(ISSN 1526-3096)

TURTLE AND TORTOISE NEWSLETTER

The Newsletter of Chelonian Conservationists and Biologists

Issue Number 4 *August 2001*

Incorporating
Newsletter of the IUCN Tortoise and Freshwater Turtle Specialist Group
Box Turtle Research and Conservation Newsletter

Published by
Chelonian Research Foundation

in association with
Conservation International, IUCN/SSC Tortoise and Freshwater Turtle Specialist Group,
Chelonian Research Institute, Wildlife Conservation Society, Chelonia Institute, AZA Chelonian Advisory Group,
and IUCN (The World Conservation Union) – Species Survival Commission

Turtle and Tortoise Newsletter

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TURTLE AND TORTOISE NEWSLETTER (ISSN 1526-3096) is an international newsletter dedicated to providing an open forum for the timely exchange of information on freshwater / terrestrial turtle and tortoise conservation and biology issues. It incorporates and merges the previous publications of the Newsletter of the IUCN Tortoise and Freshwater Turtle Specialist Group and the Box Turtle Research and Conservation Newsletter.

Submissions are welcome from any source or individual and are in no manner limited to Specialist Group members. Articles may cover any aspects of turtle and tortoise news or research, with a preference for conservation or biology. TTN focuses on freshwater and terrestrial turtles and tortoises; items dealing with sea turtles should be directed to Marine Turtle Newsletter, an independent and separate publication. Of particular interest to TTN are news items and preliminary research or field reports dealing with conservation biology, population status and trends, human exploitation or conservation management issues, community conservation initiatives and projects, legal and trade issues, conservation and development threats, geographic distribution, natural history, ecology, reproduction, morphology, captive propagation, and husbandry. Newsnotes, announcements, commentaries, and reviews of interest to the turtle conservation and research community are also welcome. Submissions will not be peer-reviewed, but minor review and final acceptance for publication is at the discretion of the Editorial Staff. Submit material directly to either H. Kalb or A. Salzberg at the addresses above.

TTN will be published approximately quarterly or periodically as the need arises by Chelonian Research Foundation with additional support provided by Conservation International. Institutional association also includes the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, Chelonian Research Institute, Wildlife Conservation Society, Chelonia Institute, AZA Chelonian Advisory Group, and IUCN (The World Conservation Union) - Species Survival Commission. All opinions expressed are explicitly those of the authors and do not necessarily reflect those of the Editorial Staff or any of the Associated Institutions.

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Recent financial donors will be acknowledged by name in the next issue of TTN. Until then, thank you!

Bog Turtle Conservation, Research, and Education Programs at The Baltimore Zoo

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Regarded as one of the world's rarest chelonians, the bog turtle (*Clemmys muhlenbergii*) is a small semi-aquatic species occurring in disjunct populations ranging from New York to northeastern Georgia (Ernst *et al*., 1994). It is found primarily in wet-sedge meadows, spring-fed wetlands characterized by soft mud bottoms and shallow water channeled into rivulets by tussock sedges and other emergent vegetation. Habitat alteration and illegal collection are the primary reasons for its decline. The species is given Appendix I status by the Convention on International Trade in Endangered Species (CITES), threatened status by the United States Fish and Wildlife Service (USFWS), and is also protected by state laws throughout its range.

Due in part to its secretive nature, the bog turtle was not discovered in Maryland until 1941 (McCauley and Mansueti, 1943). Presently, Maryland contains roughly one-third of all recorded bog turtle sites, but nearly half of these have been lost in the last twenty years (Lee and Norden, 1996).

Habitat restoration efforts to date have consisted almost exclusively of fencing sites to control grazing and of removing undesirable invasive vegetation. Prior to the completion of The Baltimore Zoo's bog exhibit (Wisnieski and Poole, 1999), no attempts had been made to restore sites that were excavated to create ponds (Scott Smith, personal communication). Therefore this exhibit serves as a blueprint for restoration efforts *in situ*. It also enables us to educate over 600,000 visitors, most of whom reside within the bog turtle's range, about the plight of this disappearing species, the importance of its habitat, and the actions that can be taken to make a difference (Fig. 1).

Figure 1. A young girl rides a human-sized bog turtle at the Baltimore Zoo.

Site Selection

A spring-fed pond, which was the first exhibit in the Lyn P. Meyerhoff Maryland Wilderness section of the zoo, was the site of the restoration. The theme of the Maryland Wilderness area is "a walk across Maryland," with a series of immersion exhibits depicting various Maryland habitats and displaying associated wildlife and plant species. Educational signage emphasizes the importance of protecting the Chesapeake Bay watershed.

Site Preparation

The restoration of the site began in October 1997. The adjacent woodland was cleared to provide an open, sunny area, critical to the bog turtle and the plant species in a wet sedge meadow habitat. A Grade-All machine was brought in to reshape the topography, with the goal of creating the largest possible wetland footprint. The difference in elevation between the upper section where the pond was located and the lower extremes of the wetland area necessitated the creation of two distinct wet sedge meadows with a connecting stream corridor. Dams, consisting of smooth, flat river stones, were placed at the bottom of each separate wetland and provided a means of adjusting the water levels.

The pond was drained and the pump was left running in the deepest section (Fig. 2). Invasive parrot feather (*Myriophyllum aquaticum*) and saturated soil were removed by the Grade-All. Once excavation to the natural clay layer was completed, PVC pipes were driven into the

Figure 2. The spring-fed pond is drained.

locations with the greatest spring flow. The purpose of the pipes was to ensure a path for the spring water to reach the surface. The former pond area was then filled to the desired elevation with pea gravel and covered with filter cloth (Fig.3). Suitable wetland soil donated by the Maryland State Highway Administration and the previously removed saturated soil were used to fill in the remainder of the pond site. The pipes were then filled with large pieces of crushed rock which allowed water to flow, but eliminated potential death traps for the turtles.

Figure 3. Pea gravel being added.

The lower section of the wetland had previously consisted of a small stream approximately 0.6 m (2 ft) wide that drained the pond and of an additional spring seep. A shallow basin was excavated using the Grade-All and then wetland soil was added (Fig. 4).

Though both sections now held water, we still had not managed to achieve the proper consistency in the saturated soil, or muck layer, which defines these wet sedge meadow habitats. Michigan peat was pumped into the two sites until they had the correct "feel" of wading through a wetlands.

Planting the Bog

Selecting the appropriate plant species in the proper proportions was critical to the restoration. A plant list was generated utilizing data collected on plant communities in Maryland bog turtle habitats. The most numerous species planted included tussock sedge (*Carex stricta*), arrowhead (*Saggitaria latifolia*), marsh fern (*Thelypteris palustris*), monkey flower (*Mimulus rungens*), turtlehead (*Chelone glabra*), and swamp milkweed (*Asclepias incarnata*). All plants were purchased from a nursery that specializes in cultivating native plant species.

Figure 4. An overview of the two wetland sections and the interconnecting stream.

Staff from the zoo, Maryland Department of Natural Resources (DNR), Maryland Department of the Environment (MDE), Sylva Native Nursery, middle school students and teachers participated in planting the wetland in May of 1998. Equal proportions of Michigan peat and topsoil were deposited in the deeper sections to create surface level mounds for the plants. Tussock sedge, the most abundant species, was the first to be planted (Fig.5). These were used to break-up the sheet flow into the rivulets of water typical of these habitats. Color-coded signs with the names of specific plants indicated where they should be planted.

A bog turtle was maintained on-site and impromptu presentations and question and answer sessions were provided for the crowds of inquisitive visitors that would stop along the boardwalk.

Presentations were also provided for the students during lunch and informal teaching was on going throughout the planting phase. Through their hands-on

Figure 5. Tussock sedge being planted.

participation in this project, the students gained an appreciation for the importance of these wetland habitats that would be difficult to instill in a traditional classroom setting (Fig.6).

Figure 6. A middle school student takes a break after helping plant the restored bog for this little bog turtle.

The plant community is continuously monitored and any undesirable invasives are eliminated.

Animal Containment

To contain the turtles, a plastic-coated hardware cloth fence buried to a depth of 30 cm (1 ft) encloses the exhibit. The installation of the final fence sections did not occur until July of 1999, which allowed time for native wildlife species to colonize the area. Faunal components of *in situ* sites, such as meadow voles (*Microtus pennsylvanticus*), green frogs (*Rana clamitans melanota*), Southern leopard frogs (*Rana utricularia*), American toads (*Bufo americanus*), Eastern garter snakes (*Thamnophis s. sirtalis)*, Northern water snakes (*Nerodia s. sipedon),* as well as numerous species of birds and invertebrates, have all been observed in our restored wetland.

Potential bog turtle predators, such as raccoons (*Procyon lotor*) are kept out of the area through the use of hot wires which surround the site.

Research Components

The bog exhibit also serves as an on-grounds study site. A primary goal of this project is to gather data that will benefit *in situ* restoration efforts. In collaboration with Towson University, a habitat utilization study is being conducted. Transmitters attached to three male and six female bog turtles and the same number of spotted turtles (*Clemmys guttata*) which share the exhibit, enable us to track the turtles' movements and also to monitor their temperatures remotely. This data will be compared to data from ongoing studies *in situ* being conducted by biologists from Frostburg State University, as well as to previous studies (Chase, *et al*., 1989; Lovich, J.E., *et al*., 1992; Carter, *et al*., 1999; Morrow, *et al*., 2001; Behler, unpub. data; Stine, unpub. data).

DNA fingerprinting will provide a means of determining (and comparing) the degree of inter-relatedness in both the zoo's captive bog turtle population and the population from which they were collected, as well as the parentage of any offspring produced. This is part of a larger study conducted in conjunction with the DNR and Frostburg State University, which involves DNA fingerprinting and disease screening of a minimum of ten bog turtles from each Maryland watershed from which they are known. Zoo staff also continue their involvement in DNR's long-term bog turtle population and habitat assessment surveys.

Other species of reptiles, amphibians, mammals, birds, and invertebrates that have colonized or frequented our bog are also being monitored through periodic trapping and direct field observation, and these data will be compared to data on wild populations. Since the number of plant species and their locations within the site are known, data will be gathered on their survivability and on the presence of opportunistic invasives.

Educational Components

One of the greatest challenges presented by this exhibit was its interpretation. How does one capture the public's interest when they cannot see the bog turtles?

All educational elements were designed to ensure that the exhibit's conservation message appeals to all age groups. While some of the graphics are written for adults, parallel signs mounted directly below target children, with the help of an illustrated character named "Billy Bog Turtle." Each sign station, therefore, provides a family-oriented educational experience which begins on the lower observation deck and continues along the boardwalk. The lower deck is also used for Keeper Encounter presentations where staff demonstrate the use of telemetry equipment.

On each deck children are greeted by a realistic fiberglass model bog turtle measuring 1.65 m (5.5 ft) in length upon which they can climb. The model turtles are surrounded with planters containing maiden grass (*Miscanthus sinensis*) which resembles giant tussock sedges. Together with the giant models, these create an environment where children are the same size as the turtles.

Both decks and an adjacent swinging bridge are coated with spongy rubber (Vitriturf ®) to simulate the sensation of walking in a bog.

Additionally, the Baltimore Zoo has collaborated with other organizations on the following bog turtle conserva-

tion education projects: 1) Producing an educational brochure on Maryland's bog turtles [DNR/MDE/National Aquarium in Baltimore (NAIB)/USFWS]; 2) Organizing a land-owners forum at a local community college to explain the importance of these disappearing wetlands to the people who own the majority of them and to disseminate information on state and federal tax incentive/conservation easement programs and funding sources for habitat restoration (DNR/MDE/NAIB/USFWS); 3) Conducting a workshop on bog turtle conservation targeting local, state, and federal planning and regulatory agencies, conservation/education organizations, and private consultants that may be effected by the bog turtle's recent classification as a federally threatened species. Field trips to pristine and impacted bog turtle habitats and a comprehensive resource guide were provided (DNR/Maryland Herpetological Society/MARS Preservation Fund/NAIB).

Project Funding

DNR and MDE allocated wetland mitigation funds for this project. Additional funding, materials, and services were provided by the Maryland Conservation Corps, the Maryland State Highway Administration, Defenders of Wildlife, Concrete General, Inc., the Mid-Atlantic Turtle and Tortoise Society, Daniel G. Schuster, Inc., students and teachers from Parkville Middle School, and private donors. The total value of these contributions is approximately $75,000.

The Baltimore Zoo was also awarded a $30,000 grant for educational graphics by the Chesapeake Bay Trust, as well as a $1,000 award from The Tortoise Reserve, Inc. (TTR) for its innovative chelonian educational program. For the exhibit, TTR also provided the nine bog turtles, which were legally collected from a known Maryland locality in the early 1990s.

Summary/Conclusion

Through the commitment of all of the partner organizations involved, the wetland restoration project at the Baltimore Zoo has accomplished all of its initial objectives. We now have a beautiful wet sedge meadow exhibit for our turtles and other wildlife, complete with immersive and interactive elements and educational messages consistent with our other Maryland Wilderness exhibits. Most importantly, we also have an on-grounds study site, which provides data that will be extremely valuable to *in situ* restoration efforts.

In considering everything we have learned from this project, the one fact that stands out above the rest is that restoring a wetland is much more difficult and expensive than protecting one.

Acknowledgments

The authors would like to express their appreciation to the following individuals for their help in making this project a reality: George Beston, Don Forester, Alexis Grant, Dave Lee, Kevin Smith, Scott Smith, and Herman Twining. Additional thanks go out to all Baltimore Zoo staff who have been involved in this project and to all of the organizations previously mentioned in this paper who have provided funding, materials, and services. Thanks to Heather Kalb for assistance with this article. Finally, we would thank our Executive Director, Roger Birkel, for supporting an exhibit for nine tiny turtles that few visitors will ever see!

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FYI: News Articles on Freshwater Turtles and Tortoises

Starting in the 5th issue of TTN, Brigid Ransom will be compiling and summarizing turtle news articles from around the world. Please forward electronic copies of these articles to her at yaxteel@aol.com or mail the articles to her at Brigid Ransom, c/o Heather Kalb, Dept of Biology, West Chester Univ., West Chester PA 19383.

Please make sure the article's author, date and source are included.

Workshop Addresses Long Range Protection and Management of Bog Turtle Habitat in Maryland

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The Tortoise Reserve, Inc., Jug Bay Wetlands Sanctuary, and Conservation International hosted a day-long workshop to develop action plans for the long-range protection of bog turtle habitat in Maryland. The meeting was held at Jug Bay on 27 February 2001. Participation was by invitation and the number of people invited was limited to allow for a productive working atmosphere. The fifty people who attended represented a wide range of conservation interest groups from both the private and public sectors. The action plans developed are ones that will address the needs and concerns of the entire conservation community. A published summary of the workshop will be made available.

The bog turtle has been listed as a threatened species in the northern portion of its range (Federal Register: November 4, 1997. Vol. 62 No. 213). Maryland bog turtles are part of this northern population and sites of occurrence support some of the most important populations of this species. Minimally 25-30% of the global population now occurs in four Piedmont counties of Maryland. These turtles have off and on been listed as state threatened or endangered since the early 1970s. Studies conducted by the Maryland Department of Natural Resources in 1992 and 1993 indicated that the state's bog turtle population had declined 43% over the previous 15 years. Thus, this is one of the few reptile species listed as a conservation priority where we have real numbers to show declines over time. While over collection for the pet trade is usually listed as the main reason for the rarity of this turtle, loss of natural habitat through development, natural succession, and succession accelerated by man's activities are the primary reasons for the species decline. The state of Maryland had done an excellent job of gathering base line information and is strictly enforcing the loss of additional wetland habitat through development. However, in Maryland over 97% of the sites of known occurrence are on private lands (all the important sites are on private lands). Few coordinated efforts have been made to work with land owners to educate them about the needs of the turtle, to control succession, to work the wetlands into land easements, or to provide other incentives for land owners to manage lands in ways that provide viable habitat for the species.

This bog turtle conservation effort is a classic example of a program that is not clearly under the mandate of a single group or agency. The grass roots conservation and management efforts which are now needed do not fall under any particular agency, are outside the scope of traditional academic interest, and will not generate the level of outside funding that the larger conservation organizations typically require to become involved. The sites on private lands will probably always be held in private hands. Most local conservation programs have failed to effectively work the bog turtle into their long-range goals. A major meeting, spear headed by the state's Department of Natural Resources, which addressed all levels of conservation needs for Maryland's bog turtles, was held in the spring of 1999. In part, our 2001 workshop was a follow up effort so that the interest and information generated at that meeting could be put to use and to encourage increased involvement by the private sector. While it is clear that bog turtle conservation is a concern of many organizations and agencies, to date major activities were largely limited to those of the Maryland Department of Natural Resources. It is our opinion that the private landowners need to be the focus of such activities and that NGOs and local land trust need to play key roles in working with these landowners.

Bog turtle conservation is complicated by the fact that former rural areas are under high end development (mostly suburban housing) and recently passed ordinances often prohibit domestic animals, burning, and in one county, unregulated tree removal. Thus, many traditional methods, which formerly kept the wetlands open, are now unavailable to landowners. Former farmers who are of advanced age own many of the sites. At their passing, most sites will be subdivided and sold by their children. In the next 15 years, we anticipate a decline in the number of occupied bog turtle sites similar to the decline documented from the mid 1970s through the early 1990s. Maryland's Department of Natural Resources is planning a follow up survey to document the status of bog turtle habitat starting in 2001. In addition to this upcoming survey, the participants in the meeting strongly believe that focused conservation efforts (land easements, succession management, education) need to begin immediately.

The morning session of the 2001 workshop was intended to bring everyone up to date on the current situation. The afternoon consisted of a number of meetings of sub-committees charged with the development of action plans for long term conservation of local populations. An informal evening session lead by Kevin Smith (MD Department of Natural Resources) and supported by pizza and beer, discussed the action plans proposed by the various working groups and attempted to fine tune activities and to build on areas of consensus. This workshop was put together by a total volunteer effort, a zero budget, and complete lack of registration fees. While the program would have benefited from an additional half day of activity, this was not realistic, and we feel that most of our initial goals were met. The working groups continued to work together (mostly through e-mail) for several weeks

following the meeting. The following topics were presented in the morning session: An overview of the biology and natural history of the bog turtle (Dave Lee, Tortoise Reserve), Current status and conservation activities in Maryland (Scott Smith, MD Department of Natural Resources), Management of metapopulations (Kurt Buhlmann, Conservation International), A summary of the structure and activities of Project Bog Turtle in the Southern Appalachians (Dennis Herman, NC State Museum); Some recent activities regarding bog turtles (educational slide set, breeding bird surveys in bog turtle wetlands, the Tortoise Reserve's Sanctuary Program: Dave Lee), The Baltimore Zoo's education program (Anthony Wisenieki, Baltimore Zoo), Succession and invasive plant eradication (Dennis Herman), The role and limitations of land trust (Mike Hollins, Mason Dixon Land Trust), Building local consensus (William Branch, MD State Highway Department), and Legal issues and the Safe Harbors Program (Andy Moser USFWS).

The afternoon working groups consisted of preparation of the following guidelines and documents: A primer of conservation options for private land owners; Coordinating programs between land owners, private organizations, and county, state and federal agencies; Education and public relations; Options for control of invasive woody and exotic plants; Restoration of wet lands; Development of a land owners/managers guide to care of sites and a packet of resource information for land owners; and Long-range planning. Information on portions of these programs is available at <www.tortoisereserve.org> under research and conservation. Representation from the academic community, state and federal agencies, NGOs, regional land trust, people working on wetland conservation issues in other states, and volunteer regional invasive plant control groups was well balanced and provided the working groups with perspectives from many disciplines. While the reports from all the working groups are not yet completed, it became clear that everyone was in agreement that the following goals were key to the survival of bog turtles in Maryland:

- Long-term conservation of metapopulations of bog turtles needs to involve the private sector and the working groups recognized that the private sector has many tools and much flexibility, which are not always available to public agencies.
- A program needs to be set in place so that conservation efforts are run locally and are structured to perpetuate. Much of this could be accomplished by working with regional conservation programs which are already in place but that have established missions which are not directly related to bog turtles.
- If we could secure 5 important sites and any number of secondary sites in a metapopulation and have one to two metapopulations established per county (or sub drainage units) this would provide tangible results on which future efforts could build.
- Captive breeding should be considered as a viable strategy for providing stocks to restored wetlands of specific drainage systems.
- For long-term protection, a grass roots program such as the one developed by Project Bog Turtle for the southeast is needed with establishment of some sort of standing committee to oversee and coordinate individual efforts.
- Ongoing educational components are critical at all levels.

We see what develops from this workshop as being the ground work for a program which is broad based and can be locally modified to fit the Bog Turtle Recovery Plan of USFWS once the draft plan is finalized.

The meeting was intended to act as a catalyst to increase interest in protecting an additional number of bog turtle sites and to assure or reestablish the appropriate successional windows at the currently protected sites. Many of the components of action plans proposed are in place, the sites of occurrences are known, and the needs of the turtle are reasonably well understood. The participants recognized a need for coordination and the desire to get an aggressive, locally run, conservation program in place using segments of existing programs and regulations. These activities need to involve the private sector. The program will be a combination of educational and awareness activities coupled with land management and site protection. The latter is to come from land trusts, easements, trying to lower county taxes on key sites, donations, and perhaps purchase. In addition to protection, sites will need periodic management, and some may require major restoration. There is enough local interest that much of these activities can be run on volunteer effort.

We anticipate that this workshop will result in a fast track conservation effort. We received a number of favorable responses from those who were present at the workshop. Within days of the meeting a local land trust had written and submitted grant proposals for acquiring easements of key wetland sites. Additionally, the state and federal agencies helped us set up a program for control of invasive woody vegetation at several important sites on private farms. A number of draft accounts of morning and afternoon sessions have been submitted, and Tom Wilson, George Mason University, has agreed to edit our written summary of the workshop. Educational programs are being developed for local schools, and we have a request from individuals in Pennsylvania to host a similar workshop there. A web site address has been secured which will be available for sharing information as the program matures.

United States Import and Export of Live Turtles and Tortoises

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Reptiles are becoming increasingly popular as pets in the United States. The Humane Society of the United States (HSUS) commissioned a study to review available information on this largely unstudied, but increasingly significant, segment of the pet industry in order to assess its implications for the humane treatment of reptiles that are traded and kept as pets, the conservation of reptile populations in the wild, and the health of humans, wildlife and agricultural animals. The resulting report, entitled *Reptiles as Pets: An Examination of the Trade in Live Reptiles in the United States,* is currently in press. The report presents the results of an analysis of live reptile import and export data, from 1989 through 1997, which were obtained from the United States Fish and Wildlife Service's Law Enforcement Management Information System (LEMIS). This paper provides the results of this analysis as it pertains to turtles and tortoises.

More than 18.3 million live reptiles, representing over 600 different taxa, were imported to the United States from 1989 through 1997. This included more than 5.7 million turtles and tortoises representing 142 taxa (Table 1 and 3). Turtles and tortoises are the most popular type of reptile kept as pets in the United States (APPMA 2001). About 9 million reptiles were kept as pets in the United States in 2000, a more than 10% increase since 1998 (ibid). The number of households with pet reptiles rose by 44% during the same period (ibid).

In 1997 alone, more than 1.7 million reptiles were imported. This included over 258,000 turtles and tortoises. In 1997 lizards were the most commonly imported reptiles (70.0%), followed by snakes (12.8%), turtles (15.0%), and crocodilians (1.1%). Some of the most frequently imported reptiles were the common green iguana (*Iguana iguana*) from Colombia and El Salvador, geckos (*Hemidactylus* spp.) from Thailand and Vietnam, the ball python (*Python regius*) from Benin and Togo, the water dragon (*Physignathus concincinus*) from Vietnam, the boa constrictor (*Boa constrictor*) from Colombia and Nicaragua, oriental racer lizards (*Takydromus* spp.) from China and Indonesia, and spiny lizards (*Sceloporus* spp.) from Nicaragua and Guatemala.

Some of the most frequently imported turtle and tortoises in 1997 included the indigenous red-eared slider (*Trachemys scripta elegans*), map turtles (*Graptemys* spp.) and painted turtles (*Chrysemys* spp.). These animals were contained in shipments returned to the United States after being exported and rejected by an importing country. The most commonly imported non-indigenous species of turtles and tortoises imported included the central Asian tortoise (*Testudo horsfieldi*), Malayan box turtle (*Cuora amboinensis*), Bells' hinge-back tortoise (*Kinixys belliana*), leopard tortoise (*Geochelone pardalis*), African helmeted turtle (*Pelomedusa subrufa*), and Home's hinge-backed tortoise (*Kinixys homeana*).

In 1997 most live reptiles were imported through the ports of Miami, Florida, or Los Angeles, California, which were also home to the largest reptile importers, including L.A. Reptiles, Strictly Reptiles, and California Zoological Supply. According to the importers, the value of the live reptiles they imported in 1997 was more than $6.5 million, but this is a fraction of the retail value of the reptiles they imported. Based on information from the APPMA survey (2001), the HSUS estimates that the retail value of the trade in live reptiles and amphibians and related products in the U.S. is worth about $2 million annually.

More than 57.8 million reptiles, representing over 570 taxa, were exported from the United States between 1989 through 1997. This included over 53.7 million turtles and tortoises representing 115 taxa (Table 2 and 3).

In 1997 alone, more than 9.3 million reptiles were exported. This included over 8.9 million turtles and tortoises. In 1997 turtles were the most commonly exported reptile (96.6 %), followed by lizards (2.4 %), snakes (0.5 %), and crocodilians (0.2 %). Some of the most commonly exported reptiles were the red-eared slider (*Trachemys scripta elegans*) (which made up the vast majority of exported reptiles), common green iguana (*Iguana iguana*), and Carolina anole (*Anolis carolinensis*). The most commonly exported turtles included map turtles (*Graptemys* spp.), basking turtles (*Pseudemys* spp.), river cooter (*Pseudemys concinna*), Mississippi map turtle (*Graptemys kohnii*), painted turtle (*Chrysemys picta*), snapping turtle (*Chelydra serpentina*), Florida red-bellied turtle (*Pseudemys nelsoni*), and alligator snapping turtle (*Macroclemys temminckii*).

According to the exporters, the value of the live reptiles they exported was more than $12.5 million in 1997. In 1997 most live reptiles were exported through the port of New Orleans, Louisiana, which is home to many exporters of red-eared sliders. Most exported reptiles were destined for Asia (China, Hong Kong, and South Korea) .

Reptiles as Pets: An Examination of the Trade in Live Reptiles in the United States will be available from The HSUS this summer.

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Data Source: HSUS analysis of Law Enforcement Management Information System (LEMIS) data obtained from the U.S. Fish and Wildlife Service. It should be noted that previous studies have demonstrated that LEMIS data contain keystroke errors and LEMIS significantly under-reports actual import and export quantities.

Table 1. Live turtles/ tortoises imported to the United States, 1989-1997. A dash indicates no data were provided by LEMIS.

Scientific Name	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Acanthochelys macrocephala (Big head Pantanel turtle)	—	—	—	—	—	—	—	—	150	150
Amyda species (Asiatic softshell turtles)	—	—	—	—	—	—	—	223	31	254
Annamemys annamensis (Anam leaf turtle)	—	—	—	—	—	—	—	—	3	3
Apalone (Trionyx) ferox (Florida softshell turtle)	—	—	—	—	—	—	—	—	42,101	42,101
Callagur borneoensis (Painted terrapin)	—	—	—	—	—	—	—	15	12	27
Caretta caretta (Loggerhead sea turtle)	15	—	41	1	—	—	20	15	—	92
Carettochelys insculpta (Pig-nosed turtle)	—	—	—	—	—	—	—	1	—	1
Chelodina sp. (Snake & side-necked turtle)	—	—	—	—	—	—	—	6	24	30
C. novaeguineae (New Guinea snake-necked turtle)	—	—	—	—	—	—	9	—	—	9
C. reimanni (Reimann's snake-necked turtle)	—	—	—	—	—	—	—	—	6	6
C. siebenrocki (Siebenrock's side-necked turtle)	—	—	—	—	—	—	19	11	35	65
Chelonia mydas (Green sea turtle)	869	68	45	417	69	—	1	—	4	1,473
Cheloniidae (Hard shelled sea turtles)	798	2,473	1,838	2,455	2,649	381	—	1	1	10,596
Chelus fimbriatus (Matamata)	—	—	—	—	—	—	10	10	23	43
Chelydra serpentina (American snapping turtle)	—	—	122	493	1,600	235	—	—	7	2,457
Chersina angulata (S. African bowsprit tortoise)	22	72	4	114	121	7	9	14	5	368
Chinemys reevesii (Chinese 3-keeled pond turtle)	—	—	—	—	—	162	31	18	18	229
Chrysemys species (Painted turtles)	1,209	1,673	8,515	12,659	11,906	2,389	320	—	3,040	41,711
Chrysemys picta (Painted turtle)	—	—	—	—	—	—	—	—	1	1
Cistoclemmys species (Southeast Asian box turtles)	—	—	—	—	—	—	—	257	10	267
Clemmys species (North American turtles)	389	220	648	590	201	162	68	315	301	2,894
Clemmys guttata (Spotted turtle)	—	—	—	—	—	—	—	—	4	4
Clemmys insculpta (Wood turtle)	—	—	—	—	—	3	—	—	—	3
Cuora species (Asian box turtles)	1,441	1,119	3,763	8,509	13,334	6,448	1,855	631	347	37,447
C. amboinensis (Malayan box turtle)	—	—	—	—	164	3,739	5,597	2,591	5,768	17,859
C. flavomarginata (Yellow marginated turtle)	—	—	—	143	11	309	1,071	356	272	2,162
C. galbinifrons (Indochinese box turtle)	—	—	—	—	32	282	471	474	912	2,171
C. mccordi (McCord's box turtle)	—	—	—	—	—	—	—	—	4	4
C. pani (Pan's box turtle)	—	—	—	—	—	—	—	—	19	19
C. trifasciata (Chinese 3-striped box turtle)	—	—	—	—	—	—	10	—	13	23
C. zhoui (Zhou's box turtle)	—	—	—	—	—	—	—	—	2	2
Cyclemys species (Leaf turtles)	—	—	—	—	—	—	50	76	456	582
Cyclemys dentata (Asian leaf turtle)	—	—	—	—	—	—	101	380	1,067	1,548
Deirochelys reticularia (Chicken turtle)	—	—	3	12	7	—	—	—	—	22
Dermatemys mawii (Central Amer. river turtle)	—	—	—	—	3	—	—	—	—	3
Dermochelys coriacea (Leatherback sea turtle)	118	138	10	—	6	—	—	—	—	272
Elseya species (Australia/New Guinea snapping turtle)	—	—	—	—	—	—	—	11	37	48
Emydoidea blandingii (Blanding's turtle)	2	17	—	12	2	—	—	—	1	34
Emydura species (Short-necked side-necked turtles)	—	—	—	—	—	—	—	—	14	14
E. albertisii (Red-bellied short-necked turtle)	—	—	—	—	—	—	1	35	96	132
Emys orbicularis (European pond turtle)	—	—	—	—	—	—	—	—	257	257
Eretmochelys imbricata (Hawksbill sea turtle)	—	20	56	93	6	—	—	3	—	178
Geochelone species (Land tortoises)	—	—	—	—	—	—	70	—	29	99
G. carbonaria (S. American red-footed tortoise)	315	298	1,462	604	302	243	150	730	979	5,083
G. chilensis (Chaco tortoise)	705	6	5	—	1	8	—	1	3	729
G. denticulata (S. American yellow-footed tortoise)	363	375	424	588	351	266	143	96	377	2,983
G. elegans (Indian star tortoise)	4	—	38	187	525	9	—	4	164	931
G. elephantopus (Galapagos tortoise)	—	1	—	1	—	1	—	—	—	3
G. gigantea (Aldabra tortoise)	—	10	18	10	1	10	—	13	—	62
G. nigrita (Indefatigable tortoise)	—	—	—	—	—	—	—	—	36	36
G. pardalis (Leopard tortoise)	877	1,329	4,336	1,029	314	682	246	424	2,536	11,773
G. radiata (Radiated tortoise)	—	—	—	3	—	—	—	1	—	4

Table 1. Live turtles and tortoises imported to the United States, 1989-1997 (cont).

Name	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Geochelone sulcata (African spurred tortoise)	37	143	232	12	295	521	1,007	235	500	2,982
G. yniphora (Northern Madagascar spur tortoise)	—	—	1	—	—	—	—	—	—	1
Geoemyda species (Asian leaf turtles)	—	—	—	—	—	—	—	183	61	244
Geoemyda spengleri (Black breasted leaf turtle)	—	—	—	—	—	120	392	463	355	1,330
Gopherus agassizii (Desert tortoise)	—	—	2	—	—	—	—	6	12	20
Gopherus polyphemus (Gopher tortoise)	—	—	—	1	—	—	—	—	—	1
Graptemys species (Map turtles)	1,552	2,429	4,590	5,170	4,685	440	1	—	10,290	29,157
G. kohnii (Mississippi map turtle)	—	—	—	—	—	—	—	—	483	483
G. oculifera (Ringed map turtle)	—	—	—	—	—	1	—	—	—	1
G. pseudogeographica (False map turtle)	—	—	—	—	—	—	—	—	100	100
G. versa (Texas map turtle)	—	—	—	—	—	—	—	—	30	30
Heosemys species (Asian forest and pond turtles)	—	—	—	—	—	—	26	57	315	398
H. spinosa (Spiny turtle)	—	—	—	25	2	77	127	90	52	373
Hieremys species (Temple turtles)	—	—	—	—	—	—	4	6	17	27
Homopus areolatus (Beaked cape tortoise)	—	20	6	34	51	4	1	2	6	124
Homopus femoralis (Karroo cape tortoise)	—	—	—	2	—	—	—	—	5	7
Homopus signatus (Speckled cape tortoise)	—	—	—	—	18	—	—	—	—	18
Hydromedusa species (S. American snake-necked turtles)	56	197	74	—	150	—	32	—	—	509
Indotestudo elongata (Elongated tortoise)	47	191	25	252	42	50	55	18	14	694
Indotestudo forsteni (Travancore tortoise)	80	62	—	21	60	114	—	7	32	376
Kachuga tecta (Indian roofed turtle)	—	—	—	—	—	—	—	—	2	2
Kinixys species (Hinge-back tortoises)	—	—	—	—	—	9	—	—	2	11
K. belliana (Bell's hinge-backed tortoise)	9,814	1,234	917	2,028	1,938	2,540	1,545	865	3,255	24,136
K. erosa (Serrated hinge-back tortoise)	167	577	190	617	86	119	35	109	4	1,904
K. homeana (Home's hinge-backed tortoise)	989	1,830	1,356	1,498	2,060	2,376	1,026	346	1,728	13,209
K. natalensis (Natal hinge-backed tortoise)	—	—	—	—	—	50	—	—	10	60
Kinosternon species (Mud turtles)	844	118	440	668	1,013	416	178	40	288	4,005
Kinosternon angustipons (Narrow-bridged mud turtle)	—	—	—	—	—	—	—	—	127	127
Lepidochelys kempii (Kemp's ridley sea turtle)	19	—	—	—	13	—	180	—	180	392
Lepidochelys olivacea (Olive ridley sea turtle)	25	223	—	—	40	—	—	—	—	288
Lissemys punctata (Indian flapshell turtle)	—	—	—	—	—	2	—	50	—	52
Macroclemys temminckii (Alligator snapping turtle)	13	607	1,683	299	1,191	201	—	—	150	4,144
Malaclemys species (Diamondback terrapins)	—	—	126	—	283	63	—	—	71	543
Malacochersus tornieri (Pancake tortoise)	385	369	5,168	605	—	—	100	—	21	6,648
Malayemys subtrijuga (Malayan freshwater snail-eating)	—	—	—	—	—	—	4	24	97	125
Manouria emys (Asian brown tortoise)	41	39	221	17	68	68	776	41	92	1,363
Manouria impressa (Impressed tortoise)	19	—	—	—	50	10	152	48	191	470
Mauremys species (Turtles)	—	—	—	—	—	—	3	11	173	187
Melanochelys tricarinata (Tricarinate hill turtle)	—	—	—	—	—	—	—	1	18	19
Morenia petersi (Indian eyed turtle)	—	—	—	—	—	—	—	—	265	265
Notochelys platynota (Malayan flat-shelled turtle)	—	—	—	—	—	—	—	9	23	32
Pelomedusa subrufa (African helmeted turtle)	714	560	382	1,370	1,248	680	454	785	1,900	8,093
Pelusios species (African mud turtles)	—	—	—	—	—	332	77	265	54	728
P. adansonii (Adanson's mud turtle)	—	200	—	—	—	—	—	2	—	202
P. castaneus (W. African mud turtle)	—	—	115	2	—	—	—	10	—	127
P. gabonensis (African forest turtle)	—	—	1	14	20	20	100	112	340	607
P. niger (W. African black forest turtle)	563	837	613	731	284	283	156	144	225	3,836
Phrynops species (S. American freshwater turtles)	—	—	—	—	—	—	13	15	98	126
Platemys species (S. American freshwater turtles)	50	34	203	139	198	69	32	—	25	750
Platysternon megacephalum (Big-headed turtle)	—	—	—	—	—	80	424	705	66	1,275
Podocnemis erythrocephala (Red-headed amazon river)	—	—	—	—	—	—	—	—	10	10
Podocnemis expansa (Giant S. American river turtle)	6	—	13	—	—	—	—	—	43	62
Podocnemis lewyana (Magdalena river turtle)	—	1	—	—	—	—	—	—	—	1
Podocnemis sextuberculata (6-tubercled amazon river turtle)	—	—	6	—	—	—	—	—	—	6
Podocnemis unifilis (Yellow-spotted amazon river turtle)	—	2	2	—	1	—	—	—	—	5
Psammobates species (S. African tortoises)	—	—	—	—	—	15	—	—	—	15
P. geometricus (Geometric tortoise)	—	1	—	—	—	—	—	—	—	1
P. oculifera (African serrated star tortoise)	—	1	—	4	2	5	—	—	—	12
P. tentorius (African tent tortoise)	—	—	3	1	3	11	—	—	—	18

Table 1. Live turtles and tortoises imported to the United States, 1989-1997 (cont).

Name	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Pseudemys species (Basking turtles)	—	—	—	—	—	—	—	—	30	30
P. concinna (River cooter)	—	—	—	—	—	—	—	2	765	767
P. nelsoni (Florida red-bellied turtle)	—	—	—	—	—	—	—	—	100	100
Pyxidea mouhotii (Keeled box turtle)	—	—	—	—	32	78	350	135	532	1,127
Pyxis species (Malagasy spider tortoises)	—	—	—	—	—	—	—	—	14	14
P. arachnoides (Malagasy spider tortoises)	—	—	1	—	—	—	—	2	—	3
P. planicauda (Madagascar flat-shelled)	—	—	—	—	8	—	5	—	—	13
Rhinoclemmys species (Amer. turtles)	—	—	—	—	—	—	35	87	1,024	1,146
Sacalia species (Asiatic turtles)	—	—	—	—	—	—	—	—	168	168
Siebenrockiella crassicollis (Black marsh)	121	35	40	35	251	270	265	211	558	1,786
Staurotypus salvinii (Chiapas giant musk)	—	—	—	—	—	—	—	1	5	6
Staurotypus triporcatus (Mexican giant musk)	—	—	—	—	—	—	—	2	100	102
Sternotherus species (Musk turtles)	125	99	684	426	2,360	197	—	1	—	3,892
S. depressus (Flattened musk turtle)	—	—	—	—	100	—	—	—	—	100
Terrapene carolina (Common box turtle)	104	436	2,673	4,976	5,580	165	1	—	1	13,936
Terrapene coahuila (Coahuilan box turtle)	—	—	—	—	25	—	—	—	—	25
Terrapene ornata (Ornate box turtle)	—	—	50	933	2,062	396	—	—	2	3,443
Testudines (All turtles & tortoises)	22	624	1,041	518	736	—	1	—	12	2,954
Testudinidae (Land tortoises)	6	—	—	—	522	1,103	—	—	1	1,632
Testudo species (Land tortoises)	—	—	—	—	—	419	132	22	30	603
T. graeca (Spur-thighed tortoise)	856	1,510	765	1,553	3,647	3,309	2,754	363	3	14,760
T. hermanni (Hermann's tortoise)	750	14	34	184	299	56	4,004	9	4	5,354
T. horsfieldi (Central Asian tortoise)	16	10,016	—	2,983	5,435	11,301	5,204	310	7,868	43,133
T. kleinmanni (Egyptian tortoise)	27	11	165	300	20	1,898	754	—	—	3,175
T. marginata (Marginated tortoise)	34	10	21	21	—	9	—	—	—	95
Trachemys species (Slider turtles)	—	—	—	—	—	—	6	35	—	41
T. scripta elegans (Red-eared slider)	733,213	943,515	877,221	1,005,301	1,401,583	125,268	47	55	165,970	5,252,173
T. scripta callirostris (S. Amer. red-lined)	—	—	—	35,000	978	1	—	—	—	35,979
Trionyx species (Softshell turtles)	335	1,924	7,716	231	3,429	284	10,438	3	14	24,374
T. sinensis (Chinese softshell turtle)	—	—	—	—	—	—	—	—	10	10
T. triunguis (African softshell turtle)	1	10	3	6	—	—	10	6	—	36

Table 2. Live turtles and tortoises exported from the United States, 1989-1997.

Name	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Annamemys annamensis (Anam leaf turtle)	—	—	—	—	—	—	—	—	6	6
Apalone species (Softshell turtles)	—	—	—	—	—	—	7,368	4,543	5,487	17,398
A. (Trionyx) ferox (Florida softshell turtle)	—	—	—	—	—	—	1,900	1,877	7,781	11,558
A. mutica (Smooth softshell turtle)	—	—	—	—	—	—	—	5,187	200	5,387
A. spinifera (Spiny softshell turtle)	—	—	—	—	—	—	702	2,874	1,485	5,061
Carettochelys insculpta (Pig-nosed turtle)	—	—	—	—	—	—	—	—	2	2
Chelodina species (Snake & side-necked turtles)	—	—	—	—	—	—	—	60	10	70
C. longicollis (Common snake-necked turtle)	—	—	—	—	—	—	1	—	—	1
C. novaeguineae (New Guinea snake-necked)	—	—	—	—	—	—	2	—	—	2
C. siebenrocki (Siebenrock's side-necked turtle)	—	—	—	—	—	—	1	13	4	18
C. steindachneri (Steindachner's side-necked)	—	—	—	—	—	—	41	—	—	41
Chelonia mydas (Green sea turtle)	10	—	—	5	4	6	—	1	12	38
Cheloniidae (Hard shelled sea turtles)	—	—	—	—	1,500	52	—	—	—	1,552
Chelus fimbriatus (Matamata)	—	—	—	—	—	16	12	123	126	277
Chelydra serpentina (American snapping turtle)	—	23	660	5,149	9,254	18,422	31,563	18,668	17,730	101,469
Chersina angulata (S. African bowsprit tortoise)	—	10	5	13	7	20	—	—	8	63
Chinemys reevesii (Chinese 3-keeled pond turtle)	—	—	—	—	—	39	10	11	—	60
Chrysemys species (Painted turtles)	480	7,381	16,376	61,986	78,787	73,076	154,934	60,094	6,136	459,250
Chrysemys picta (Painted turtle)	—	—	—	—	—	—	3,750	26,434	24,546	54,730
Cistoclemmys species (Southeast Asian box turtle)	—	—	—	—	—	—	5	49	16	70
Clemmys species (North American turtles)	57	107	456	1,019	771	362	5,022	6,014	10	13,818
C. guttata (Spotted turtle)	—	—	—	—	3	284	259	131	553	1,230
C. insculpta (Wood turtle)	—	—	—	—	—	7	1	—	18	26
C. marmorata (Pacific Pond turtle)	—	—	—	—	—	3	420	18	—	441

Table 2. Live turtles and tortoises exported from the United States, 1989-1997 (cont.)

Name	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Cuora species (Asian box turtles)	—	8	283	820	577	400	102	33	—	2,223
C. amboinensis (Malayan box turtle)	—	—	—	—	42	233	426	85	60	846
C. flavomarginata (Yellow marginated turtle)	—	—	—	—	156	47	22	102	—	327
C. galbinifrons (Indochinese box turtle)	—	—	—	—	10	36	26	21	18	111
Cyclemys species (Leaf turtles)	—	—	—	—	—	—	4	2	1	7
*C. dentata (*Asian leaf turtle)	—	—	—	—	—	—	34	45	28	107
Deirochelys reticularia (Chicken turtle)	—	1	19	58	307	22	95	28	51	581
Elseya species (Australia/New Guinea snapping turtles)	—	—	—	—	—	—	—	—	5	5
Emydoidea blandingii (Blanding's turtle)	4	41	4	9	92	19	27	40	93	329
Emydura species (Short-necked side-necked turtles)	—	—	—	—	—	—	—	10	106	116
E. albertisii (Red-bellied short-necked turtle)	—	—	—	—	—	—	—	2	—	2
E. macquarrii (Murray river turtle)	—	—	—	—	—	—	20	6	—	26
Emys orbicularis (European pond turtle)	—	—	—	—	—	—	—	5	20	25
Geochelone species (Land tortoises)	—	—	—	—	—	2	120	14	20	156
G. carbonaria (S. American red-footed tortoise)	12	18	268	48	49	119	300	760	323	1,897
G. chilensis (Chaco tortoise)	30	—	—	—	—	—	32	—	—	62
G. denticulata (S. American yellow-footed)	10	28	46	57	34	104	268	129	69	745
G. elegans (Indian star tortoise)	—	1	1	3	—	—	6	—	2	13
G. elephantopus (Galapagos tortoise)	1	—	—	2	—	2	—	—	—	5
G. gigantea (Aldabra tortoise)	2	—	1	—	—	2	27	27	11	70
G. nigrita (Indefatigable tortoise)	—	—	—	—	—	—	2	—	2	4
G. pardalis (Leopard tortoise)	4	356	273	310	73	671	547	1,110	1,246	4,590
G. sulcata (African spurred tortoise)	6	12	61	120	807	1,016	2,071	3,506	3,746	11,345
Geoemyda species (Asian leaf turtles)	—	—	—	—	—	—	20	—	—	20
G. spengleri (Black breasted leaf turtle)	—	—	—	—	—	6	48	81	5	140
Gopherus berlandieri (Texas tortoise)	8	—	—	—	—	—	—	—	—	8
Gopherus polyphemus (Gopher tortoise)	—	—	—	—	1	—	—	—	—	1
Graptemys species (Map turtles)	673	4,573	8,695	20,378	37,233	56,749	46,429	61,023	53,105	288,858
G. barbouri (Barbour's map turtle)	—	—	—	—	—	—	—	142	747	889
G. caglei (Cagle's map turtle)	—	—	—	—	—	—	—	—	31	31
G. flavimaculata (Yellow-blotched map turtle)	—	—	—	—	—	—	—	50	—	50
G. geographica (common map turtle)	—	—	—	—	—	—	—	—	16,447	16,447
G. kohnii (Mississippi map turtle)	—	—	—	—	—	—	14,192	19,687	27,153	61,032
G. nigrinoda (Black-nobbed map turtle)	—	—	—	—	—	—	318	824	3,463	4,605
G. ouachitensis (Ouachita map turtle)	—	—	—	—	—	—	—	—	88	88
G. pseudogeographica (False map turtle)	—	—	—	—	—	—	—	—	2,729	2,729
G. versa (Texas map turtle)	—	—	—	—	—	—	—	—	98	98
Heosemys species (Asian forest & pond turtles)	—	—	—	—	—	—	—	10	19	29
H. spinosa (Spiny turtle)	—	—	—	—	2	2	44	2	5	55
Hieremys species (Temple turtles)	—	—	—	—	—	—	12	—	—	12
Homopus femoralis (Karroo cape tortoise)	—	—	—	—	—	1	—	—	—	1
Hydromedusa species (S. Amer. snake-necked turtle)	4	—	9	11	56	—	15	—	3	98
Indotestudo elongata (Elongated tortoise)	6	—	—	1	—	—	6	—	—	13
Indotestudo forsteni (Travancore tortoise)	—	—	—	—	4	5	—	15	3	27
Kinixys species (Hinge-back tortoises)	—	—	—	—	—	2	—	8	—	10
K. belliana (Bell's hinge-backed tortoise)	6	13	73	84	36	151	44	21	158	586
K. erosa (Serrated hinge-back tortoise)	3	11	—	4	—	—	—	—	—	18
K. homeana (Home's hinge-backed tortoise)	—	10	4	35	80	111	55	15	37	347
Kinosternon species (Mud turtles)	258	397	3,132	2,014	1,372	2,663	3,270	1,647	2,294	17,047
K. angustipons (Narrow-bridged mud turtle)	—	—	—	—	—	—	—	—	3	3
K. oaxacae (Oaxaca mud turtle)	—	—	—	—	—	—	—	—	5	5
Lissemys punctata (Indian flapshell turtle)	—	—	—	—	—	—	—	20	—	20
Macroclemys temminckii (Alligator snapping turtle)	290	382	1,761	2,039	2,101	4,477	2,138	11,331	11,763	36,282
Malaclemys species (Diamondback terrapins)	—	5	41	102	508	1,089	1,420	392	445	4,002
Malacochersus tornieri (Pancake tortoise)	6	—	242	145	297	—	6	5	4	705
Manouria emys (Asian brown tortoise)	1	—	—	—	—	—	3	1	29	34
Manouria impressa (Impressed tortoise)	—	—	—	—	—	—	—	—	43	43
Mauremys species (Turtles)	—	—	—	—	—	—	4	13	17	34
Pelomedusa subrufa (African helmeted)	36	20	—	252	50	3	51	—	20	432

Table 2. Live turtles and tortoises exported from the United States, 1989-1997 (cont).

Name	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Pelusios species (African mud turtles)	—	—	—	—	—	10	—	—	—	10
P. niger (W. African black forest turtle)	—	20	—	—	12	8	—	20	—	60
Phrynops species (S. American freshwater)	—	—	—	—	—	—	42	73	40	155
Phrynops hogei (Hoge's side-necked turtle)	—	—	—	—	—	—	1	—	—	1
Platemys species (S. Amer. Freshwater turtle)	—	—	16	6	56	97	38	19	28	260
Platysternon megacephalum (Big-headed turtle)	—	—	—	—	—	—	78	43	—	121
Podocnemis unifilis (Yellow-spotted Amaz. river)	—	6	—	—	—	—	—	—	—	6
Pseudemys species (Basking turtles)	—	—	—	—	—	—	2,409	14,368	33,899	50,676
P. alabamensis (Alabama red-bellied turtle)	—	—	5	—	20	—	—	—	—	25
P. concinna (River cooter)	—	—	—	—	—	—	6,110	19,289	25,023	50,422
P. floridana (Common cooter)	—	—	—	—	—	—	3,192	6,741	2,929	12,862
P. nelsoni (Florida red-bellied turtle)	—	—	—	—	—	—	16,648	17,111	12,215	45,974
P. rubriventris bangsi (Amer. red-bellied)	—	—	—	263	—	—	—	—	—	263
Pyxidea mouhotii (Keeled box turtle)	—	—	—	—	—	11	25	12	17	65
Pyxis species (Malagasy spider tortoises)	—	—	—	—	—	—	—	—	20	20
Rhinoclemmys species (American turtles)	—	—	—	—	—	—	112	105	800	1,017
Siebenrockiella crassicollis (Black marsh)	—	—	—	5	49	2	—	12	16	84
Staurotypus salvinii (Chiapas giant musk)	—	—	—	—	—	—	—	2	10	12
Staurotypus triporcatus (Mexican giant musk)	—	—	—	—	—	—	3	28	25	56
Sternotherus species (Musk turtles)	211	1,861	2,720	7,361	7,923	8,826	6,545	5,759	7,643	48,849
S. depressus (Flattened musk turtle)	—	—	146	20	25	—	—	—	24	215
S. odoratus (Common musk turtle)	—	—	—	—	—	—	163	1,705	4,370	6,238
Terrapene species (Box turtles)	—	—	—	—	—	—	500	—	—	500
T. carolina (Common box turtle)	588	2,621	6,594	21,717	18,919	22,209	6,173	301	—	79,122
T. carolina carolina (Eastern box turtle)	—	—	—	—	—	—	—	—	1	1
T. carolina major (Gulf coast box turtle)	—	—	—	—	—	—	200	—	—	200
T. ornata (Ornate box turtle)	—	—	238	5,920	8,138	12,240	60	—	2	26,598
Testudines (All turtles & tortoises)	9,000	—	578	—	1,057	6	—	—	—	10,641
Testudinidae (Land tortoises)	—	—	—	—	799	9	137	—	—	945
Testudo species (Land tortoises)	—	—	—	—	—	7	—	—	48	55
T. graeca (Spur-thighed tortoise)	24	61	—	298	158	191	255	383	11	1,381
T. graeca graeca (Spur-thighed tortoise)	—	—	—	—	—	—	—	—	10	10
T. hermanni (Hermann's tortoise)	—	—	—	3	27	—	—	16	40	86
T. horsfieldi (Central Asian tortoise)	—	195	30	122	152	36	70	301	418	1,324
T. kleinmanni (Egyptian tortoise)	—	—	—	—	—	172	2	—	2	176
T. marginata (Marginated tortoise)	12	—	—	—	1	—	—	2	—	15
Trachemys species (Slider turtles)	—	—	—	—	—	—	3,893	3,030	1,379	8,302
T. scripta callirostris (S. Amer. red-lined)	—	—	—	5,000	5,803	1,264	27,300	17	21	39,405
T. scripta elegans (Red-eared slider)	3,472,886	3,423,776	6,318,367	3,308,678	5,516,973	8,298,236	4,658,413	8,416,672	8,708,388	52,122,389
T. stejnegeri (Central antelean slider)	—	—	—	—	—	—	—	15	—	15
Trionyx species (Softshell turtles)	508	8,680	2,508	5,517	13,524	34,467	29,996	12,120	4,439	111,759
T. sinensis (Chinese softshell turtle)	—	—	—	—	—	—	—	—	35	35
T. spiniferus (E. spiny softshell turtle)	—	—	—	—	—	—	—	—	202	202
T. triunguis (African softshell turtle)	—	—	—	6	—	1	3	—	—	10

Table 3. Total imports and exports for the years, 1989-1997.

IMPORTS	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
Turtles and Tortoises	758,158	975,698	928,111	1,093,897	1,472,473	168,766	41,158	12,605	258,106	5,708,972
Lizards and Snakes	321,799	576,483	486,397	974,394	1,336,862	1,109,829	697,676	652,957	1,421,421	7,577,766
Crocodilians	2,645	2,064	371	4,138	12,082	6,766	3,163	11,150	17,153	59,532
Non-CITES Reptiles	1,009,622	1,588,982	779,891	781,613	467,032	217,506	122,453	39,453	19,571	5,026,123
Unknown Reptiles	1,879	649	2,215	9,333	104	536	297	—	73	15,096
Grand Total	2,094,103	3,143,876	2,196,985	2,863,375	3,288,553	1,503,403	864,747	716,165	1,716,324	18,387,489
EXPORTS										
Turtles and Tortoises	3,485,136	3,450,617	6,363,612	3,449,580	5,707,849	8,538,011	5,040,563	8,725,453	8,990,699	53,751,521
Lizards and Snakes	22,805	43,235	81,098	110,662	156,611	278,516	368,198	296,918	266,355	1,624,396
Crocodilians	724	1,340	49	3,981	7,745	1,913	5,346	31,621	20,209	72,928
Non-CITES Reptiles	734,361	434,547	364,065	390,624	99,348	110,150	161,623	104,023	27,921	2,426,662
Unknown Reptiles	3,480	655	836	781	3,277	557	—	—	4	9,590
Grand Total	4,246,506	3,930,394	6,809,660	3,955,628	5,974,830	8,929,147	5,575,730	9,158,015	9,305,188	57,885,097

Medical Issues Affecting the Rehabilitation of Asian Chelonians

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Non-sustainable exploitation of many species of Asian turtles has been well publicized in recent years. Many species that were considered common only five to ten years ago have now been listed as threatened or endangered by the International Union for the Conservation of Nature (IUCN). While habitat loss and collection for the pet trade have had some impact on these species, it is generally agreed that the most significant factor affecting populations at this time is over-consumption by Asian food markets. Recently, an IUCN Asian Turtle Workshop was held in Fort Worth, Texas to address the possibility of maintaining groups of many of these species in captivity as a short-term, partial solution to this crisis. Healthy founder animals are of major importance to the establishment of captive collections.

Most Asian turtles that become available to western researchers have been originally collected via networks of local people. These well-established networks have developed over many years and result in the movement of turtles over hundreds to thousand of miles en route to food markets. During this time, the turtles are often very crowded and deprived of food and water. Western researchers or reptile dealers may acquire specimens at various points along this trade route. Clearly, prolonged transit under poor conditions results in declining health of most specimens, such that most reach the western world in poor health.

In the past, attempts to establish many of these specimens in captivity have failed. While lack of natural history information and variable stress response of certain species may be a factor, it is becoming clear that failure to seriously address health issues of specimens may be the most common reason for failure. While this article is not designed to be an all-encompassing treatise and formulary for rehabilitating turtles, it is hoped that the general concepts addressed herein will assist veterinarians and researchers in establishing specific treatment plans. It is this author's opinion that most, if not all, Asian chelonians can benefit from veterinary examination and treatment as soon as possible after acquisition. Experience has shown that failure to promptly address medical issues often results in death of the specimen.

In general, newly acquired animals should be placed through a three to six month quarantine. During this time, the quarantined animals are isolated from established members of the collection while they are surveyed for the presence of contagious disease. Ideally, quarantine is carried out in a building separate from the healthy collection, or minimally, in a room separate from the healthy collection. All husbandry items including enclosures, water bowls, sponges, etc. from the quarantine room should not be mixed with the established collection; and waste from the quarantine room should not be disposed in proximity to the established collection. The quarantine room should be serviced after servicing the established collection. If new animals are to enter quarantine while animals nearing the end of quarantine are still present, subsets of quarantine (including new utensils, etc) should be established. Further recommendations for quarantine protocols are provided below.

Medical management of turtles must address environmental needs, nutritional support, and treatment of specific disease states. Obtaining as much natural history information as possible about the species of interest is necessary to provide a proper environment. For some species, this information is readily obtained, while for other poorly known species, this information may be unknown. In such cases, it may be necessary to provide the specimens with a range of environmental conditions to be modified based on the animals' response.

In devising captive environments, important factors include choice of enclosure, temperature, substrate, humidity, photoperiod, visual security, and presentation of water. In general, environments and enclosures for initial medical care and quarantine should be able to confine the specimens, provide appropriate water, heat, light, and humidity, and should be easy to clean and disinfect. Elaborate, naturalistic vivaria should not be used during this time, as it is impossible to appropriately monitor the specimens and eradicate contagious pathogens in such conditions. Specimens should be housed individually during quarantine if space permits. In general, plastic, glass, acrylic, or fiberglass enclosures are most useful. For terrestrial species, enclosures can be simply lined with newspaper or paper towels. For aquatic and semiaquatic species, water may be added to the desired depth with no substrate used. In either situation, the substrate or water should be discarded and the enclosure should be washed and disinfected daily. Warm water and liquid dish soap may be used to wash the enclosure, followed by disinfection with a dilute bleach solution (20 parts water to one part bleach), quaternary ammonium compound, or chlorhexidene solution. Enclosures should then be thoroughly rinsed. It is generally not recommended to rely on filtration to clean water during quarantine as pathogens may survive within the filter medium. An exception may exist where ultraviolet sterilizers are used with filtration.

Items provided within the enclosure should be kept to a minimum and should be easy to clean and disinfect. Shallow plastic trays work best for providing food and water for tortoises and semiaquatic species. These must be shallow enough and located prominently enough for specimens to know that food and water are present, and to be able to easily access it. Overturned plastic containers such as plastic flowerpots cut in half best provide visual security. Animals can hide under these as well as bask on them. All enclosure furnishings should be washed and disinfected daily.

Temperature requirements vary somewhat among species; but, as a rule, most Asian species do well during quarantine in temperature ranges of 80-84°F. Some montane aquatic species such a *Platysternon megacephalum* prefer much cooler temperatures. This may also be true of some forest species such as *Geomyda spengleri* which seem most comfortable at 75-80°F. If temperature requirements are unknown, a range of temperatures should be provided. Simple incandescent lights in reflector fixtures may provide basking areas for species that bask, but many forest species will avoid bright light. In general, most Asian species prefer high humidity. The ambient humidity of the quarantine room may be kept generally high (60-80%) and substrates may be moistened or sprayed daily. The role of full-spectrum lighting in chelonian husbandry is poorly investigated, but such lighting may be useful with some species. In general, a daylength of twelve to fourteen hours is appropriate. Under no circumstances should lights be left on continuously. Failure to provide darkness may lead to physiological stress that exacerbates other medical problems.

The vast majority of Asian turtles entering the U.S. are in poor nutritional status. Having possibly been deprived of food and water for weeks to months, they are often dehydrated and depleted of fat and muscle tissue. Within the first hours to days of treatment, rehydration of the specimens is vital. In some cases, simply placing an aquatic turtle in water, or placing a terrestrial species in a shallow pan of water will lead to voluntary drinking. In more severely dehydrated patients, balanced electrolyte solutions may be given by the subcutaneous or intracoelomic route. In general, most chelonians can tolerate roughly 20cc of fluid per kilogram per day. In very severely ill specimens, intraosseus or intravenous fluids may be needed. The importance of rehydration in restoring circulating blood volume, electrolytes, organ function, and immune response cannot be overemphasized.

In rare cases, Asian chelonians will begin feeding voluntarily within the first two to three days of acquisition. If this occurs, nutritional recovery is made much easier. In general, initial food offerings should be simply intended to stimulate food intake without tremendous concern over the nutritional value of the food items. For example, brightly colored fruits and vegetables such as strawberries, melon, or yellow squash may often tempt Indotestudo species. Omnivores such as *Pyxidea mouhouti* and carnivores such as *Platysternon* may be tempted by earthworms. If regular feeding is established, a wider variety of items may be offered in an attempt to establish a long-term complete diet. It is unusual, however, for nutritional recovery to progress so smoothly.

Many new acquisitions will refuse to feed or may cease feeding after initially seeming enthusiastic. In the latter case, it is possible that food entering the debilitated body led to the proliferation of bacteria, fungi, or parasites, or placed metabolic stresses on poorly functioning liver and kidney tissue. As a result, nutritional support must be provided, and must often be combined with other medical therapy as discussed below. It is possible to produce the condition known as refeeding syndrome if too much nutrition is provided too rapidly. In this situation, the body that has been chronically deprived of nutrition becomes metabolically deranged when calories are suddenly provided. To prevent this, it is best to first work on rehydrating the animal and then gradually increasing its food intake over the first week of rehabilitation.

Nutritional support for chelonians is generally provided by tube feeding. In most cases this is accomplished by passing a feeding tube via the mouth down the esophagus to the stomach. This technique can be performed repeatedly and safely but requires training and patience to master. In some very large specimens, tube feeding may be so difficult that placement of a pharyngostomy tube is more practical. These surgically placed feeding tubes can be left in place for months and allow for delivery of food and medications. For most Asian species, daily tube feeding is recommended until consistent voluntary feeding is achieved. The volume of food that can be fed at any one feeding varies; but, as a generality, animals can handle about 10ml per kilogram at each feeding. It is important to choose a tube feeding product that will not clog the tube and that is appropriate for the species. For herbivores, pureed vegetables, vegetable baby food, or vegetable-based health food supplements may be used. For carnivores, enteral supplements for humans, dogs, or cats may be used, as well as pureed dog or cat food or meat baby foods. For omnivores, a mix of these products should be used. If the patient easily tolerates once daily feeding, attempt to feed two or three times daily. Advanced techniques for nutritional support such as parenteral nutrition are being investigated.

After establishing a plan for environmental conditions, rehydration, and nutritional support, an attempt should be made to diagnose and treat specific medical problems of the specimens. There are two ways to approach this phase of treatment. The first, which is often used when large numbers of common animals are to be rehabilitated simultaneously, is to use pre-existing knowledge of the common medical problems of the species to make assumptions about what treatments will be needed and then applying these treatments to the entire group. The second, which is often used when small numbers of rare individuals are involved, is to use various diagnostic tests to specifically define an individual's medical condition such that treatment may be provided in a more specific manner. Each of these approaches to treatment has benefits and limitations. The group treatment approach has the benefit of being less expensive and more time- efficient as the animals can be treated in an "assembly-line" fashion. Its major limitation is that not all animals within the group will need all of the medications provided, and some may need medications that are not provided. Furthermore, when a good database of common disease problems is lacking for the species, as is the case with most Asian species, it is difficult to make correct assumptions about treatment. The more individualized approach has the benefit of tailoring a specific treatment to

a specific disorder, but has the drawback of the expense that may be necessary to define the problem and the time needed to provide different treatments to different animals. It is probably best that some aspects of both approaches are combined for specific situations.

A variety of diagnostic tests exist to help diagnose specific problems in chelonians. While a complete discussion of diagnostic testing is beyond the scope of this article, an elementary understanding of the available tests is important. A veterinarian that is familiar with the species of interest should perform a thorough physical examination of the animal. In addition to the obvious external features, a thorough oral exam and coelomic palpation should be performed. Fecal testing to identify intestinal parasites should also be performed routinely. Such testing may involve fecal floatation, fecal cytology, fecal wet mounts, special staining techniques, or assays such as immunofluorescent antibody tests. Such tests often reveal the presence of parasites such as nematodes, flagellated protozoans, and amoebae. Addressing these parasites is of great importance in successful rehabilitation. Blood chemistry analysis and cell counts may also be useful diagnostic tests in some cases. Unfortunately, these tests lack sensitivity and it is very possible to have "normal" results in a very ill specimen. Radiography (x-ray) may be useful in diagnosing some conditions such as pneumonia, retained eggs, bladder stones, and bone lesions; but is limited in its usefulness in diagnosing other serious abnormalities such as liver or kidney pathology. Techniques for isolation or detection of specific microorganisms are very useful. These may include bacterial and fungal cultures, PCR testing, and antibody testing for chelonian pathogens such as *Mycoplasma* and herpes virus. Newer diagnostic tests such as ultrasound, MRI, CT scan, and endoscopy may be useful although availability may be limited and expense may be prohibitive. Of these, endoscopy offers tremendous value as it allows, for the first time, direct visualization and tissue biopsy through relatively non-invasive means. Endoscopy may allow the early diagnosis of specific abnormalities and allow more accurate prognoses to be provided.

Most Asian chelonians that arrive in the U.S. are suffering from a variety of bacterial and parasitic infections. Some may also have viral or fungal infections. Based on necropsy results of many Asian chelonians, bacterial infections are extremely common and often are the cause of death. Infections most commonly damage the digestive system, liver, kidneys, and lungs. It appears that as a result of long transit, dehydration, and malnutrition, the turtles become immunocompromised and are susceptible to colonization by normal enteric flora. As is true in most reptiles, gram negative bacteria such as *Pseudomonas, Klebsiella, E. coli*, etc. are most commonly isolated. However, gram positive bacteria such as *Streptococcus* and anaerobic bacteria such as *Clostridium* may also be involved. It is reasonable to assume that, in almost all cases, antibiotic use is of benefit in Asian turtle rehabilitation. Where specific pathogens can be isolated, antibiotic choice is based on sensitivity testing. Where cultures are not done, it is reasonable to choose a drug or combination of drugs to cover gram negative, gram positive, and anaerobic organisms. The most common drugs used by the author are cefotaxime, chloramphenicol, trimethoprim sulfa, piperacillin, enrofloxacin, amikacin, and metronidazole. The length of treatment generally varies from three to six weeks depending on the severity of infection. Caution should be exercised to monitor for opportunistic fungal infections and maldigestion as a result of elimination of normal intestinal bacteria. It is unclear whether probiotic agents may help to prevent this problem. Doses of drugs are not provided herein, but should be determined by a veterinarian that is current on pharmacology of chelonians. Adverse reactions, drug interactions, and overdoses may occur if drugs are not used under professional guidance.

The second major group of drugs that is almost always needed in Asian turtle rehabilitation is parasiticides. Common medications that may be used include fenbendazole for nematodes and metronidazole for some protozoans. Amoebae may be a major pathogen in some cases and may be difficult to eradicate completely. Combinations of drugs are often needed to treat amoebiasis and may include metronidazole, iodoquinol, chloroquine, diloxanide, and paromomycin. Trematodes have been found in tissues of several Asian species and may respond to treatment with praziquantel. Long-term treatment (months) may be necessary to eradicate parasites. At least three negative fecal results should be obtained before releasing an animal from quarantine.

A wide range of other treatments including antifungal drugs, nebulization, and gastroprotectants may be needed to successfully rehabilitate Asian turtles. Such treatments are still under investigation and cannot be fully endorsed at this time.

In many cases, Asian chelonians die despite excellent and appropriate treatment. It is critical that investigators utilize the tissues of dead specimens to increase our knowledge of the species. Failure to perform a necropsy, collect tissues for histopathology, provide tissues for chelonian genetics research, and offer the cadaver to a museum collection represents a major loss of valuable information. Those working with Asian turtles on a regular basis should establish a routine for dissemination of this information to colleagues. Only by thorough tissue analysis have diseases such as intranuclear coccidiosis of tortoises been discovered. More diseases await discovery, and only by identifying these diseases will we be able to refine our treatment plans to achieve greater success.

Chelonian Research Foundation
Linnaeus Fund: 2000 Grant Recipients

ANDERS G.J. RHODIN

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Chelonian Research Foundation (CRF), established in 1992 as a 501(c)(3) nonprofit tax-exempt private operating foundation, administers a turtle research endowment fund named The Linnaeus Fund, for which it invites the submission of chelonian research proposals for its Annual Turtle Research Awards. Named after Carolus Linnaeus [1707–1778], the Swedish creator of binomial nomenclature, the fund honors the first turtle taxonomist and father of all modern systematics.

For its 9th Annual Linnaeus Fund Awards selection on 31 December 2000, CRF awarded a total of $10,000 divided among 7 research projects. Awards granted were as follows:

FORDHAM, DAMIEN. The impact Aboriginal harvest has on populations of the northern long-necked turtle (*Chelodina rugosa)*.

LAHANAS, PETER N.; AND ORDOÑEZ, CRISTINA. Sources of marine turtle mortality in the Bocas del Toro Archipelago, Panama.

LUBCKE, GLEN M.; AND WILSON, DAWN S. A comparison of movements, habitat use, and mortality rates in the western pond turtle (*Clemmys marmorata marmorata*) at two different study sites within Butte Co., California.

LUISELLI, LUCA. Conservation ecology of the threatened forest tortoises (genus *Kinixys*) in the Niger Delta, Nigeria: Phase 2. Population characteristics in areas under "traditional" conservation by religious beliefs.

PARHAM, JAMES FORD; SHI HAITAO; AND PAPENFUSS, THEODORE J. A study of turtle breeding facilities in Hainan Province and their implications for the conservation and systematics of Chinese turtles.

SCHWARTZ, TONIA S.; AND KARL, STEPHEN A. Population genetics of the gopher tortoise (*Gopherus polyphemus*) in Florida.

SPINKS, PHILLIP Q.; AND SHAFFER, H. BRADLEY. Molecular phylogeography of the western pond turtle (*Clemmys marmorata*) revisited.

Linnaeus Fund awards are granted annually to individuals for specific turtle research projects, with either partial or full support as funding allows. Priority is generally given to projects concerning freshwater turtles, but tortoise and marine turtle research proposals are also funded. Priority is given to the following general research areas: taxonomy and systematic relationships, conservation, distribution and zoogeography, ecology, natural history, and morphology, but other topics are also considered. Priority is given to projects that demonstrate potential relevance to the scientific basis and understanding of chelonian diversity and conservation biology. Award recipients agree to publish at least partial or summarized results of the supported research in a CRF-sponsored publication, such as Chelonian Conservation and Biology.

Awards at this time are typically in the $1000–$2000 range for each project, with about ten or more projects funded annually. There will be increased grant support from year to year as the endowment fund grows; it has a current value of over $150,000. The annual application deadline is November 15, with funding selection on December 31. Submit applications in formal grant proposal format in triplicate as follows: title page, project objective, background and research rationale, materials and methods, total project expenses, funding requested from CRF, funding available or requested from other organizations, general timetable, literature cited, and curriculum vitae for all key personnel. Full submission instructions and a listing of former grants awarded are provided on the CRF website at <www.chelonian.org>.

Awards are granted through an internal review process carried out by the Director and Scientific Advisory Board of CRF which includes Anders G.J. Rhodin, Russell A. Mittermeier, Peter C.H. Pritchard, John L. Behler, Terry E. Graham, Kurt A. Buhlmann, and Jeanette Wyneken. Submit applications to the author.

LEGAL ISSUES

US Regulations on the Trade of Turtles Less than Four Inches

[Code of Federal Regulations]
[Title 21, Volume 8, Parts 800 to 1299]
[Revised as of April 1, 2000]
From the U.S. Government Printing Office via GPO Access
[CITE: 21CFR1240.62]
[Page 647-649]

TITLE 21—FOOD AND DRUGS
SERVICES—(Continued)
PART 1240—CONTROL OF COMMUNICABLE DISEASES
—Table of Contents
Subpart D—Specific Administrative Decisions Regarding Interstate Shipments

Sec. 1240.62 Turtles intrastate and interstate requirements.

(a) Definition. As used in this section the term "turtles" includes all animals commonly known as turtles, tortoises, terrapins, and all other animals of the order Testudinata, class Reptilia, except marine species (families Dermochelyidae and Cheloniidae).

(b) Sales; general prohibition. Except as otherwise provided in this section, viable turtle eggs and live turtles with a carapace length of less than 4 inches shall not be sold, held for sale, or offered for any other type of commercial or public distribution.

(c) Destruction of turtles/turtle eggs; criminal penalties.

(1) Any viable turtle eggs or live turtles with a carapace length of less than 4 inches which are held for sale or offered for any other type of commercial or public distribution shall be subject to destruction in a humane manner by or under the supervision of an officer or employee of the Food and Drug Administration in accordance with the following procedures:

(i) Any District Office of the Food and Drug Administration, upon detecting viable turtle eggs or live turtles with a carapace length of less than 4 inches which are held for sale or offered for any other type of commercial or public distribution, shall serve upon the person in whose possession such turtles or turtle eggs are found a written demand that such turtles or turtle eggs be destroyed in a humane manner under the supervision of said District Office, within 10 working days from the date of promulgation of the demand. The demand shall recite with particularity the facts which justify the demand. After service of the demand, the person in possession of the turtles or turtle eggs shall not sell, distribute, or otherwise dispose of any of the turtles or turtle eggs except to destroy them under the supervision of the District Office, unless and until the Director of the Center for Food Safety and Applied Nutrition withdraws the demand for destruction after an appeal pursuant to paragraph (c)(1)(ii) of this section.

(ii) The person on whom the demand for destruction is served may either comply with the demand or, within 10 working days from the date of its promulgation, appeal the demand for destruction to the Director of the Center for Food Safety and Applied Nutrition, Food and Drug Administration, 200 C St. SW., Washington, DC 20204. The demand for destruction may also be appealed within the same period of 10 working days by any other person having a pecuniary interest in such turtles or turtle eggs. In the event of such an appeal, the Center Director shall provide an opportunity for hearing by written notice to the appellant(s) specifying a time and place for the hearing, to be held within 14 days from the date of the notice but not within less than 7 days unless by agreement with the appellant(s).

(iii) Appearance by any appellant at the hearing may be by mail or in person, with or without counsel. The hearing shall be conducted by the Center Director or his designee, and a written summary of the proceedings shall be prepared by the person presiding. Any appellant shall have the right to hear and to question the evidence on which the demand for destruction is based, including the right to cross-examine witnesses, and he may present oral or written evidence in response to the demand.

(iv) If, based on the evidence presented at the hearing, the Center Director finds that the turtles or turtle eggs were held for sale or offered for any other type of commercial or public distribution in violation of this section, he shall affirm the demand that they be destroyed under the supervision of an officer or employee of the Food and Drug Administration; otherwise, the Center Director shall issue a written notice that the prior demand by the District Office is withdrawn. If the Center Director affirms the demand for destruction he shall order that the destruction be accomplished in a humane manner within 10 working days from the date of the promulgation of his decision. The Center Director's decision shall be accompanied by a statement of the reasons for the decision. The decision of the Center Director shall constitute final agency action, reviewable in the courts.

(v) If there is no appeal to the Director of the Center for Food Safety and Applied Nutrition from the demand by the Food and Drug Administration District Office and the person in possession of the turtles or turtle eggs fails to destroy them within 10 working days, or if the demand is affirmed by the Director of the Center for Food Safety and Applied Nutrition after an appeal and the person in possession of the turtles or turtle eggs fails to destroy them within 10 working days, the District Office shall designate an officer or employee to destroy the turtles or turtle eggs. It shall be unlawful to prevent or to attempt to prevent such destruction of turtles or turtle eggs by the officer or employee designated by the District Office. Such destruction

will be stayed if so ordered by a court pursuant to an action for review in the courts as provided in paragraph (c)(1)(iv) of this section.

(2) Any person who violates any provision of this section, including but not limited to any person who sells, offers for sale, or offers for any other type of commercial or public distribution viable turtle eggs or live turtles with a carapace length of less than 4 inches, or who refuses to comply with a valid final demand for destruction of turtles or turtle eggs (either an unappealed demand by an FDA District Office or a demand which has been affirmed by the Director of the Center for Food Safety and Applied Nutrition pursuant to appeal), or who fails to comply with the requirement in such a demand that the manner of destruction be humane, shall be subject to a fine of not more than $1,000 or imprisonment for not more than 1 year, or both, for each violation, in accordance with section 368 of the Public Health Service Act (42 U.S.C. 271).

(d) Exceptions. The provisions of this section are not applicable to:

(1) The sale, holding for sale, and distribution of live turtles and viable turtle eggs for bona fide scientific, educational, or exhibitional purposes, other than use as pets.

(2) The sale, holding for sale, and distribution of live turtles and viable turtle eggs not in connection with a business.

(3) The sale, holding for sale, and distribution of live turtles and viable turtle eggs intended for export only, provided that the outside of the shipping package is conspicuously labeled "For Export Only."

(4) Marine turtles excluded from this regulation under the provisions of paragraph (a) of this section and eggs of such turtles.

(e) Petitions. The Commissioner of Food and Drugs, either on his own initiative or on behalf of any interested person who has submitted a petition, may publish a proposal to amend this regulation. Any such petition shall include an adequate factual basis to support the petition, and will be published for comment if it contains reasonable grounds for the proposed regulation. A petition requesting such a regulation, which would amend this regulation, shall be submitted to the Dockets Management Branch, Food and Drug Administration, rm. 1-23, 12420 Parklawn Dr., Rockville, MD 20857.

[40 FR 22545, May 23, 1975, as amended at 46 FR 8461, Jan. 27, 1981; 48 FR 11431, Mar. 18, 1983; 54 FR 24900, June 12, 1989; 59 FR 14366, Mar. 28, 1994]

US Regulation on Importing Turtles under Four Inches

[Code of Federal Regulations]
[Title 42, Volume 1, Parts 1 to 399][Revised as of Oct. 1, 2000]
From the U.S. Government Printing Office via GPO Access
[CITE: 42CFR71.52] [Page 526]
TITLE 42—PUBLIC HEALTH
CHAPTER I—Public Health Service, Dept. of Health and Human Services
PART 71—FOREIGN QUARANTINE—Table of Contents
Subpart F—Importations

Sec. 71.52 Turtles, tortoises, and terrapins.

(a) Definitions. As used in this section the term: Turtles includes all animals commonly known as turtles, tortoises, terrapins, and all other animals of the order Testudinata, class Reptilia, except marine species (Families Dermochelidae and Cheloniidae).

(b) Importation; general prohibition. Except as otherwise provided in this section, live turtles with a carapace length of less than 4 inches and viable turtle eggs may not be imported into the United States.

(c) Exceptions.

(1) Live turtles with a carapace length of less than 4 inches and viable turtle eggs may be imported into the United States, provided that such importation is not in connection with a business, and the importation is limited to lots of fewer than seven live turtles or fewer than seven viable turtle eggs, or any combinations of such turtles and turtle eggs totaling fewer than seven, for any entry.

(2) Seven or more live turtles with a carapace length of less than 4 inches, or seven or more viable turtle eggs or any combination of turtles and turtle eggs totaling seven or more, may be imported into the United States for bona fide scientific or educational purposes or for exhibition when accompanied by a permit issued by the Director.

(3) The requirements in paragraphs (c)(1) and (c)(2) of this section shall not apply to the eggs of marine turtles excluded from these regulations under Sec. 71.52(a).

(d) Application for permits. Applications for permits to import turtles, as set forth in paragraph (c)(2) of this section, shall be made by letter to the Director, and shall contain, identify, or describe, the name and address of the applicant, the number of specimens, and the common and scientific names of each species to be imported, the holding facilities, the intended use of the turtles following their importation, the precautions to be undertaken to prevent infection of members of the public with Salmonella and Arizona bacteria, and any other information and assurances the Director may require.

(e) Criteria for issuance of permits. A permit may be issued upon a determination that the holder of the permit will isolate or otherwise confine the turtles and will take such other precautions as may be determined by the Director to be necessary to prevent infection of members of the public with Salmonella and Arizona bacteria and on condition that the holder of the permit will provide such reports as the Director may require.

(f) Interstate Regulations. Upon admission at a U.S. Port, turtles and viable turtle eggs become subject to Food and Drug Administration Regulations (21 CFR 1240.62) regarding general prohibition.

(g) Other permits. Permits to import certain species of turtles may be required under other Federal regulations (50 CFR parts 17 and 23) protecting such species.

(Approved by the Office of Management and Budget under control number 0920-0134)

Editors' note: It is OK to export all kinds of turtles and eggs from the United States IF you have the right permit and they are not protected by any laws such as CITES or ESA.

Request for Information and Recommendations on Species To Consider for Changes to the CITES Appendices

[Federal Register: June 12, 2001 (Volume 66, Number 113)]
[Notices] [Page 31686-31690]
From the Federal Register Online via GPO Access
Department of the Interior, Fish and Wildlife Service
AGENCY: Fish and Wildlife Service, Interior.
ACTION: Request for information.

SUMMARY: In order to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Parties to the Treaty periodically meet to review which species in international trade should be regulated, and other aspects of implementation of the treaty. We have been informed that the twelfth meeting of the Conference of the Parties to CITES (COP12) will be held in November 2002, in Santiago, Chile. We are, therefore, soliciting recommendations for amending Appendices I and II of CITES at COP12. We invite information and comment from the public on animal and plant species that should be considered as candidates for U.S. proposals to amend CITES Appendix I or II. Such amendments may concern the addition of species to Appendix I or II, the transfer of species from one Appendix to another, or the removal of species from Appendix II. We are also seeking information and comment from the public on the biological and trade status of selected species identified at the end of this notice.

DATES: We will consider all information and comments received by **August 13, 2001.**

ADDRESSES: Send correspondence concerning this request pertaining to species amendments to: Chief, Division of Scientific Authority; U.S. Fish and Wildlife Service; 4401 North Fairfax Drive, Room 750; Arlington, Virginia 22203-1610, or via E-mail to: fw9ia—dsa@fws.gov. Comments and materials received will be available for public inspection by appointment from 8 a.m. to 4 p.m., Mon.-Fri., at the Division of Scientific Authority.

FOR FURTHER INFORMATION CONTACT: Dr. Susan Lieberman, Chief, Division of Scientific Authority, phone 703-358-1708, fax 703-358-2276, E-mail: fw9ia_dsa@fws.gov.

SUPPLEMENTARY INFORMATION:

Background

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, (hereinafter referred to as CITES or the Convention), is an international treaty designed to control and regulate international trade in certain animal and plant species that are now or potentially may become threatened with extinction. These species are listed in the Appendices to CITES. You may obtain copies of the list of CITES species, and the text of the treaty, from the Division of Scientific Authority at the above address, from our web site http://international.fws.gov/, or from the official CITES Secretariat web site at http://www.cites.org/.

Currently 152 countries, including the United States, are Parties (i.e., a country that has acceded to the treaty) to the Convention. The treaty states that a biennial meeting of the Conference of the Parties will be held to consider amendments to the list of species in Appendices I and II, review issues pertaining to CITES implementation, make provisions enabling the CITES Secretariat in Switzerland to carry out its functions, consider reports presented by the Secretariat, and make recommendations for the improved effectiveness of CITES. Any country that is a Party to CITES may propose and vote on amendments to Appendices I and II (species proposals), resolutions, decisions, discussion papers, and agenda items for consideration at biennial meetings of the Conference of the Parties. The text of any proposal must be submitted to the CITES Secretariat at least 150 days before the meeting. The Secretariat must then consult the other Parties and appropriate intergovernmental agencies, and communicate their responses to all Parties no later than 30 days before the meeting.

This is the first in a series of Federal Register notices that, together with announced public meetings, provide an opportunity for the public to participate in the development of the United States negotiating positions for the twelfth regular meeting of the Conference of the Parties to CITES (COP12). Our regulations governing this public process are found in 50 CFR 23.31-23.39. We have been informed that COP12 will be held in November 2002, in Santiago, Chile.

Request for Information and Comments

One of the purposes of this first notice is to solicit information that will help us identify species that the United States should propose as candidates for addition, removal, or reclassification in the CITES Appendices, or to identify issues warranting attention by the CITES Nomenclature Committee. This request is not limited to species occurring in the United States. Any Party may submit proposals concerning animal or plant species occurring in the wild anywhere in the world. We encourage the submission of information on species for possible inclusion in the Appendices if these species are subject to international trade

that may be detrimentally impacting the status of the species. Complete proposals are not being requested at this time, but are always welcome. Rather, we are asking interested persons to submit convincing information describing: (1) The status of the species, especially trend information; (2) conservation and management programs for the species, including the effectiveness of enforcement efforts; and (3) the level of domestic as well as international trade in the species, especially trend information. Any other relevant information can also be provided. References are appreciated.

The term "species" is defined in CITES as "any species, subspecies, or geographically separate population thereof." Each species for which trade is controlled is included in one of three Appendices, either as a separate listing or incorporated within the listing of a higher taxon. The basic standards for inclusion of species in the Appendices are contained in Article II of CITES. Appendix I includes species threatened with extinction that are or may be affected by trade. Appendix II includes species that, although not necessarily now threatened with extinction, may become so unless trade in them is strictly controlled. Appendix II also lists species that must be subject to regulation in order that trade in other CITES-listed species may be brought under effective control. Such listings frequently are required because of difficulty in distinguishing specimens of currently or potentially threatened species from other species at ports of entry. Appendix III includes species that any Party country identifies as being subject to regulation within its jurisdiction for purposes of preventing or restricting exploitation and for which it needs the cooperation of other Parties to control trade. Since species are listed in Appendix III unilaterally by any country, we are not seeking input on possible U.S. Appendix-III listings in this Notice.

CITES specifies that international trade in any readily recognizable part or derivative of animals listed in Appendix I or II, or plants listed in Appendix I, is subject to the same conditions that apply to trade in the whole organism. With certain standard exclusions formally approved by the Parties, the same applies to the readily recognizable parts and derivatives of most plant species listed in Appendix II. Parts and derivatives usually not included (i.e., not regulated) for Appendix-II plants are: Seeds, spores, pollen (including pollinia), and seedling or tissue cultures obtained in vitro and transported in sterile containers. You may refer to 50 CFR 23.23(d), and the October 6, 1995, Federal Register (60 FR 52450) and February 22, 1996, Federal Register (61 FR 6793) for further exceptions and limitations.

In 1994, the CITES Parties adopted criteria for inclusion of species in Appendices I and II (in Resolution Conf. 9.24). These criteria apply to all listing proposals and are available from CITES Secretariat web site (www.cites.org/), or upon request from the Division of Scientific Authority. Resolution Conf. 9.24 also established a format for complete proposals.

What Information Should Be Submitted?

In response to this Notice, to provide us information on species subject to international trade for possible proposals to amend the Appendices, please include as much of the following information as possible in your submission:

(1) Scientific name and common name;
(2) Population size estimates (with references if available);
(3) Population trend information;
(4) Threats to species status (other than from trade);
(5) Level/trend of international trade (as specific as possible but without a request for new searches of Service records);
(6) Level/trend in total take from the wild (as specific as reasonable); and
(7) Short summary statement clearly presenting the rationale for inclusion in or delisting from one of the Appendices, including which of the criteria in Resolution Conf. 9.24 are met.

If you wish to submit more complete proposals for us to consider, please consult Resolution Conf. 9.24 for the format for proposals and a detailed explanation of each of the categories. Proposals to transfer a species from Appendix I to Appendix II, or to remove a species from Appendix II, must also be in accordance with the precautionary measures described in Annex 4 of Resolution Conf. 9.24. If you have information and comments on species that are potential candidates for CITES proposals, we encourage you to contact our Division of Scientific Authority.

What Will We Do With the Information We Receive?

One important function of the CITES Scientific Authority of each country is the monitoring of international trade in plant and animal species, and ongoing scientific assessments of the impact of that trade on species. For native U.S. species, we monitor trade and export permits we authorize, to be assured that trade remains sustainable (for Appendix-II species). We also work closely with our States, to be assured that species are correctly listed in the CITES Appendices (or not listed, if a listing is not warranted). We actively seek information about U.S. and foreign species subject to international trade. The information submitted will help us monitor trade and its impact, as well as help us decide if we should submit or co-sponsor a proposal to amend the CITES Appendices. However, there may be species that qualify for CITES listing for which we decide not to submit a proposal to COP12. Our decision will be based on a number of factors, including scientific and trade information, whether or not the species is native to the United States and, for foreign species, whether or not a proposal is supported or co-sponsored by at least one range country for the species. We will consult range countries for foreign species, and for species we share with other countries, subsequent to receiving and analyzing the information provided by the public. The lists that follow includes species that we are considering based on our monitoring efforts since COP11. Proposals for some of the species on this list were submitted or co-sponsored by the United States at COP11, but were not adopted for a number of reasons. We encourage the submission by the public of any new scientific or trade information on these species so that we can decide if we will or will not re-submit proposals for them. Including a species here does not mean that we will

necessarily submit a proposal for it. For native U.S. species, we will share information provided to us with the States, to assist them with their management of the species, and to enable a productive State-Federal dialogue on whether or not CITES listing would assist the States in the conservation of these species.

There may be species which meet the criteria for CITES Appendix I or II but do not appear in the lists below because of inadequate or anecdotal information in our records. We will continue to consult with other Federal and State agencies, academia, the public, and other countries to obtain information on additional species that may qualify for CITES listing and will report our findings in subsequent Federal Register notices prior to COP12.

What Species are We Considering for Proposals, and for Which Species are We Requesting Additional Information?

Animals (note: only reptiles have been reprinted here)

We solicit information on the biological and trade status of the taxa in Table 1, and whether or not they meet the CITES criteria for listing in Appendix II.

We solicit information on the biological and trade status of the following species (Table 2), and whether or not they meet the CITES criteria for removal from Appendix II.

We solicit information on the biological and trade status of the reptile taxa in Table 3, and whether or not they meet the CITES criteria for transfer to or listing in Appendix I.

Editors' note: For the plant listings and other animal species please refer to the original Federal register announcement.

Table 1. Information is being solicited on the reptiles below for listing in Appendix II. The following abbreviations are used in the following 3 tables: over-harvest, o-h; pet, P; skin, S; food, F; international, I; and trade, T.

Species or taxon	Range	Rationale
Crotalus horridus (timber rattlesnake)*	U.S.A	Possible o-h for S and P T.
Crotalus adamanteus (eastern diamondback rattlesnake)		
	Eastern U.S.A	Potential for periodic o-h for S T.
Lampropeltis zonata (mountain kingsnake)	California, USA	Possible o-h for P T; similarity of appearance issues.
Clemmys guttata (spotted turtle)**	U.S.A	Possible o-h for P T and export.
Apalone spinifera, A. mutica, A. ferox (North American softshell turtles)		
	U.S.A	Possible o-h for I F T.
Asian freshwater turtles and tortoises (e.g., *Chitra* spp., *Carettochelys insculpta, Chinemys* spp., *Heosemys* spp., *Mauremys* spp., *Amyda cartilagina, Kachuga* spp., *Orlitia borneensis, Pyxidea mouhotii, Chelodina* spp., *Pelochelys* spp.)		
	Asia	O-h for I F and P T, and similarity of appearance issues.

*Proposed at COP 11, but withdrawn.

**Proposed at COP 11, but not adopted.

Table 2. Biological and trade status is being solicited on the following Appendix II listed reptiles. This information will be used to determine if they meet the criteria for removal from Appendix II.

Species or Taxon	Range	Rationale
Cnemidophorus hyperythrus (orange-throated whiptail lizard)	U.S.A.	Little I T and threat to species in the wild.

Table 3. Biological and trade status is being solicited for the following reptile taxa, and whether or not they meet the CITES criteria for transfer to or listing in Appendix I.

Species or taxon	Range	Rationale
Asian freshwater turtles and tortoises (e.g., *Callagur borneoensis, Chelodina mccordi, Chitra chitra, Cuora* spp., *Geochelone platynota, Heosemys yuwonoi, Manouria* spp.).		
	Asia	O-h for I F and P T, and similarity of appearance issues.
Chamaeleo (=*Calumma*) *parsonii* (Parson's chameleon).		
	Madagascar	Possible o-h for I P T.
Pyxis spp. (Madagascar spider tortoises)	Madagascar	O-h for I P T.
Erymnochelys madagascariensis (Madagascar big-headed turtle)		
	Madagascar	O-h for I P T.
Corucia zebrata (skink)	Solomon Isl., Solomon Islands	O-h for I P T.
Uromastyx spp. (spiny-tailed lizards)	Africa	O-h of some species for I P T.

Maryland Governor Glendening Establishes a Diamondback Terrapin Task Force

EXECUTIVE ORDER 01.01.2001.05
Maryland Diamondback Terrapin Task Force

WHEREAS, The perpetuation of Maryland's beloved icon and official State reptile, the Maryland Diamondback Terrapin (*Malaclemys terrapin*) depends on concerted conservation efforts;

WHEREAS, Accurate biological data are needed to establish population estimates and institute management strategies which will help ensure continued progress in the protection and repatriation of the Maryland Diamondback Terrapin species in Maryland; and

WHEREAS, Coincident with the data collection effort, interim management strategies may be required to minimize further risk to Maryland's Diamondback Terrapin population.

NOW, THEREFORE, I, PARRIS N. GLENDENING, GOVERNOR OF THE STATE OF MARYLAND, BY VIRTUE OF THE AUTHORITY VESTED IN ME BY THE CONSTITUTION AND THE LAWS OF MARYLAND, HEREBY PROCLAIM THE FOLLOWING EXECUTIVE ORDER, EFFECTIVE IMMEDIATELY:

A. Established. A Maryland Diamondback Terrapin Task Force is hereby established to evaluate current population data and management practices for Maryland Diamondback Terrapins and recommend interim strategies to protect and preserve the species prior to the completion of a more comprehensive population study and management plan.

B. Membership and Procedures.

(1) The Task Force shall consist of up to nine members, including:

(a) A member of the Maryland State Senate appointed by the President of the Senate;

(b) A member of the Maryland House of Delegates appointed by the Speaker of the House of Delegates; and

(c) Up to seven members appointed by the Governor, who have interest or expertise in animal welfare and/or Terrapin conservation, including a student and educator involved in the "Terrapin Station" initiative sponsored by the Department of Natural Resources.

(2) The Governor shall designate a Chairperson from among the members of the Task Force.

(3) A member may not receive compensation for serving on the Task Force, but may be reimbursed for expenses incurred in the conduct of duties under this Executive Order, in accordance with the Standard State Travel Regulations and as provided for in the State budget.

C. Scope. The Task Force shall have the following responsibilities:

(1) Analyze and interpret data concerning current and future population trends of the Maryland Diamondback Terrapin.

(2) Assess current management practices and, based on the results of the population data analysis, make recommendations for more effective, long-term strategies for conservation and repatriation of the Maryland Diamondback Terrapin.

(3) Propose and assist the Department of Natural Resources in implementing interim measures to minimize further risk to the Maryland Diamondback Terrapin population while the comprehensive population study is in progress.

D. Report. On or before October 1, 2001, the Task Force shall complete its work and submit a final report of its findings and recommendations to the Secretary of the Department of Natural Resources.

E. The Department of Natural Resources shall provide staff support to the Task Force.

GIVEN Under My Hand and the Great Seal of the State of Maryland, in the City of Annapolis, this 4th Day of April, 2001.

Parris N. Glendening, Governor

ATTEST: John T. Willis, Secretary of State

Further Information on the Diamondback Terrapin Task Force

Marguerite Whilden, Secretary, Governor's Terrapin Task Force
Fisheries Conservation and Stewardship Program, Department of Natural Resources
580 Taylor Avenue, Annapolis, Maryland 21401
Ph: 410 260-8269; E-mail mwhilden@dnr.state.md.us; http:// www.dnr.state.md.us/terrapin

The Maryland Diamondback Terrapin Task Force, is charged with studying current and future population trends of the Diamondback Terrapin and recommending measures to protect the species. The Governor also announced the Department of Natural Resources will fund ongoing Diamondback Terrapin research.

The Governor has appointed nine members to the Maryland Diamondback Terrapin Task Force, including Maryland Delegate Virginia Clagett, Maryland Senator Paul Pinsky, an educator, a student, a commercial waterman, a representative of the animal welfare community, an expert in the terrapin ecology, and an expert in terrapin habitat restoration. The task force is chaired by William Moulden and will examine current management practices for the terrapin and recommend measures needed to minimize further risk to the turtle and its habitat. Kevin Smith, David Lee, and Dr. Bill Boyd are serving as advisors to the Task Force, in addition to the members selected by the Governor. A report of its findings will be submitted by the task force to the Secretary of the Department of Natural Resources by October 1, 2001. For further information please contact the author. Posted April 4, 2001 .

ORGANIZATIONS

Homopus Research Foundation

Victor Loehr
(chairman Homopus *Research Foundation)*
Nipkowplein 24, 3402 EC IJsselstein, Netherlands
Email: loehr@homopus.org

Since 1995, a number of activities related to tortoises of the genus *Homopus* have been carried out, within the Studbook Breeding Programme *Homopus*. Initially the program was started for the coordination of studbooks (captive breeding projects) on *Homopus*, under the auspices of the European overall studbook foundation known as 'Stichting Overkoepelend Orgaan Stamboeken' (SOOS). However, over time the number of activities not directly related to studbook keeping, such as conducting scientific work within the captive populations and even fieldwork, increased. Therefore it was decided to condense all activities into a new, broader organization, named the *Homopus* Research Foundation. Another reason for the new foundation is that its non-profit, tax-exempt status facilitates receipt of donations from third parties.

The current studbooks on *Homopus areolatus* and *H. s. signatus* are among the activities carried out within the new foundation. These studbooks will also remain under auspices of the overall foundation SOOS.

Additional information about the *Homopus* Research Foundation can be found on the Internet site of the foundation, http://www.homopus.org.

Turtle Homes

Lori Green
P.O. Box 297, Merrick, NY 11566
Email Lori@TurtleHomes.org

Turtle Homes, a non-profit corporation in the state of New York, organizes the rescue and adoption of chelonian species. Turtle Homes advocates the welfare and conservation of turtles and tortoises through action and education. We have completed nearly 400 individual rescues since our inception in the summer of 1999. Turtles and tortoises for adoption to prescreened homes come from the public, college biology labs, wildlife refuge centers, Fish and Wildlife seizures, and wills. For information about adopting, contact Lori Green, Director of Turtle Homes (Lori@TurtleHomes.org).

Turtle Homes offers more than adoption and rescue. People new at keeping turtles and tortoises can request a Turtle Homes Mentor to privately answer all their questions. Additionally, we invite the public to volunteer with us, working on varied special projects. Both these programs are managed by Steven Stover (Steven@turtlehomes.org).

Michael Nesbit (Mike@TurtleHomes.org) and Barbara Bonner, DVM (turtlehosp@erols.com) head up Turtle Homes Asia. Their Asian Breeding Loan Program helps to form breeding colonies for a wide variety of Asian turtles. Through this program, we have loaned more than twenty Asian CITES I and II turtles to date, doing our part to mitigate the growing Asian Turtle crises.

We staff educational booths at reptile expos around the United States and invite you to introduce yourselves to us when you can attend.

Marissa Armour (zooglet@yahoo.com) coordinates the Turtle Homes Participating Organizations, a national network of similar organizations that work to benefit turtles and tortoises. She answers public relations questions.

To donate to Turtle Homes, please contact our treasurer, Howard Green (Howard@turtlehomes.org). In Canada, write to Scott Gillingwater (agrionemys@hotmail.com) and in the United Kingdom, please write to Andy Highfield (ttrust@globalnet.co.uk)

For more information visit www.TurtleHomes.org or write to P.O. Box 297, Merrick, NY 11566.

Northern Ohio Association of Herpetologists (NOAH)

Matt Reno

NOAH is the largest orginization in Ohio for people interested in keeping and breeding reptiles and amphibians. We run NoahOnline, which contains almost every article that our newsletters have had since 1996 (over 500 if you count). We are active in the policy creation process with the Ohio Department of Natrual Resources and have worked closely with them on their new law regulating the captive care of Reptiles and Amphibians native to Ohio. Visit our site at http://www.noahonline.net

Editors' Note: Their Newsletter (Notes from NOAH) is excellent.

BOOK REVIEW

Turtles of Borneo and Peninsular Malaysia by Lim Boo Liat and Indraneil Das. 1999. Natural History Publications (Borneo), 8.75 x 6.25 in., xii + 151 pp. Hardcover/DJ, U.S. Price: $40-$45

Review by John P. Levell
NorthStar Herpetological Associates - Turtle and Tortoise Book Shop; P.O. Box 389; Lanesboro, MN 55949-0389; USA; emys@acegroup.cc.

While by no means brand new, *Turtles of Borneo and Peninsular Malaysia* by Lim Boo Liat and Neil Das has only recently become widely distributed in the United States. While this in itself makes a review of the volume appropriate, growing concerns over the conservation status of all of Asia's turtles and tortoises makes the current availability of this volume most fortuitous indeed. In fact, as things stand right now, it is difficult to imagine there will be an overabundance of available publications on Asian chelonians anytime soon.

Be that as it may, that this is one nice little book is likely to be the immediate thought of anyone seeing this volume for the first time. This is due in large part to the well-designed and attractive dust jacket, which features excellent color photographs of the Asian brown tortoise, *Manouria emys*, on the front and rear panels. The fact that neither one of these two cover photos have been duplicated elsewhere within the book also adds a utilitarian aspect to the jacket that is typically absent in the wrappers of most other publications.

A cursory examination of the book's interior will likewise only further enhance the overall impression of quality. The hardcover binding is sound; the text is clean, well organized, and neatly formatted; and everything from beginning to end is printed on one of the finest grades of glossy paper available anywhere. Most eye appealing of all, the 163 pages are literally crammed full of exceptional color photographs.

Totaling 95 in number, these color photos are perhaps the book's strongest facet particularly since quality color illustrations of Asian turtles are currently so few and far between. Virtually all are crisp, clear, well composed and reproduced at a generous size; many must be ranked among the most stunningly beautiful chelonian photos ever published. The photos are further supplemented with a color map and 3 or 4 well executed b/w drawings. Indeed, about the only conceivable criticism that might be directed at the volume's illustrations, is that only one photo has been provided for the yellow-headed temple turtle, *Hieremys annandalei*.

The text is likewise neatly formatted, well organized, and aesthetically pleasing. The bulk of the volume consists of individual species accounts for all the terrestrial, semiaquatic, freshwater, and marine chelonians recorded from Borneo and the Malay Peninsula, including the almost universally introduced red-eared slider, *Trachemys scripta elegans*. Arranged on the basis of family affiliation, these accounts provide information on identification and concisely review the distribution, biology, and conservation status of each of these twenty-five species.

Of particular interest, at least to this reviewer, are the brief definitions of scientific names accompanying each species account. While obviously providing an extra-added tidbit of information, these reviews of the derivation of names undoubtedly also help foster a greater appreciation for scientific nomenclature, regardless of one's level of zoological expertise, and their inclusion in this or any other volume could not be more highly recommended.

A full citation to the publication of original description and a list of vernacular Malayan names complete each species account. The bibliographic listing of over 150 additional relevant titles likewise further enhances the volume's utility as a valuable reference tool. Rounding out the text are the almost obligatory introductory comments, a species checklist, an identification key, a short glossary, and a brief closing chapter on regional chelonian conservation.

While certainly very well done, a more detailed examination of the volume does reveal a small number of unfortunate textual flaws. By far the most glaring of these occurs in the book's Introduction, where the partial sentence ending page three remains unfinished by the equally incomplete sentence that opens page four. Making matters worse, the missing portions of both sentences, as well as any other sentences that may belong in between, have not just simply been misplaced but are instead absent from the text entirely.

Naturally, such faults are solely attributable to editorial error. Despite the obvious expertise of both authors, however, a few factual mistakes occur elsewhere in the text, as well, and these are perhaps most evident in the chapter on sea turtles. The olive ridley, *Lepidochelys olivacea*, for example, is not "the world's smallest sea turtle" as the authors' erroneously state on page 34. Indeed, it is widely known that this size distinction is properly applied to the closely related Kemp's ridley, *Lepidochelys kempii*, a species geographically quite far removed from Borneo and Malaysia.

At the same time, the authors' frequently repeated statement that sea turtles reach sexual maturity in "4 to 5 years" is clearly incompatible with data provided by a

number of other researchers. In fact, Chaloupka and Musick (1997) state that leatherbacks, *Dermochelys coriacea*, appear "to have by far the highest juvenile growth rates of all sea turtle species, reaching sexual maturity on average in around 13 to 14 years." Other published data likewise suggests natural maturation rates of at least 20 to 30 years and perhaps considerably more for most sea turtles in the wild (Balazs, 1982; Frazer and Ehrhart, 1985; Limpus, 1992; Limpus and Walter, 1980; Miller, 1997).

Other inconsistencies also turn up on occasion. *Orlitia borneensis*, for instance, is said to be the region's "largest freshwater turtle" at 800 mm in carapace length (page 85). This comment, however, is directly contradicted by the size data provided by Lim and Das for the Asian softshell, *Amyda cartilaginea* (830 mm), the narrow-headed softshell, *Chitra indica* (1150 mm), and the Asian giant softshell, *Pelochelys cantorii* (1500 mm), which all must surely be considered primarily freshwater species.

The Asian brown tortoise, *Manouria emys*, is likewise not included "in Appendix I of CITES" as the authors claim on page 109, but is instead listed in CITES Appendix II and then only by virtue of being a member of the family Testudinidae (i.e. the species is not specifically included by name in any of the three CITES Appendices). While on the subject, it is also perhaps appropriate to note that the various IUCN Red Data Book ranks, CITES Appendices, and IUCN/SSC Specialist Group Action Plan ratings, while freely cited throughout the text, are not defined or otherwise explained anywhere within the volume.

In spite of these criticisms, however, it is impossible to view *Turtles of Borneo and Peninsular Malaysia* as anything other than one outstanding little volume. Indeed, the quality and quantity of the color photographs alone quite easily justify the book's purchase price. At the same time, with the exception of a few relatively inconsequential mistakes and some inconsistencies, authors Lim and Das have provided a wealth of relevant information in an attractive, neatly compacted, and readily usable format. While obviously a worthy edition for any chelonian library, *Turtles of Borneo and Peninsular Malaysia* will undoubtedly prove invaluable to those with interests more narrowly focused on Asian turtles and tortoises.

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Limpus, C.J. and Walter, D.G. 1980. The Growth of Immature Green Turtles (*Chelonia mydas*) Under Natural Conditions. Herpetologica 36: 162 - 165.

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INFORMATION SOUGHT

Information sought on the post-implantation effects of microchip transponders in chelonians. Further to my published findings (Hine, M.L. 1999. Survey on the Effectiveness of Microchip Transponders in Chelonians. British Herpetological Society Bulletin, No 70 pp 17-19), I continue to seek information, for possible future publication, on the post-implantation success/failure rates of this method of identification as an alternative to non-invasive techniques. Information sought: Health/welfare e.g. stress, injury, infection, floatation, side-effects and mortality rates. Practical uses e.g. chip scanning, reading, compatibility difficulties, loss of chip, reprogramming and new developments in scanning products. Any information would be appreciated. Michael L. Hine, The Lodge, Normanby, York, North Yorkshire, YO62 6RH, England, UK. E-mail: mikehine@thelodge-ny.fsnet.co.uk

Seeking breeders of *Cuora* and *Cistoclemmys*. The American Zoo and Aquarium Association (AZA) recently appointed me North American Regional Studbook Keeper for Asian box turtles (*Cuora* and *Cistoclemmys*). I am beginning to compile information for the studbooks and need your help.

As you are no doubt aware, turtle populations of Asia are in perilous decline, and the situation has reached crisis proportions. The primary reasons for decline include unsustainable and unregulated harvesting and exploitation for food markets and traditional Chinese medicine. It is expected that a number of these species may soon become extinct in the wild, and will likely depend on captive populations for their survival. The situation is, to say the least, time-critical. We must begin developing well- managed captive breeding populations now in order to head off this disaster.

Asian box turtles were recently placed on Appendix II of CITES and have become largely unavailable. This simply means that we must responsibly manage the wild stock already in captivity and reduce our acquisition of wild collected specimens. Accurate studbook data is necessary for this effort to be successful and is fundamental to a long-term breeding program for any endangered species. In years to come, this studbook will provide a recorded history of our efforts with these particular species, while providing much needed information such as age and sex specific rates of fecundity, maturity, longevity, and mortality. Due to the low numbers of wild-caught potential founders for some of these *Cuora*, it is important that they be more intensively managed than some of the more common species. Finally, given the fact that the private individuals hold most of the rare *Cuora* in captivity, it is imperative that we encourage cooperation from this sector. We hope you will join us in this collaborative endeavor.

This is how being a studbook participant works: If requested, private individuals participating in this studbook can be assigned a code identifing you and your turtles and protecting your anonymity! There are guidelines for identification and monitoring that I will be following as Studbook Keeper. The information you provide will become part of a confidential database so you and your animals are protected. Participating in a studbook in no way obligates you to do anything with your animals that you don't want to. It is simply a management tool that, in years to come, will be able to select the most valuable pairings to improve the genetic health of the overall captive population. Those pairings are recommendations only. Studbook participation implies accurate record keeping and permanent specimen identification, i.e. shell notch, PIT tag, scans, and photos.

The species in my realm of responsibility are *Cuora aurocapitata* (Yellow-headed Box Turtle), *C. flavomarginata* (Yellow-margined Box Turtle), *C. galbinifrons* (Indochinese Box Turtle), *C. mccordi* (McCord's Box Turtle), *C. pani* (Pan's Box turtle), *C. trifasciata* (Three-striped Box turtle), *C. zhoui* (Zhou's Box Turtle), and *C. serrata* (Serrated Box Turtle).

If you are in touch with other keepers of Asian species that are of special concern, please feel free to have them contact me and I will forward the names to the appropriate studbook program.

Thank you very much for taking the time to help me with this very important project. This is the only hope that many threatened Asian species will have in the future.

Sincerely, Annabel Ross, Fort Worth Zoo, 1989 Colonial Parkway, Fort Worth, TX 76110. Email: records@fortworthzoo.org

ANNOUNCEMENTS

Hofstra University Diamondback Volunteer Project. Dr. Russell Burke, Dept. Biology, Hofstra Univ., (516) 463-5521 E-mail: biorlb@hofstra.edu. Volunteers are needed to help with a local diamondback terrapin conservation project this spring and summer. Students can receive credit for their participation in this program. You can get a fantastic tan while helping out a species in trouble, get valuable experience with wildlife, and do something for the natural world! Volunteers must have their own transportation to Jamaica Bay Wildlife Refuge in Gateway National Recreational Area (Brooklyn and Queens). For more information contact the author.

8th Annual Conference of the Association of Reptilian and Amphibian Veterinarians (ARAV), to be held in conjunction with the American Association of Zoo Veterinarians, on September 19-23, 2001 in Orlando, Florida. Herpetologists, veterinarians, herpetoculturists, veterinary technicians, and students are encouraged to attend. Papers will address medically important aspects of herpetological physiology, anatomy, ecology, husbandry, herpeto-pathology, surgery, anesthesia, parasitology, pharmacol-ogy, clinical techniques, and illustrative clinical case reports. For more information, visit http:// www.arav.org

International Turtle and Tortoise Symposium will be held January 17-20, 2002 in Vienna, Austria. The primary organizers for this event are Schildkrötenfreunde Österreich (SFÖ), Nederlandse Schildpadden Vereniging (NSV) and the Chelonia 2002 Turtle Center. The symposium is dedicated to increasing our knowledge and understanding of breeding in captive freshwater turtles and tortoises. The international exchange of views and experiences between experts and dedicated hobbyists from different countries and continents will be strongly encouraged. We anticipate that this symposium will be among one of the most significant turtle breeding symposia events ever and therefore should not be missed by anyone with a serious interest in breeding and conservation of turtles.

Conference languages will be English and German with simultaneous translation. Two of the presentations will be given in French with special translations.

A number of activities for accompanying persons will be offered each day. These and the evening programs will have to be paid extra.

Every participant MUST register in advance by letter, fax or E-mail. Participation cannot be guaranteed unless your registration is received by Aug. 31, 2001! Send registration applications to Dr. Harald Artner, Maria Ponsee 32, A-3454 Sitzenberg-Reidling, Austria; Fax: +43-2276-6140, E-mail: 113142.3232@compuserve.com

As soon as your registration is received, you will be informed about payment methods including Eurocard/ MasterCard and VISA. After we have received your payment, you will receive the final program and additional information on hotels, supporting programs, etc...

Attendance fees, due this fall, are given in EUROS (E) which equal approximately $0.88US. Deadlines and prices are.

	Aug. 8	Nov. 30	after Nov. 30
4-day ticket	70	80	100 E
4-day ticket members *	35	40	50 E
day ticket	25	30	40 E
day ticket members *	12	15	20 E

* members of SFO, NSV, Chelonia 2002

Gopher Tortoise Conservation Initiative™, Field Training Program On Gopher Tortoise Management And Mitigation Techniques For: environmental consultants; land managers involved with tortoise management; county and state personnel who are responsible for establishing policy, permit oversight, and mitigation; and researchers involved with gopher tortoises throughout its range.

The goal of these workshops is to provide some guidance and first hand experience in working with gopher tortoises and the uplands habitat, as well, as using techniques such as burrow identification and excavation properly.

The workshops will be held at the Finca de la Tortuga Biological Preserve in Archer, Florida (Directions provided with registration confirmation) on four dates this summer and fall (June 27-29, August 3-5, September 11-13, October 23-25) and two dates to be announced next spring.

The Program: Each session is limited to 12 participants. The program is designed to provide a demonstration and then give participants a chance to work hands-on in the field with the following: Making population estimates, Burrow counts and mapping, Habitat analysis, Forage utilization to determine carrying capacity, Trapping techniques, Burrow Excavation, Use of Burrow Scope and other specialized equipment, Taking blood and other samples, Developing on/off-site uplands & artificial tortoise preserves, Develop-ing Mitigation and Management Plans, and Code of Ethics

Daily Schedule: There will be morning and afternoon field sessions each day. The participants will be split into three small groups and will attend each session on a rotating basis. This will allow for everyone to have maximum hands-on time. A two-hour classroom session will be held at midday for all three days. For details and registration package, contact us via E-mail, phone or fax; numbers are below. Ashton Biodiversity Research & Preservation Institute, Inc. 14260 W. Newberry Rd. #331 Newberry, FL 32669; Phone 352-495-7449; Fax 352- 95- 7433; Tortfarm2@aol.com; http://www.geocities.com/ashtonbiodiversity.

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Text: To ensure a swift turnaround of articles, we ask that, where possible, all submissions be in electronic format either as an attached E-mail file or on disc. If compatible computer facilities are not available, hard copies of the article can be sent to the editors by mail or fax. Scientific names should be italicized and given in full in their first appearance. Citations in the text should take the form of (Kuchling, 1989), (Martin and Bateson, 1986), (Ernst *et al*., 1994). All articles need to be accompanied by the name of the author and a complete hard copy mailing address. If you wish your E-mail address, phone or fax number included please include them in your address.

Table/Figures/Illustrations: Each figure should be stored as a separate document in Word, Wordperfect, Excel, .bmp, .tif or .jpeg file. The editors will scan figures, slides or photos for authors who do not have access to such facilities. Tables and Figures should be given in Arabic numerals. Photographs will be considered for inclusion.

References: Citation format for different styles of references should be as follows:
a. For an article in a journal: Gaffney, E.S. 1979. Comparative cranial morphology of recent and fossil turtles. Bull. Amer. Mus. Nat. Hist. 164:65-376.
b. For a book: Cogger, H.G. 1975. Reptiles and Amphibians of Australia. Sydney: A.H. and A.W. Reed, 660 pp.
c. For an article in an edited volume: Pritchard, P.C.H. 1979. Taxonomy, evolution, and zoogeography. In: Harless, M., and Morlock, H. (Eds.). Turtles: Perspectives and Research. New York: John Wiley and Sons, pp. 1-42.
d. Citations with two or more authors have all authors listed last name first and separated by commas: Dodd, C.K., Jr., Franz, R., and Smith, L.L. 1994. Title. Reference.

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