trifasciata</i>	10,000	5,500 – 8,000
<i>Cuora flavomarginata</i>	5,000 – 8,000	2,000 – 5,000

Zhou & Wang, 2009; Zhou *et al.*, 2009

Hard-shelled Turtles Farming

- 22 species are being bred in commercial scale
- Other US species bred (in moderate numbers) include: *Trachemys scripta scripta*, *Chrysemys picta bellii* and *Graptemys pseudogeographica kohnii*
- Young *Macrolemys temminckii* are imported and raised to marketable size in farms

Other US turtles being farmed (as of 2008)

- Bred successfully in small numbers:
Graptemys nigrinoda, *G. pseudogeographica pseudogeographica*, *G. versa*, *Pseudemys nelsoni*, *Chrysemys picta picta*, *Deirochelys reticularia*, *Malaclemys terrapin*, *Terrapene carolina triunguis*, *Sternotherus carinatus*, *S. odoratus*
- Being attempted: *Terrapene ornata ornata*, *Kinosternon subrubrum* etc.

Impacts of Turtle Farming

- Can flood the market and cause a big reduction in price of the concerned turtles
- Results in less pressure on wild population
- Only apply to common species with short life cycle and high reproductive potential, e.g. Chinese Softshell Turtles

Impacts of Turtle Farming

- For very rare and highly valuable species, e.g. Golden Coin Turtle, can cause a big jump in demand and the price actually shoots up (price of a hatchling went up from US\$ 10 in 1984 to over \$ 1000 now)
- The need for breeding stock, especially males, results in intensive collecting pressure to find the last turtles in the wild
- The presence of legal, farm-bred individuals makes enforcement extremely difficult



Linking Turtle Farming with Turtle Conservation

- Workable certification system, legislation and enforcement in place so that the trade in wild caught individuals can be controlled or stopped
- Part of the profit generated goes back into conserving turtles

Other Concerns

- Establishment of invasive exotic species
- Hybridization with native species or subspecies and causes genetic contamination



Trends

- The number of turtle farms, farmed turtle species and the turtle stock increase every year
- Some big farms now diversify their products, e.g. turtle wine and turtle essence and run tours

Worrying trend – growing pet trade may stimulate farming of endangered species

- Need turtles to build up stock
- Complicate enforcement





Thank you