

*Conservation and Trade Management of Freshwater  
and Terrestrial Turtles in the United States*

**Workshop Presentation Abstracts**

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# **Setting the Stage for Understanding Globalization of the Asian Turtle Trade: Global, Asian, and American Turtle Diversity, Richness, Endemism, and IUCN Red List Threat Levels**

**Anders G.J. Rhodin<sup>1</sup> and Peter Paul van Dijk<sup>2</sup>**

<sup>1</sup>*Chair, IUCN Tortoise and Freshwater Turtle Specialist Group,  
Director, Chelonian Research Foundation,*

*168 Goodrich St., Lunenburg, MA 01462 USA [rhodincrf@aol.com];*

<sup>2</sup>*Deputy Chair, IUCN Tortoise and Freshwater Turtle Specialist Group,  
Director, Tortoise and Freshwater Turtle Conservation Program, Conservation International,  
2011 Crystal Drive, Suite 500, Arlington, VA 22202 USA [p.vandijk@conservation.org]*

The diversity of turtles and tortoises in the world that have existed in modern times, and currently generally recognized as distinct, consists of 334 species, of which 58 are polytypic, with 127 additional recognized subspecies, or 461 total taxa of modern turtles and tortoises. Of these, 9 species and 1 subspecies, or 10 taxa, have become extinct since 1500 AD, leaving 325 species, 126 additional subspecies, and 451 extant turtle taxa.

Turtle species richness is highest in Southeast Asia, the northern Indian subcontinent, and the southeastern USA, with the latter representing a major Turtle Priority Area not included in current global conservation strategies such as biodiversity hotspots or wilderness areas. Turtle richness as based on number of taxa (species plus subspecies) per nation is highest in the world in the USA with 89 taxa, with Mexico, Australia, Brazil, Indonesia, and India rounding out the top 6 turtle richness nations. The states of Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas, if counted as individual nations, would all warrant ranks near the 5th spot on the global list, reflecting the remarkable diversity and richness of turtles in the southeastern USA. In terms of endemic species and subspecies, the USA ranks number 1 globally for actual number of endemics (60 taxa), and number 2 behind Australia for percentage of endemics (67%).

As of the 2010 IUCN Red List, of 207 turtle species officially listed, 129 (62%) are assessed as globally threatened (Critically Endangered, Endangered, or Vulnerable), with 70 (34%) endangered (Critically Endangered or Endangered). Based on a slightly different taxonomy assessed by the Turtle Taxonomy Working Group of the IUCN Tortoise and Freshwater Turtle Specialist Group, 134 species (40% of all 334 turtle species) are considered threatened, with another 10 provisionally assessed as threatened, yielding 43% of all turtles threatened. Turtles are among the most threatened of any major group of vertebrate species, nearly as high as primates (48%), and more than amphibians (30%), mammals (21%), or birds (13%). Based on additional draft Red List assessments and including Extinct in the Wild and Extinct species, 49% of all modern turtles are either extinct or threatened with extinction.

Of the 129 species of turtles listed as threatened on the IUCN Red List, 88 (68%) are at least partially threatened by exploitation and trade. There are 64 species of threatened tortoises and freshwater turtles from Asia (50% of all threatened species), of which 55 (90%) are at least partially threatened by exploitation and trade. There are 14 species of threatened tortoises and freshwater turtles from the USA (11% of all threatened species), of which 7 (50%) are at least partially threatened by exploitation and trade.

Total threat levels for turtle taxa per nation are the highest in China, with the Asian nations of Vietnam, Indonesia, Myanmar, Thailand, India, and Malaysia included in the global top 10, with the USA ranking number 10, though with a low average threat level per taxon. Threat levels for tortoises and freshwater turtles in the USA were reasonably low when last evaluated for the IUCN Red List in 1996, with only 14 threatened tortoise and freshwater turtle species, of which none were assessed as Critically Endangered, 4 Endangered, and 10 Vulnerable.

Provisional draft Red List assessments of 51 American tortoise and freshwater turtle species evaluated by the IUCN Tortoise and Freshwater Turtle Specialist Group in 2010 now result in a higher number of threatened species, partially due to more detailed knowledge of the taxonomy, status, and population trends of these species, but also because of increased exploitation in recent years. As currently provisionally drafted, the USA has 19 threatened species of tortoises and freshwater turtles, of which 3 qualify as Critically Endangered, 9 Endangered, and 7 Vulnerable, and of which 11 (58%) are at least partially threatened by exploitation and trade.

Three species are provisionally assessed as Critically Endangered: *Glyptemys muhlenbergii* (previously Endangered), *Sternotherus depressus* (previously Vulnerable), and *Graptemys gibbonsi* (previously Near Threatened). Nine species are provisionally assessed as Endangered: *Clemmys guttata*, *Emydoidea blandingii*, *Glyptemys insculpta*, *Graptemys caglei*, *Graptemys flavimaculata*, *Graptemys pearlensis*, *Pseudemys alabamensis*, *Gopherus agassizii*, and *Gopherus polyphemus*. Seven species are provisionally assessed as Vulnerable: *Macrochelys temminckii*, *Actinemys marmorata*, *Graptemys barbouri*, *Graptemys oculifera*, *Malaclemys terrapin*, *Terrapene carolina*, and *Trachemys gaigeae*. Seven species are provisionally assessed as Near Threatened: *Graptemys ernsti*, *Graptemys pulchra*, *Pseudemys gorzugi*, *Pseudemys rubriventris*, *Terrapene ornata*, *Trachemys stejnegeri*, and *Gopherus berlandieri*.

Five species are proposed to have moved from non-threatened to threatened status: *Emydoidea blandingii*, *Malaclemys terrapin*, *Terrapene carolina*, *Graptemys barbouri*, and *Graptemys gibbonsi*, with one newly described species, *Graptemys pearlensis*, also assessed as threatened. One species (*Kinosternon sonoriense*) has moved from threatened to non-threatened status, based on improved knowledge of its distribution. Of the 28 species of American tortoises and freshwater turtles included on the 1996 Red List and now re-assessed in 2010, 13 (46%) are now considered more threatened, 10 (36%) show no change in status, and 5 (18%) are now considered less threatened. Of the 19 species classified as Least Concern in 1996, 18 remain at that status and only one (*Graptemys pulchra*) has moved to Near Threatened.

Though deteriorating somewhat since 1996, the proposed IUCN Red List status of American turtles remains on average at much lower threat levels than for Asian species. However, as levels of exploitation and trade have increased steeply in several states in recent years—thereby increasingly affecting survival status and causing some of these states to regulate or curtail commercial take of turtles—it would possibly require broader enactment of proactive conservation measures to stabilize or reduce these national threat levels.

**Conservation and Trade Management of Freshwater and Terrestrial Turtle in the United States**

**The Application of the North American Model of Wildlife Conservation to Freshwater and Terrestrial Turtles**

**John F. Organ**

U.S. Fish and Wildlife Service

Abstract: The North American Model of Wildlife Conservation (Model) is a concept that articulates a set of principles that collectively form the underpinning of wildlife conservation in the United States and Canada. Seven principles have been described. An overview of the Model will be provided, and each principle will be described and assessed for its applicability to turtles and the extent to which they have been applied to turtles in the United States.

## **TURTLES IN LOUISIANA**

**Jeff Boundy**

Louisiana Department of Wildlife and Fisheries  
PO Box 98,000  
Baton Rouge LA 70898-9000

Abstract.—I present a summary of recent trends in Louisiana Turtle Farm operations, Louisiana turtle exports, use of turtles in Louisiana, and the results of recent surveys for various species of turtles in the State.

**Life history and demography of turtles of the United States**  
**Jeffrey E. Lovich**

Research Ecologist

U.S. Geological Survey, Southwest Biological Science Center  
2255 North Gemini Drive, MS-9393, Flagstaff, AZ 86001

[jeffrey\\_lovich@usgs.gov](mailto:jeffrey_lovich@usgs.gov)

The United States has a diverse turtle fauna with 57 native species, 22 genera and 7 families, or approximately 18% of the world's turtles. This high diversity is reflected in the fact that the southeastern United States is recognized as a "Turtle Priority Area" for conservation. Recent analysis shows exponential increases in our knowledge of U.S. turtles, as reflected in numbers of published citations. Some species are relatively well-known by this metric while many, including threatened species, are rather poorly-known. Conservation status does not greatly influence status of knowledge although body size and range size do. Almost 40% of U.S. turtle species are threatened, a figure that is not different from the worldwide proportion. Why are turtles such an imperiled group? Research suggests that the driving factors for worldwide reptile declines include 1) habitat loss and degradation, 2) introduced invasive species, 3) environmental pollution, 4) disease, 5) unsustainable use, and 6) global climate change. With respect to unsustainable use, the literature suggests that turtles possess a co-evolved suite of life history traits that constrain their ability to respond to exploitation including 1) low annual fecundity, 2) high nest mortality, 3) delayed maturity, 4) high adult (and post-nest emergence) survivorship, and 5) longevity. The paradigm for turtle population stability suggests that high adult survivorship is necessary to ensure persistence due to the possession of those life history traits, a strategy that has served them well for perhaps more than 200 million years. To assess our knowledge of life history traits in turtles of the United States I gleaned data from the most recent edition of *Turtles of the United States and Canada. Second Edition* (Ernst and Lovich, 2009. Johns Hopkins University Press. Baltimore. 827 pp). I included data on maximum carapace length; minimum length at maturity for females and males; minimum age of maturity for females; mean hatchling size; mean clutch size; maximum clutch frequency; adult, juvenile and hatchling survivorship; and measures of longevity. Complete data were available for few species (especially survivorship measures) and there was wide variation, often over an order of magnitude, in traits across species. For example, minimum ages at maturity for females ranged from 3 (red-eared slider) to 26 (green sea turtle) years and maximum body size ranges from the diminutive bog turtle (11.5 cm) to the enormous leatherback sea turtle (243.8 cm). For many turtles survivorship must increase rapidly after leaving the nest to compensate for high pre-emergence mortality. Across species life history traits show strong correlations with each other: in larger species females mature at a later age, hatchling size is larger in larger species, mean clutch size and frequency is greater in larger species (although the latter relationship does not account for interannual variation in reproduction), and clutch frequency decreases with adult survivorship. Preliminary analyses suggest weak correlations between female reproductive lifespan (and longevity) and all other traits. Later minimum age of female maturity does not necessarily mean greater longevity and longevity is not necessarily greater in larger species. Cluster analysis identified three groups of correlated traits: one related to longevity; one related to body size; and a third related to maturation, reproductive output, and hatchling survivorship. Principal components analysis identified two factors explaining over 82% of the variation in life

history traits. The first axis was related to maximum body size, female maturity size, and clutch size. The second axis was related to adult survivorship and longevity. Complete data were available for 14 species that formed three distinct clusters: one for sea turtles; one with Blanding's turtle, the desert tortoise and the gopher tortoise; and one for small emydids and other turtles. Published literature based on long-term studies of Blanding's turtle and the common snapping turtle support the sensitivity of population persistence to adult survival but not to age at maturity, nest survival or fecundity. A small number of turtle species appear to grow rapidly, mature early, and have high fecundity that allow density dependent responses to exploitation but these are in the minority based on available evidence. Exploitation has been documented to affect population size and structure of several turtle species. Due to the long time some species require to reach maturity there is a "perception of persistence" in some turtle populations that can last decades before population decline or extirpation is actually observed. This is in sharp contrast to many traditional game species. As noted by other researchers, turtles have the greatest development of iteroparity and the lowest intrinsic rates of increase of any large order of tetrapods. Indirect effects of turtle commercial exploitation include the spread of disease, the spread of invasive turtle species, genetic pollution, and potential ecological and demographic impacts that are poorly understood. Almost all turtle species that are now extinct, critically endangered or rare were once abundant and overharvest is the main cause. In addition, no species of freshwater turtle or tortoise listed under ESA in the United States has ever been recovered or de-listed. In conclusion, based on a review of the literature, the turtle life history paradigm is supported with very few exceptions: high adult survivorship is necessary to ensure the persistence of turtles with delayed maturity, continued reproductive output, high and variable nest success, and long life spans. Life history evolution of turtles is constrained by a conservative and rigid morphology essentially unchanged since the Triassic. Why would we expect them to change now?

## *Impacts of non-harvest anthropogenic activities on freshwater turtles in the United States*

### **Peter Paul van Dijk, Ph.D.**

Deputy Chair & Red List Focal Point, IUCN/SSC Tortoise & Freshwater Turtle Specialist Group  
Director, Tortoise and Freshwater Turtle Conservation Program  
Conservation International, President's Office  
2011 Crystal Drive, Suite 500, Arlington, VA 22202, USA  
email <[p.vandijk@conservation.org](mailto:p.vandijk@conservation.org)>, phone (+1) 703.341.2679, fax (+1) 703.979.2873

Many Freshwater Turtle populations and species are threatened to varying degrees by a wide variety of threats. This presentation aims to provide a summary introduction to the spectrum of general, habitat-wide and turtle-specific threats impacting turtles, and introduce the underlying biological factors determining why turtle populations are generally more intensively affected by population impacts than traditionally harvested and managed species, like deer, quail, fish and shellfish, are.

Habitat impact on freshwater turtles range from wetland drainage, structural alteration to riverine systems by dams and reservoirs as well as sandmining, the direct and indirect effects of water pollution (industrial, municipal and surface runoff), and deforestation and other impacts on the dry-land areas used by freshwater turtle species as part of their lifecycle. Invasive plant and animal species can alter critical habitat features to make an area less suitable for turtle populations to inhabit, but alternatively can also provide new or additional sources of food and shelter to turtles. The impact of habitat loss is easily explained as 'No suitable habitat, then no surviving turtle population'.

Impacts specific to freshwater turtles include human collection of turtles at various life stages and for a variety of purposes, including as pets and other recreational functions such as turtle racing, as well as subsistence consumption, domestic and export trade for consumption and medicinal purposes. Accidental mortality when turtles cross roads or reside in agricultural lands has been documented to be of great significance as road networks fragment remaining habitats and riparian buffer zones along rivers and wetlands are often much smaller than individual turtles' activity ranges. Accidental mortality rates of freshwater turtles in commercial, recreational or scientific fisheries activities are significant for certain species and localities, particularly for the Diamondback Terrapin in the Blue Crab fishery, but also wanton destruction of turtles which take fishermen's bait as perceived competitors or fish predators. The impact of introduced invasive species, or subsidized native species, on turtle populations is only partly documented, but ranges from increased, sometimes overwhelming, nest predation rates to increased mortality of adult turtles. Correspondingly, the possible introduction of non-native turtle species into US waters (such as the widely traded Chinese Softshell Turtle) and moving native species into different parts of the country (such as the release of traded pet turtles into local environments) carry the risk of introducing diseases, upsetting ecological balances, and genetic pollution of resident native turtle populations. Epidemic diseases hve not been documented conclusively in North American freshwater turtles, but the prevalence of Herpes-

and Ranavirus in Terrapene box turtles and the impact of disease on the Flattened Musk Turtle indicate that this is at least a potential threat.

Turtles as a group are characterized by life history attributes that include late maturity (generally at between 5 and 20 years of age), longevity and long-term annual reproduction, high mortality of eggs and small juveniles, and high annual survivorship of subadult and adult animals. In contrast to 'traditional' managed wildlife and fisheries species, where the effects of offtake levels and management measures become measurable within years, the time scale of turtle life history results in exploitation and recovery effort effects becoming apparent, and continuing to have effects, for decades after the events occur. This has obvious implications for long-term turtle population management, and documents why traditional management measures as commonly applied for game birds, fish or shellfish do not apply to turtles.

## **State of the Union: Existing Regulations for Native Herpetofauna, with Emphasis on Turtles**

**PRIYA NANJAPPA**; Association of Fish & Wildlife Agencies, 444 N. Capitol St. NW, Suite 725, Washington, D.C., 20001; [pnanjappa@fishwildlife.org](mailto:pnanjappa@fishwildlife.org); (202) 624 3643

Aside from habitat loss and alteration, one of the largest challenges to managing herpetofauna in the United States is the use of wild, native amphibians and reptiles, including turtles, for human food consumption, pets, and hobbyist captive breeding, among other uses. To begin to assess the current state of regulatory authority over the use of herpetofauna, The Association of Fish and Wildlife Agencies' Amphibian and Reptile Subcommittee, in partnership with the Law Enforcement Committee, collected laws and regulations from each state fish and wildlife agency and compiled into a draft report, *State of the Union: Legal Authority Over the Use of Native Amphibians and Reptiles in the United States*. An initial draft of this report served as a basis for discussion at a November 2009 Summit, "Applying the North American Model to Amphibians and Reptiles: Ensuring Sustainable Use," held in Atlanta, Georgia. Following the Summit, the State of the Union report was updated based on requests from the attendees. Findings from the final report, along with preliminary recommendations, will be presented with an emphasis on the regulatory approaches pertaining to turtles.

## **Cooperative Turtle Conservation: Highlighting Selected Efforts in the Southeastern U.S.**

**Presented by Erin Rivenbark.** 2010. Turtle conservation efforts in the Southeastern U.S. vary substantially in size and scope. Even the smaller efforts often involve multiple partners due to jurisdictions, authorities, impetus for the effort, and financial support. Here, we highlight a variety of selected efforts being carried out for both aquatic and terrestrial turtles in the Southeastern U.S. illustrating effective localized conservation, as well as, wide-ranging projects which are underway. Key factors in success of various projects appear to be dedicated funding, partnerships, presence of “champions” to carry them to completion, and presence of a conservation designation that may elevate the species in priority, highlight the need for conservation, or provide authorities to carry out the work.

**Special Agent Dan Burluson**  
U.S. Fish and Wildlife Service

Will discuss three commercial turtle harvest cases from Missouri. The presentation will cover state and federal laws violated, species targeted and the prosecution. Two of the cases are from south east Missouri and deal with commercial turtle harvesters taking turtles in restricted areas. The third case involves a man from south west Missouri who was selling Missouri protected species in the US and in international commerce.

## **OPERATION SHELLSHOCK**

**Richard Thomas**

New York Department of Environmental Conservation

Presentation Overview

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Biodiversity is the variety of all living things on earth. It is the life system that we as humans are part of. It is fundamental to our existence. Every living creature in each of the earth's recognized biomes contributes in some significant way to the ecological systems of our planet, our individual health, and to the quality of our lives. Some species, such as the Bald Eagle, are considered glamorous and symbolize our nation, our freedom, our sporting heritage, and our successes at wildlife management. Some, like our reptiles and amphibians, are less admired and often considered slimy, ugly and dangerous by the uninformed. However, more than all of our "signature" birds, fish and animals that we as a society cherish, our snakes, turtles, lizards, frogs and salamanders tell us the most about the health of our environment. These "indicator species" are sensitive to pollution and habitat change. They tell us, through disappearance, disease and deformities, when things are not right. They are the species most directly related to public health and safety. Many, like the Timber Rattlesnake, bring us close to wilderness, and wildness, with even just a brief encounter. Our reptiles and amphibians are often the open gate leading our youth down a lifetime path of nature exploration and stewardship. They are critically important. And, they are under attack.

During 2006 the New York State Department of Environmental Conservation's Division of Law Enforcement began to take a hard look at the illegal black market involving the State's native reptiles and amphibians. Reports of disappearing populations of protected turtles, frogs, salamanders, lizards and snakes, an awareness of the market effect on wildlife through the internet, and the ecological necessity to protect our indicator species, were all factors fueling our concern. New York State's reptiles and amphibians face habitat loss and fragmentation, disease, invasive species, pollution and threats brought on by global warming. The illegal collection and marketing of these animals often serves as the "nail in the coffin" for many populations as they try to survive. Armed that year with new legislation that now protects all of the State's "herpafauna", the Division began an aggressive pre-operational phase of research to determine if indeed there was a commercial threat to the wildlife species that tell us the most about the quality of our environment. What we found was alarming. A very lucrative illegal market did exist, fostered by a strong culture of enthusiasts, which amongst them exists an element with a desire to make money from ecologically significant species whose value grows on the black market as population numbers decline. Division investigators identified significant illegal buying and selling of native New York species on the internet, at large organized "herp" shows across the country, and through individuals' intent on owning native species for their personal collections.

Armed with a solid basis of fact, the Division assigned two investigators to full time covert status, with the intention to penetrate the illegal trade in reptiles and amphibians. The goal was to prosecute those involved, and bring about a renewed public awareness toward such a sensitive

resource and the laws that protect them. The Division asked for and received the discreet and full support from Commissioner Pete Grannis and a small number of biologists within the Department, all of whom remained silent to the cause while working hard to assist the investigators in their mission. The two covert operatives spent countless hours afield with the Department herpetologist learning the natural history of the animals found in the illegal market. They spent as much or more time researching on-line to become familiar with, and associate with internet buyers and sellers of wildlife.

Throughout 2007 and 2008, the undercover investigators slipped into the herp world and came back time and again with cases of a magnitude none would have guessed. They found New York's snakes and turtles being shipped out of state and out of the country to support high-end markets for illegal collectors in places like Pennsylvania, Florida and Europe. They found thousands of New York Snapping Turtles being laundered through a turtle farm in Louisiana, and then shipped to China. They found thousands more being trapped illegally in New York and sold in Maryland to be shipped internationally as meat. The Investigators spent hundreds of hours afield and at shows with reptile poachers and illegal collectors. They were patted down for body wires, accused of being "Feds", and routinely handled venomous snakes. They built cases from the ground up through initial contact with violators on-line, at shows, and in the field. They bought illegal Eastern Box Turtles, Wood Turtles, Blandings Turtles, Spotted Turtles, Timber Rattlesnakes, Massasauga rattlesnakes, Copperheads, and salamanders. Although Shellshock's intention was to address the illegal trade in our native species, the investigators did not pass up the opportunity to make a felony case against someone selling federally endangered Yellow Spotted Amazon River Turtles. With the authority of the Commissioner, and the help of other Investigators and Environmental Conservation Officers, they collected and incubated hundreds of turtle eggs to integrate into poaching circles. A felony case was made against a Florida company that offered species native to New York for "adoption", with prices in the hundreds of dollars per animal. And they successfully traded native venomous snakes with a smuggler from Canada and recovered an entire wild population of endangered Massasauga rattlesnakes.

The Investigators worked very closely with the PA Fish and Boat Commission, as that agency ran a sister initiative side by side with New York. They also worked closely with the United States Fish and Wildlife Service (USFWS), agencies in Ohio, New Jersey, Florida, Alabama, Louisiana and Maryland, Environment Canada, and the Ontario Ministry of Natural Resources.

The covert investigators working Operation Shellshock were not looking for those unaware of the laws. They sought out targets that had knowledge and intent to break the law to either personally possess a rare species or make money commercializing the resources. In fact, for each individual or company targeted by the investigators, there were many others that were discouraged from making an illegal sale and told they should read the law. Even covertly, the Department was working toward informing those that needed educating, and criminally pursuing those that knew exactly what they were doing. The culture of herp enthusiasts is literally hundreds of thousands of people with an intense interest in reptiles and amphibians, including their conservation. As with all special interest groups, the vast majority of the people involved are well intentioned. In fact, they are without a doubt an interest group keen on gaining knowledge and sharing expertise on the natural history, conservation and care of the animals they love.

By late 2008 the Division of Law Enforcement moved on the groundwork done by the covert investigators. Numerous search warrants were executed in December and by the following March, 18 individuals and companies had been charged with New York felonies and misdemeanors relating to the commercialization of wildlife. In addition, the USFWS served notice on two additional individuals for Lacey Act felonies relating to the illegal cross-border trade in wildlife. The PA Fish and Boat Commission charged several individuals, and Environment Canada and the Ontario Ministry of Natural Resources charged three individuals tied to the poaching and trade of endangered Massasauga Rattlesnakes. And, it isn't over. As of September 2010, more than 30 targets have been charged. A conviction rate of one hundred percent for the state and provincial cases has been achieved, with over \$100,000 recovered in fines and forfeitures. Two significant Federal cases are still in court, and investigations continue on leads developed from Shellshock.

In all, over 400 live turtles were kept in evidence, mostly under the care of the covert investigators. In addition, over 75 native venomous snakes were kept and cared for by a trained wildlife handler and educator working with the DEC. Ultimately, all the live evidence found a home through release back to the wild (after appropriate quarantine and evaluation), colleges and nature centers, zoos, and outdoor research facilities built by Department personnel to study individual species. DNA was actually used with the Ontario Massasaugas to insure their return to the right location.

Operation Shellshock is the largest, most successful undercover wildlife operation the Department of Environmental Conservation has ever completed. It will stand out among operations done elsewhere as well, for both its magnitude and meaningfulness. Shellshock has become a springboard for positive change on all fronts involving ecologically significant species and biodiversity awareness. New York will no longer be regarded as a State of unregulated trade in reptiles and amphibians. A strong message has been sent that species native to New York, both wild and captive bred, from within or without the State, cannot be bought and sold here, as it encourages exploitation of wild populations. The public is more aware of the role creatures like timber rattlesnakes and spotted turtles play in our health and existence. The Division of Law Enforcement, armed with more knowledge of natural history, internet savvy, and site specific patrol areas, has increased it's effectiveness to regularly find violators impacting the State's biodiversity. And, the protection of the habitat's needed to sustain reptiles and amphibians, such as our wetlands, vernal pools, grasslands, streams and lakes, have become even more important in the eyes of both our enforcement officers and our citizens.

### New York State's Native Reptile and Amphibian Laws An Overview

New York has protected a handful of reptile and amphibian species for many years. Species listed as threatened or endangered, such as the Timber Rattlesnake (threatened) and the Bog Turtle (endangered) are provided protection through specific legislation aimed at protecting the

most vulnerable species. Turtles such as the North American Wood Turtle and the Eastern Box Turtle have been protected since 1905 by listing them as a game species with no open season. However, species of special concern like the Spotted Turtle and the Marbled Salamander were listed as such, but with no legal regulation preventing collection. Snapping Turtles, long considered a nuisance animal but now recognized as an important component of a wetland environment and heavily studied for their ability to concentrate contaminants absorbed from their environments, have long been commercially harvested with no restrictions. Unfortunately little was known about the magnitude of the harvest of Snapping Turtles or any of the other unprotected species.

In 2006 the State of New York adopted legislation that gave all native frogs, turtles, snakes, lizards and salamanders legal protection as game species, with very few open to harvest. The law does not differentiate between wild caught and captive bred animals or animals possessed prior to enactment of the law. And the law applies to herps in “any life form” which includes eggs and larvae. There still remains a limited harvest for the Diamondback Terrapin, a native turtle of Long Island’s brackish waters. Common Snapping Turtles can still be taken in quantities that allow a controlled harvest without stimulating a commercial market. And there is a season for certain frog species in the summer months as well. DEC Regional Offices will issue a free permit to individuals who desire to possess a limited number of the more common species of herps but this permit does not allow buying, selling or breeding.

The section of New York’s Environmental Conservation Law that is a mainstay in the fight to protect the State’s wildlife is ECL section 11-0107 sub 2. It states:

No person shall, at any time of the year, buy, sell, offer or expose for sale, transport, or have in his possession any fish protected by law, game, protected wildlife, shellfish, harbor seals, crustacea protected by law, or part thereof, or protected insect, whether taken within the state or coming from without the state, except as permitted by the Fish and Wildlife Law.

It’s the part about *whether taken from within or coming from without the state* that makes this section so special. In essence, it means you cannot sell wildlife such as Spotted Turtles from another state or country into New York because we recognize that species as native here. New York State should not be an open market for commercializing wildlife. If a company or single internet seller offers Spotted Turtles for several hundred dollars, even from out of state, it simply encourages someone here who knows where a colony of turtles is to go and collect them to sell for personal gain. We want to make it clear that it is not just the buyer’s responsibility to know the law. It is the seller’s responsibility as well. We can’t afford the loss of our indicator species because people are encouraged to collect and sell them.

The Department of Environmental Conservation encourages anyone interested in the study of our native herpetofauna to research the list of native species and their legal status. DEC recognizes the value of hands on experiences with our reptile and amphibian species that lead toward a better understanding and stewardship of those animals. Field study and photography of New York’s herps is always encouraged, as long as the laws protecting the animals are not broken, including in some cases handling, disturbing them while nesting, and disturbing their habitat. In some situations involving the rarest of species, any close contact is discouraged or prohibited.

We also encourage reptile and amphibian enthusiasts and the public in general to become even more involved in fighting all threats to our native wildlife, including habitat loss and fragmentation, pollution, the introduction of invasive species, climate change, and illegal collecting. Those threats continue and there is much to be done to save many species. More information, including the list of New York's reptiles and amphibians and their protected status, can be found on the DEC website at:

<http://www.dec.ny.gov/regs/2494.html>

and

<http://www.dec.ny.gov/animals/7494.html>

and

[http://www.dec.ny.gov/docs/wildlife\\_pdf/vertchecklist0907.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/vertchecklist0907.pdf)

## **Historical and Contemporary Trends in the Trade in Aquatic Chelonians and its Effect on Wild Populations in the United States**

**Don Moll**

Biology Department  
Missouri State University  
Springfield, Missouri 65897  
donmoll@missouristate.edu

Archaeological evidence confirms that North American chelonians have been exploited by humans for food since prehistoric times. Aquatic turtles were soon utilized for food by colonizing Europeans, perhaps beginning with utilization of the Diamondback Terrapin and quickly expanding to include other species native to the Eastern Seaboard. Philadelphia quickly became a center of commercial trade in turtles in colonial America. By the late Nineteenth and early Twentieth Century in the East, the Diamondback Terrapin had ascended from its earlier status as slave food to the apex of gourmet fare and a brisk trade in wild and farmed animals flourished to supply demand. In the Far West, Pacific Pond Turtles largely replaced the Diamondback, often surreptitiously, in epicurean circles and a brisk trade in this species briefly flourished. Later in the Twentieth Century the upper Midwest became the hub of commercial collection of Common Snapping Turtles, softshells, and several aquatic emydid species which were transported by rail to Chicago and on to the large city markets of the Eastern Seaboard. In the Gulf States, commercial collecting of alligator snapping turtles and other species supplied New Orleans and other regional markets. In the Twenty First Century, the turtle trade has become international in scope serving a demand for food, traditional medicines, pets, etc., mainly in eastern Asian markets and collecting pressure has shifted largely to the lower Midwest and South. Research suggests that heavy collecting of natural turtle populations will result in their long-term reduction, if not complete collapse of populations, changes in size structure and demography, and sex ratios of aquatic species. Several states concerned with the consequences of heavy utilization of their resident species to satisfy the national and international market have enacted or proposed legislation to restrict commercial collecting. As turtles play important roles in natural aquatic ecosystems their plight should be of concern to ecologists as well as conservationists.

## **Turtle Farming in China, with particular reference to US species** **by Michael Lau and Shi Haitao**

### Abstract

Turtle farming in China started in 1970's but only reached commercial scale in 1990's. In the beginning, they concentrated on breeding and rearing Chinese Softshell Turtle (*Pelodiscus sinensis*) but later expanded to hard-shelled turtles. Currently, it is a multi-billion dollars business with turtle farms spread across 16 provinces that can produce hundreds of millions of turtles per year. Thirty-one species, both Chinese and exotic species, are now farm-bred on a commercial scale. These include several US species: with Red-eared Slider (*trachemys scripta elegans*) being the most abundant, followed by Florida Softshell Turtle (*Apalone ferox*) and Common Snapping Turtle (*Chelydra serpentine*). Attempts to breed and produce other species are also being carried out. Significant number of young Alligator Snapping Turtles (*Macrolemys temminckii*) are imported and raised to marketable size for consumption by some farms. As turtle farming is being seen as a good business, there is a trend of more turtle farms being established, more turtle species being bred and in greater numbers. Some big farms now operate as an enterprise and manufacture and market products like turtle wine and turtle essence. Some also run turtle-themed tours. Keeping pet turtles are also growing in popularity in Chinese cities. As in other places, rare and endangered pet turtles can fetch a very high price and farming of these may become popular and the demand for breeding stock will pose a serious threat for the endangered species.

## **Snapping Turtle Management in Maryland, Goal-Driven Collaboration within a Workgroup.**

### **Morin R.**

rmorin@dnr.state.md.us

Maryland Department of Natural Resources Fisheries Service

Tawes State Office Building, 580 Taylor Avenue, Annapolis MD 21401

A commercial fishery has harvested snapping turtles in Maryland without regard to conservation since at least the early 1870's. A workgroup was assembled in 2007 to make snapping turtle management recommendations to the Maryland Department of Natural Resources Fisheries Service. The primary recommendation was to study tidewater snapping turtles and establish a minimum size limit that would be re-examined in one year after a study provided data. Interim regulations went into effect in 2008 and a fishery-dependent snapping turtle study was conducted. The workgroup continued to meet in 2008 with clearly defined goals and objectives. Based upon the results of the length analysis, the workgroup considered options and recommended a new minimum size limit of 11 inches which was intended to protect over 50% of the females in the fishery. In 2009, new regulations were promulgated in an attempt to manage snapping turtles for sustainability. Commercial turtle harvesters submit monthly reports of daily harvest (number, pounds) and effort (number of traps). Compliance with permitting and reporting is high. The workgroup has established a continuously evolving process in which dialogue, trust and cooperation lead to results that are useful to the management of this species.

**The History of Commercial Exploitation of the Diamondback Terrapin (*Malaclemys terrapin*)  
Provides Lessons for Turtle Conservation**

**Willem M. Roosenburg**

*Center for Ecology and Evolutionary Studies  
Department of Biological Sciences  
Ohio University  
Athens, OH 45701 [roosenbu@ohio.edu]*

The diamondback terrapin (*Malaclemys terrapin*) has a long and rich history of commercial exploitation and, as a consequence, has become an iconic species for turtle conservation. The historical records of exploitation in Chesapeake Bay and the current studies of terrapin populations illustrate the susceptibility of turtle populations to over-harvesting, particularly the removal of juveniles and adults. More generally, diamondback terrapins have delayed maturity, low reproductive rates, and high adult survival: life history traits shared by almost all turtles that make them bad candidates for unregulated commercial harvest. Thus, the patterns of exploitation and decline demonstrated in terrapins can inform the conservation of all turtles subject to commercial harvest.

Terrapins were first recognized as food source and a new world resource with the potential for exploitation in 1588. By the mid 1800's the demand for terrapin flesh generated lucrative prices that drove a thriving fishery that depleted stocks throughout Chesapeake Bay and the entire species range. A peak in terrapin harvest in 1891 of almost 90,000 lbs led to a significant population decline; by 1920 only 823 lbs were harvested in Chesapeake Bay. The terrapin fishery waned until the late 1940's when a number of record harvest years reported takes in excess of 200,000 lbs / year. By the mid 1950's terrapin harvests declined again to less than 10,000 lbs / year and continued to dwindle to a minimal take in the 1980's - 90's. Beginning in 2002, terrapin harvest began to increase, correlated with an increasing demand for turtle flesh from Asian markets. The increase in harvest during the last decade contributed to the closure through legislative action of the commercial fishery.

The closure of Maryland's terrapin fishery was not regulated by the state management agency, MD- Department of Natural Resources. A grass-roots effort coordinated by a group of citizens and scientists began the legislative process that ultimately resulted in a statute that prohibits the commercial harvest of terrapins. Necessary, but not sufficient for this process was data illustrating that terrapin harvest is unsustainable, local populations had declined, and new threats (habitat loss and by-catch mortality) were reducing recruitment, juvenile, and adult survivorship. Though the historical and contemporary data could justify ending commercial exploitation, political forces made the regulatory change difficult. In the end, education, petitions, minimal economic impact, and political pressure played a much greater role in closing the fishery than the science.

Despite the end of commercial exploitation, terrapin populations in Chesapeake Bay are still struggling as habitat loss and mortality as by-catch in other commercial fisheries continues.

In particular, the mortality in the commercial blue crab (crab pot) fishery reduces juvenile survivorship; populations continue to decline despite efforts to increase recruitment through nest protection and head-start programs. Furthermore, a lack of education and enforcement of existing regulations implemented to protect terrapins contribute to a persistent decline. Although the closure of the commercial harvest was an important first step for terrapin conservation, it has not instantly put the terrapin on the path to recovery as new threats negate the impact of fishery closure.

What can we learn from the terrapin fishery in Chesapeake Bay? The twice occurring peak and collapse of the terrapin harvest during the past 150 years demonstrate the predicted rapid decline/collapse caused by commercial exploitation and the subsequent long-term recovery of turtle populations. The modern environmental context for terrapins and all turtles has deteriorated relative to the environment that allowed for the recovery of terrapins; new threats that increase juvenile and adult mortality (roads and by-catch), habitat loss and fragmentation, and pollution will stall or prevent recovery. Similar threats affect nearly all turtle populations in the United States. Education programs are critical to teach the public of the sensitivity of turtle populations, but also to expose the harvest to supply Asian markets. The general public is surprised and eager to help when they learn that turtles are commercially exploited to be shipped overseas. This public interest and concern for turtles can exert sufficient political pressure to outweigh the minimal economic gain of harvesting turtles. Finally, the elimination of the commercial exploitation of all turtles is only the start of a long-term conservation initiative that should address any and all factors that decrease juvenile and adult survivorship.

## U.S. Turtle Exports and Federal Trade Regulation: A Snapshot

### Presented by Bruce Weissgold

Division of Management Authority, U.S. Fish and Wildlife Service, International Wildlife Trade Program, Arlington, Virginia, September 2010.

This presentation provides an overview of the Convention on International Trade of Wild Fauna and Flora (CITES) and a summary of the trends in freshwater turtle exports from the United States. It also briefly highlights an Endangered Species Act (ESA) petition received by the U.S. Fish and Wildlife Service (Service) this past Spring to list nine freshwater turtle species in the southeastern United States.

CITES is an international treaty which went into effect in 1975 in the United States. The Service, authorized by the ESA, serves as the lead U.S. government agency for the Treaty's implementation and enforcement. The mission of CITES is to regulate international trade in animals and plants (as well as their parts and products) listed in the Treaty's Appendices so that trade does not threaten the survival of wild populations. International trade in CITES-listed species is regulated with permits and certificates which are presented at the time of export or import. CITES Appendix I includes species that are threatened with extinction; these species are generally not permitted in commercial trade. CITES Appendix II includes species that are not currently at risk of extinction but may become so unless their trade is monitored. The majority of CITES-listed species in international trade are listed in Appendix II. Appendix III is the least restrictive of the three Appendices in terms of the requirements for trade, and such a listing is intended for regulated species in which the listing Party is requesting the assistance of other Parties in monitoring the legality of international trade. There are many species not currently listed in CITES that might regularly enter international trade, with some evidence that ongoing trade volumes could negatively affect the status of wild populations. Species in that scenario would be appropriate to consider for an Appendix-II listing.

All native marine turtles receive full ESA and CITES Appendix I protection, and all native land tortoises are CITES-listed and receive either some or full ESA protection. For freshwater turtles, a limited number of native species are ESA or CITES-listed (or both), and the Service implements a program for the export of farmed map Graptemys spp.) and alligator snapping turtle (Macrochelys temminckii) hatchlings, which are listed in Appendix III. In April 20 of this past year, the Service received a petition from the Center for Biological Diversity to list 404 aquatic, riparian, and wetland species of the southeastern United States under the ESA. This petition includes nine freshwater turtle species. The Service's Region 4 office is leading the review of the petition to determine if it presents substantial information indicating that listing may be warranted.

The available data on turtle exports from the United States indicate that species with the most dramatic and consistent increases in exports are the common snapper (Chelydra serpentina), Florida red-bellied turtle (Chrysems nelsoni), Florida (Apalone ferox) and spiny softshells (A. spinifera) (although the softshell trade export trade has decreased in 2009), and although gross volume is much lower, the spotted turtle (Clemmys gutatta). While export levels of freshwater turtles from the United States appear variable, the long-term trend is an increase across the

board, over an extended period of time. These data suggest that changes in demand, primarily in Asia, are a major factor influencing increases or decreases in exports from the United States, although other factors may also affect exports.

The global turtle trade in the last 15 years appears to follow a pattern common in international wildlife trade – once a species either becomes depleted in the wild or restricted in trade due to regulatory action, the trade shifts to other more readily available species. In the case of the freshwater and terrestrial turtle trade, information suggests a shift to a small number of U.S. species to make up for the loss of availability of Asian species due to CITES and related regulatory and enforcement measures. In 2009, preliminary data indicates that approximately 41,000 live alligator snappers were exported from the United States, with 98% of these shipped to China.

In 2006 the United States added map turtles and alligator snappers to Appendix III at the request of the States, and the Service worked with the Association of Fish and Wildlife Agencies to design the export management program. The Service registers farming operations to receive expedited permits for their hatchlings at a reduced permit cost, and the Service manages the program on an annual cycle in which each operation must renew its registration. Although the Appendix III listings allow the Service to monitor exports and to ensure their legality, these exports tell little, if anything, about harvest rates of these turtles from the wild.