

www.YearoftheTurtle.org

Year of the Turtle News

No. 8

August 2011

Basking in the Wonder of Turtles

Taking Action for Turtles: The States' Role

All across the world, Year of the Turtle efforts are in full swing. From children and families, to community nature centers, schools, researchers, and artists, awareness of turtle conservation is on the rise. In the United States, one exceptionally big reason for this increased awareness is due to the breadth of research, conservation, and education efforts

being carried out at the state level. State fish and wildlife conservation agencies are charged with managing all fish and wildlife, including turtles, in the public trust. As such, they play a key role in managing turtle populations in the wild, including management and regulation of various human uses of turtles, such as pets, food, or scientific study, and in

protecting rare and threatened turtles in the United States. In 2005, all state fish and wildlife agencies had to complete State Wildlife Action Plans (see www.wildlifeactionplans.org to learn more about your state's goals) to help assess the status of their wildlife and to develop specific actions to help keep common species common. In these, they identified "species of greatest conservation need" and in several states, turtle species were part of this list. As a result of these plans and State Wildlife Grant funding, along with the assistance of many partners, turtles are receiving more conservation attention than ever before in many of these agencies. Given that turtles in the United States are not being spared from the declines being seen elsewhere across



Endangered Alabama Red-bellied Turtles fell victim to highway traffic on the Mobile Bay Causeway until protective fencing was installed. Mortality has been greatly reduced.

More State Fish & Wildlife Projects on p. 9

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Name That State's Turtle

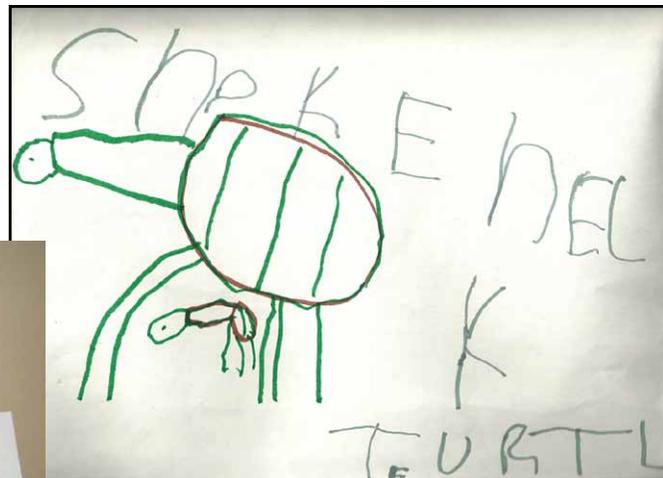
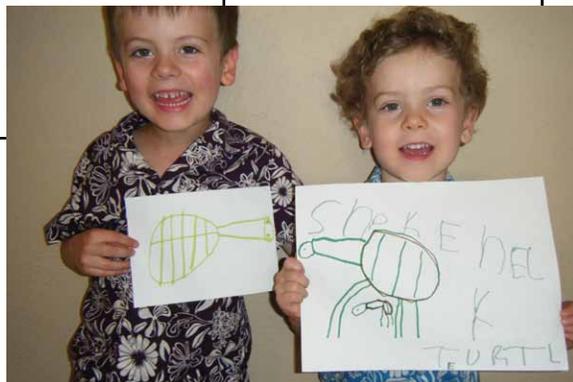
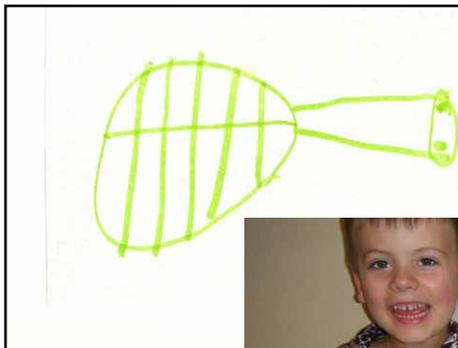
Can you identify which turtle species below are the official "state turtle" and/or "state reptile" of the select states on the right? Note: some species will match with more than one state. For the correct answers, see page 12.

- | | | |
|--------------------------|------------|----------------|
| Desert Tortoise | Alabama | Missouri |
| Gopher Tortoise | California | Nevada |
| Loggerhead Sea Turtle | Colorado | New York |
| Eastern Box Turtle | Florida | North Carolina |
| Ornate Box Turtle | Georgia | South Carolina |
| _____ Red-bellied Turtle | Illinois | Tennessee |
| Snapping Turtle | Kansas | Vermont |
| Diamondback Terrapin | Maryland | |
| Painted Turtle | Michigan | |
| Three-toed Box Turtle | | |

Answers on p. 17 -- No cheating!

"Behold the turtle. He makes progress when his neck is out." — James Bryant Conant (1893-1978), educator and scientist

Turtle Art, Stories, and Poetry



Jonas Selbo (left, now age 6) and his brother Ronan (right, age 4) of Arvada, Colorado, show off their artwork. Photos by Sarena Selbo.

Jonas and Ronan, sons of Sarena Selbo of the U.S. Fish and Wildlife Service and her husband Gabe, drew these pieces of turtle artwork in celebration of World Turtle Day in May. Thanks, Jonas and Ronan for your wonderful work!

Do you have a turtle story or piece of art that could be highlighted during the Year of the Turtle? Submit your turtle art (in jpg, tiff, or pdf format) and copies of your stories and poems via email to yearoftheturtle2011@gmail.com. We will be including submissions in upcoming newsletters and in other Year of the Turtle materials and outreach efforts throughout 2011, and we want your work to be part of it!

NEPARC is now offering Year of the Turtle t-shirts!

Orders are being accepted until August 3 and will ship in August. If there is a high enough interest, a second opportunity to order may open after this order period closes. Men's and women's styles available (women's style has the same design as the men's but is available in a women's cut). Visit www.northeastparc.info/Home_Page.html for design, price, and additional information.



Get Your August Calendar!



Nathan Shepard photographed this charming Bog Turtle (*Glyptemys muhlenbergii*) in 2008 while assisting with Project Bog Turtle, an initiative of the North Carolina Herpetological Society. Get a better look at this month's winner and runner-up by downloading your calendar at parcplace.org/images/stories/YOT/YearoftheTurtleCalendarAugust.pdf

And it's STILL not too late to enter the 2011 Calendar Photo Contest! We are accepting entries all year long. Give us your best shot! For more information and for entry details, please visit www.parcplace.org/news-a-events/224.html.

Turtle Conservation Efforts Continue in Michigan One Year After Oil Spill

By Chris Tabaka, DVM, Lisa Duke, Chris Gertiser, and Angel Mitchell, LVT, Binder Park Zoo, Battle Creek, Michigan

On July 26, 2010, nearly 1,000,000 gallons of oil spilled from a leaking pipeline into Talmadge Creek along the city of Marshall in southwest Michigan. This spill quickly spread along a 25-mile segment of the Kalamazoo River. Locally, the oil spill was incredibly devastating, affecting countless animals, particularly the diverse and extensive herpetofauna population of the Kalamazoo River. During 2010, over 2,500 turtles of eight different species (Michigan has nine species of native chelonia) were collected from the oil-soaked river. Binder Park Zoo staff was instrumental in providing expert veterinary, husbandry, and cleaning assistance for the oil-covered turtles that were recovered from the Kalamazoo River, as well as coordinating with area zoological institutions, nonprofit organizations, and universities to staff the rescue effort. Approximately 2,000 of these transponder-implanted animals have been released back into the cleaned river system, and our vet staff continues to provide daily veterinary care to over 470 turtles that were overwintered before they are released into the watershed this spring and summer. Over 60 turtles have been hatched from ova from the overwintered animals and will be similarly released



Blanding's Turtle (*Emydoidea blandingii*), photo by Jeff Hall.

once they gain a little size. Further collection efforts are under way for animals in the river system that are still affected. Thanks to a grant from Target/HandsOn Battle Creek, radiotracking equipment and transmitters have been purchased to track the Blanding's Turtles affected by this spill. Over the next three years, the animals will be monitored and eggs opportunistically collected in the spring, artificially incubated, and the hatchlings headstarted to assist with recruitment in this dwindling population.

Turtles in the News

Wildlife officials in Massachusetts have launched the Turtle Roadway Mortality Study to ask for the public's assistance in identifying turtle roadkill hotspots. The project is a joint multi-year effort by the state Department of Transportation, the state Natural Heritage and Endangered Species Program and the Vernal Pool Association. Find out how to participate and more from **MassLive.com** at www.masslive.com/news/index.ssf/2011/07/massachusetts_wildlife_official.html.

After more than three months of veterinary care, the most famous turtle in Vietnam has been returned to Hoan Kiem Lake. Read the latest developments, questions, and concerns in this ongoing effort to save a sacred symbol of Vietnamese

independence from **Thanh Nien News** at www.thanhniennews.com/2010/Pages/20110715223912.aspx.

A recent report estimates that shrimp boats that fish in the Gulf of Mexico without the required turtle-excluder devices are killing more sea turtles than is allowed under the Endangered Species Act. However, shrimpers dispute this finding, stating they are doing all that is reasonable to help ensure sea turtles are not being harmed by their traps. Read more from the **Miami Herald** at

www.miamiherald.com/2011/07/13/2313335/shrimpers-dispute-findings-on.html.

And finally...the Sacramento Turtle and Tortoise Club hosted Turtlerama

on July 16. Watch a video highlighting "Sweet Pea," one of the visitors to the event, from the **Sacramento Bee** at videos.sacbee.com/vmix_hosted_apps/p/media?id=101259291,

If you have items you would like to contribute to Turtles in the News, please send them for consideration to yearoftheturtle2011@gmail.com.

Follow all of the Year of the Turtle news and happenings on **Facebook** (<http://www.facebook.com/pages/yearoftheturtle2011>)

and **Twitter** (<http://twitter.com/YearOfTheTurtle>).

facebook



August's Featured Citizen Science Programs

Get involved in a citizen science (volunteer) program in your neighborhood, community, or elsewhere!

Citizen science places volunteers of all backgrounds and ages in partnerships with organizations and scientists to collect important biological data. This month we highlight two sea turtle citizen science programs based in Hawaii with which you can become involved. A full list of US and international programs can be found at www.yearoftheturtle.org. We thank everyone who has contributed information on their citizen science programs to the Year of the Turtle thus far. **Are you involved with a turtle citizen program or have information on a specific project that you would like to share?** Please send information on your citizen science programs to yearoftheturtle2011@gmail.com and make sure your project helps us get more citizens involved in turtle science!

Hawksbill Sea Turtle Recovery Program

This volunteer program seeks to assist biologists in the Hawaii Volcanoes National Park in protecting and collecting baseline data about nesting Hawksbill Turtles (*Eretmochelys imbricata*). Volunteers are asked to monitor sea turtle nests, assist with research activities on adult sea turtles, record field data, as well as provide outreach to the local community. The volunteers also remove non-



Photo: US National Park Service

native predators, such as mongooses, rats, and feral cats. The program asks volunteers to make at least a 10-week commitment to camp out 4 to 6 nights per week on remote beaches around the island from May to December. Volunteer contributions are critical because Hawksbill Turtles are quite rare in Hawaii.

Contact Information

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Resources Management Division
P.O. Box 52, Hawaii Volcanoes National Park, HI 96718
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Malama Na Honu Foundation

This foundation is a non-profit organization run by more than 60 volunteers ("Honu Guardians") working to protect Hawaiian Green Sea Turtles (Honu, *Chelonia mydas*). The goal of this organization is to protect the sea turtles through education, public awareness and conservation efforts. The Honu Guardian volunteers patrol the Laniakea Beach, located a few miles north of Haleiwa on Oahu's North Shore, every day of the year and provide educational outreach to beach visitors. The Malama Na Honu Foundation is the successor to the "Show Turtles Aloha" campaign, started by the National Oceanic and Atmospheric Administration's Marine Turtle Research Program in 2005.



For more information or to volunteer, email info@malamanahonu.org.

To learn more about the Malama Na Honu Foundation, please visit <http://malamanahonu.org>.

Are You an Educator or Interpretive Naturalist?

We continue to work to develop a collection of Year of the Turtle resources for teachers and naturalists to use for turtle education. If you are willing to share, please send your unit materials, educational program information, websites, or PowerPoint presentations to yearoftheturtle2011@gmail.com. Please include your name, the name of your school/nature center or organization, and location. If you did not create the materials, please be sure to tell us where you found the materials.

An Interview with Ann McLuckie

By Jason L. Jones, Utah Division of Wildlife Resources



How did you become interested in studying turtles and at what age did your interest in these shelled reptiles start?

I was always interested in wildlife. When I was young I was actively involved in the Ranger Rick Club. I was always fascinated when we would find turtles and other reptiles on family camping trips. In high school I remember being really interested in the concepts of evolution and how species evolved. It probably didn't hurt that my siblings were not interested in any of this, so it was my own niche. After I finished college, I saw an ad for a volunteer job studying tortoises in southwestern Utah with the Utah Division of Wildlife Resources. This became my first herpetology field job where I now do tortoise research.

In your opinion what is the biggest conservation issue facing Desert Tortoises given the myriad threats out there today? Is this different from the issues facing turtles across the globe?

The biggest conservation issue facing tortoises is the encroachment of humans, which includes roads,

development, and recreation. For example there is a push to put a road in the middle of a Desert Tortoise reserve. I don't think the issues facing turtles across the globe differ much from those facing Desert Tortoises. Turtle and tortoise populations in some isolated areas might be hunted for meat or collected for trade, while human encroachment or related activities might be the main issue facing another population. I think it's only different in the sense that it's a road, recreation area, or a trail here, whereas it is harvest, collection, and other forms of habitat destruction in other parts of the world.

Given 2011 has been designated the Year of the Turtle, what can biologists and tortoise enthusiasts do to make people more aware of importance of tortoises and the role they play in our ecosystems?

I think conveying to people that tortoises are really important to monitor because they are umbrella species is important. Tortoises tell us how well other desert species are doing and the overall health of our reserves and how things are connected. It's important to convey the uniqueness of these species and the importance of sharing space with these species. It's important to educate young people about these species. Most kids love animals and enjoy being outdoors. I think they lose this connection with the outdoors with age, so to instill and maintain that love through adulthood is important for tortoise conservation. Our job as biologists is to convey how connected we really are to these species and that when their populations aren't doing

well, something isn't right. We all have responsibility as stewards of the Earth. If tortoises aren't doing well, we need to ask ourselves what that means in terms of the health of the ecosystem.

What are ways the public can help in the conservation of Desert Tortoises?

I think the public can help by recycling, consuming less, minimizing trips in the car, supporting local state and national parks, and writing to public officials about how you feel regarding open spaces and species conservation. Those individuals who appreciate the outdoors should participate in the public process and make their opinions known. The public needs to be more mindful as to how much we consume, and pass that mindfulness on to younger generations.



What guidance on turtle conservation do you have for policy and decision makers?

For policy makers, I would say that we have to preserve more open spaces. Open space improves the quality of life and property values. We should encourage policy and decision makers to develop better forms of public transportation and recycling programs to minimize overall consumption in our communities.

**The views and opinions of interviewees are not necessarily shared by all members of PARC or other Year of the Turtle Partners.*

What is your favorite turtle or group of turtles?

My favorite group of turtles would have to be the large bodied island tortoises, like the Galapagos and Aldabra Tortoises. These tortoises are the number one thing on my bucket list that I have to see before I die! I've worked on tortoises for so long that I find it fascinating to see what other tortoises are like in other parts of the world. And these tortoises are so BIG! Plus, Darwin was hanging out on the Galapagos Islands, is that cool or what? It's also amazing that you can go to a different island and see a different tortoise subspecies.

Do you have a favorite field story or defining moment as a tortoise biologist?

My first tortoise job was working with a graduate student on a

forage ecology study of tortoises in southwestern Utah. The first week of the job, my boss brought me out to a telemetered tortoise and wanted me to follow this tortoise once he left his burrow, recording the number of bites taken and of what plant species. It was my first time ever being in the Mojave Desert and the first time ever watching a Desert Tortoise. So I waited and waited and kept looking in the burrow, where I could see the tortoise hadn't moved. I decided to take a nap, and every so often I would wake up and check on the tortoise. Well, I must have dozed off for longer than I thought because when I woke up to check on the tortoise it had left its borrow and was nowhere in sight! I thought this job was going to be a piece of cake! It was a very humbling

experience. I realized that these tortoises know their environment well and are smarter than I am in their environment.

What advice would you give young people (or adults) who love turtles and want to work with them?

I would suggest that they join the TSA (Turtle Survival Alliance) and stay active in that community. Join turtle and tortoise clubs and stay politically active. Make your voice heard. Open spaces, turtle habitat, and turtle protection are important. Keep that love for turtles and tortoises and make it an active component of your life.

“Turtles of New Mexico” Poster Now Available

as part of NM Department of Game and Fish ongoing turtle research and conservation efforts. By Leland J.S. Pierce, NMDGF

New Mexico is home to ten species of turtle, and the New Mexico Department of Game and Fish (NMDGF) has been active in their conservation. In 2010 the NMDGF published an article in its statewide newspaper insert to educate the public on the negative impacts of releasing unwanted pet Red-eared Sliders (*Trachemys scripta*) on a native species of turtle with a very restricted range, the Big Bend Slider (*T. gaigeae*). This year, the NMDGF continues its education program on behalf of turtles, publishing a “Turtles of New Mexico” poster. The back of the poster includes information on the PARC



Western River Cooter, Eddy County, NM. Photo by Charlie Painter.

Year of the Turtle program, as well as advice for conserving native turtles. New Mexico state herpetologist Charlie Painter is conducting surveys to update the status of the two turtles of greatest conservation concern, Big Bend Slider and Western River Cooter (*Pseudemys gorzugi*). The primary issue for the Western River Cooter is people shooting a turtle with a very limited range and population size in New Mexico. Finally, the NMDGF terrestrial species recovery coordinator Leland Pierce will be creating more outreach materials on behalf of both species. Anyone interested in obtaining a “Turtles of New Mexico” poster or other outreach materials may call NMDGF Public Information and Outreach at (505) 476-8000.



Big Bend Slider, Socorro County, NM. Photo by Jim Stuart.

Is Your Organization Interested in Becoming a Year of the Turtle Collaborating Partner?

If you are interested in contributing to the Year of the Turtle efforts, please send an email to yearoftheturtle2011@gmail.com with a brief description of your organization and its efforts. Our full list of collaborating partners can be found at <http://parcplace.org/news-a-events/year-of-the-turtle/237.html>

Turtle Spotlight: Red-bellied Cooter

By Thomas W. French, Massachusetts Division of Fisheries and Wildlife

The Massachusetts population of the Northern Red-bellied Cooter (*Pseudemys rubriventris*) was federally listed as Endangered with Critical Habitat in 1980. At that time, fewer than 200 turtles were known from 10 ponds in a 1500-acre area of Plymouth County. The very next year, a population was discovered in another pond just outside of the designated Critical Habitat. This pond was a natural boggy wetland enhanced by a dam to create a reservoir for a private cranberry bog complex. The discovery of this site nearly doubled the known population size, but was not enough to change its Endangered status. This isolated population was recognized as a distinct subspecies, *Pseudemys rubriventris bangsi* but is now considered a disjunctive population of a species that occurs from the coastal regions of New Jersey through North Carolina. At the time of listing, this population was restricted to ponds, which in many cases were relatively small kettle holes with no inlets or outlets. These ponds provided relatively small areas of habitat with limited avenues of dispersal between ponds. Nearly all of the nests were being destroyed by predators, so the population was mostly made up of old adults with very little recruitment of young animals.

Since 1985, headstarting of hatchlings has been one of the management tools used to increase the overall number of turtles, boost depleted populations in individual ponds, restore populations to ponds in which the species had disappeared, and to introduce the species to nearby water bodies with appropriate habitat. Over these 25 years, a total of 3,569 hatchlings were kept for headstarting. After being raised for 9 months over the winter by cooperating organizations, 3,339 (94%) hatchlings survived to be released at a significantly larger size in the spring. This process includes covering nests with a wire mesh cage to protect them from predators, monitoring each protected nest for emergence, releasing about 75-80% of all resulting hatchlings directly into the pond, and distributing the remainder of the hatchlings to cooperating organizations and individuals to keep over the winter. The first headstarted female confirmed nesting was a 13 year old found in 2000. Although the largest new population, which was established solely from the release of headstarted turtles, is in a wetlands complex covering parts of four towns and far too large to closely monitor, annual observations of adult headstarted females laying eggs are reported, and numerous large adult headstarted turtles are routinely observed basking together on logs.



Headstarted hatchling Northern Red-bellied Cooter being measured before release.



Headstarted Red-bellied Cooter hatchlings.

It's not too late!

Registration is still open to attend the 9th Annual Symposium on the Conservation and Biology of Tortoises and Freshwater Turtles August 14-17 in Orlando, Florida. The meeting is co-hosted by the Turtle Survival Alliance and the IUCN Tortoise and Freshwater Turtle Specialist Group (TFTSG). Be sure to visit the conference page at www.turtlesurvival.org/get-involved/2011-conference to register for the meeting, to book your room at the conference hotel—the Rosen Plaza—and to view the full meeting schedule.



Meet the PARC Year of the Turtle Team – Priya Nanjappa



Priya Nanjappa and friend. Photo by Brian Aucone.

With the month of August dedicated to highlighting the work of the State Fish and Wildlife Agencies, it is fitting to introduce Ms. Priya Nanjappa in our “Meet the PARC Year of the Turtle Team.” Priya is the Amphibian & Reptile Coordinator for the Association of Fish and Wildlife Agencies and serves as the National State Agencies’ Coordinator for PARC. She’s worked with herpetofauna and conservation since her summer stint at Iowa Lakeside Laboratory in northwestern Iowa where she caught and identified skinks and garter snakes, and saw her first Blanding’s Turtle, which was unfortunately found dead on a road (incidentally, a few years later, the first Wood Turtle she saw was also dead on a road). She went on to work with a professor from that field lab, Dr. Michael Lannoo for her Master’s degree in 2000, which focused on amphibian conservation. After that she spent 5 years co-leading the field crew for the US Geological Survey’s Northeast Amphibian Research and Monitoring Initiative in Maryland, where, while searching for amphibians and documenting vernal pools on the Patuxent Wildlife Research Center, she would encounter many of the very same Eastern Box Turtles that were marked starting in 1945 by Louise Stickel, a well-known biologist who worked in the area documenting box

turtle populations. It was amazing for her to think that some of the turtles they observed were held and marked by Stickel herself. Priya and the team continued to use Stickel’s method of marking turtles, and found a good number of new turtles to mark thereby helping to further Stickel’s long-term population study.

Following this work, Priya was hired into the position with PARC in 2005, first as a contractor for the states, and in 2008 as a full employee of the Association of Fish and Wildlife Agencies, where she continues to work today on amphibian and reptile conservation policy and project coordination.

Some of Priya’s favorite turtle memories include:

- Her first encounter with an Eastern Box Turtle was near the creek about a mile from her childhood home in eastern Iowa; she was about 8 or 10 years old, and saw its beautiful, bright orange-mottled head and shell peeking out of some long grasses.

- During her work at Patuxent, she was wading into a vernal pool to take pond depth measurements, and in the murky water, a bunch of bright yellow spots traversed her wading boots. She snapped down to grab it – her first Spotted Turtle – this is one of Priya’s favorite turtle species.

- Also while working at Patuxent and driving to an external field site,



she experienced her first “turtle-jam” where a large female Snapping Turtle was trying to cross the road and backed up cars in both directions. One driver went out to try to move it, grabbing turtle incorrectly and nearly getting bitten. Priya and the field crew jumped out of their vehicle and were able to help it across.



- Most recently, Priya went “noodling” in 2009 for wood turtles with colleagues near the Virginia/West Virginia border. It was a particularly cold October day, which made it memorable, and she accidentally topped her hip waders with the icy creek water, which was a bit of a shock. She did, however, go back in and got the turtle she was after (which they measured, photographed, and released back to the creek).

- Her most favorite memory, however, is of a young boy looking at the Eastern Box Turtle that Priya had just found at Rock Creek Park in Washington, DC during a program that USGS was holding with school kids there. He said, “It looks like it’s wearing a turtleneck – ohhhh!” and she loved seeing his expression change immediately from observation to realization of why turtleneck shirts are so named!

Field photos by Al Savitsky.

State Agency Projects, continued from p. 1

the globe, these efforts at the state level are even more important today.

What follows is a selection of some of the wide-ranging research, conservation, and management work that is being done across the United States in state fish and wildlife agencies to help benefit these magnificent and ancient shelled-creatures.

Alabama Department of Conservation and Natural Resources

The Alabama Red-bellied Turtle (*Pseudemys alabamensis*) was named the official state reptile of Alabama in 1990. Currently, the Alabama Wildlife and Freshwater Fisheries Division has four turtle projects underway:

1. *Reassessment of the Status of the Federally Endangered Alabama Red-bellied Turtle*, led by Dr. Jim Godwin at Auburn University/Environmental Institute. Within the recovery plan for the Alabama Red-bellied Turtle the tasks with highest priority are to determine population parameters and study the ecology of the species and to prepare guidelines for conservation. The primary objective of the project is to determine whether the population of the Alabama Red-bellied Turtle has improved, declined, or remained stable since the 1990s.



Hatchling Alabama Red-bellied Turtle.
Photo from Outdoor Alabama, ADCNR.

2. Alabama Red-bellied Turtle Mortality Study, led by Dr. David H. Nelson at University of South Alabama. Each year many of these freshwater turtles are killed by vehicles on the Mobile Bay causeway (US Hwys. 90 & 98) and elsewhere. From 2001-2009, 603 turtles were killed on the causeway, and road mortality appears to be a major threat to the recovery of this beleaguered species. In 2008, in order to reduce road-kill mortality, the Alabama Department of Transportation constructed a low, roadside fence along the eastern causeway where road-kills were greatest. This project is designed to continue monitoring the proposed fencing and assess continued turtle mortality. The status, activity, and location of all turtle mortalities are documented in order to evaluate the

continuing success of the project and make conservation recommendations for the future. The annual loss of 6 - 20 reproductive females, each of whom required 12-15 years to reach reproductive maturity, is significant. Continued losses of breeding females are a very serious conservation issue that may result in long-term population decline. Over the last three years, since the fencing was installed, mortalities have declined by 75% (2008), 82% (2009), and 81% (2010).

Flattened Musk Turtle.
Photo from U.S. Geological Survey.



3. Conservation Genetics and Site Occupancy of Flattened Musk Turtle (*Sternotherus depressus*), led by Dr. Leslie Rissler at the University of Alabama. The Flattened Musk Turtle is a federally threatened turtle that is endemic to northern Alabama within the Black Warrior drainage system north of Tuscaloosa. *S. depressus* was listed as federally threatened due to habitat alteration from practices including agriculture, mining, forestry, industrial and residential development, stream impoundments, and unlawful collecting. No range-wide evaluation of the status of *S. depressus* has been conducted in over 25 years, and no population-level genetic studies have been conducted. Objectives of the study are to: 1) evaluate the status of *S. depressus* across its range; 2) evaluate the effects of food availability and habitat quality on *S. depressus* site occupancy; and 3) to collect tissue from *S. depressus* across its range for a genetic study of population structure and gene flow.

4. Use of Gopher Tortoises (*Gopherus polyphemus*) in Restoration of the Upland Longleaf Fauna on the Conecuh National Forest, led by Dr. Craig Guyer at Auburn University. The longleaf pine ecosystem is one of the world's most imperiled forest types. Many rare amphibian and reptile species are found in this forest, especially those that burrow in loose soils. The Gopher Tortoise is a keystone species of the longleaf pine ecosystem, principally because of the burrows that this species creates, which support an unusually rich flora and fauna. For these reasons, Gopher Tortoises are crucial to the success of conservation plans for the longleaf pine ecosystem. Thanks to 15 years of proactive management

on the Conecuh National Forest (CNF), the habitat structure of a significant portion of the forest has moved closer to the conditions found in old-growth longleaf pine forests. However, Gopher Tortoise populations on the CNF have not recovered to densities observed in old-growth forests. The slow recovery of tortoises makes it difficult to create features that will allow recovery of other missing species such as the Eastern Indigo Snake, Southern Hognose Snake, and Eastern Pocket Gophers. Therefore, implementation of active tortoise management to enhance populations on the CNF is vital for maintenance of the longleaf ecosystem on this key property. This project is: 1) working with staff at the CNF to develop a plan for implementing herpetofauna repatriation projects; 2) surveying and mapping burrows of Gopher Tortoises on a large site selected for release of Eastern Indigo Snakes; and 3) has established five large penned sites for relocation of adult Gopher Tortoises and juvenile Eastern Indigo Snakes.



Gopher Tortoise heading back to its burrow. ADCNR.

5. Beginning in October 2011, another study will begin with Dr. Jim Godwin, Auburn University, as the project leader. This study, Taxonomic Assessment of Map Turtles (*Graptemys*) of the Choctawhatchee and Pea Rivers, will determine if turtles currently identified as *Graptemys barbouri* and *G. ernsti* in the Choctawhatchee and Pea Rivers warrant taxonomic recognition separate from *G. barbouri* in the Apalachicola-Chattahoochee-Flint River system, and/or *G. ernsti* from the Conecuh-Escambia-Yellow River system.

Connecticut Department of Environmental Protection

The Connecticut Wildlife Division has been participating in PARC's Year of the Turtle celebration by informing Connecticut (CT) residents about the state's native turtles through monthly press releases, a Year of the Turtle Web page (www.ct.gov/dep/yearofturtle), a CT Turtles portable display, articles and turtle species

profiles in issues of our bimonthly magazine, Connecticut Wildlife, a children's art contest, and other related events. The monthly press releases have been very well received by the media and turtles have garnered more press coverage than usual.

The Turtle Art Contest for Kids was the Wildlife Division's first attempt at holding an art contest. The contest was open to children from kindergarten through 5th grade, who were asked to submit original artwork of a turtle species native to Connecticut. We received over 220 entries, mostly from Connecticut residents but also from Florida, California, New York, Illinois, North Carolina, and even Malaysia. The entries were judged in three categories: K-1st grade, 2nd-3rd grade, and 4th-5th grade. Prizes were donated by the Connecticut Science Center and the Friends of Sessions Woods.

The Wildlife Division held a Turtle Day on June 26 at our Sessions Woods Conservation Education Center in Burlington. Turtle Day was a huge success! This FREE event was attended by approximately 270 people who listened to informative talks about turtles (CT Turtles, the Eastern Box Turtle, Sea Turtles and the Marine Animal Stranding Program) and had the opportunity to see live turtles and tortoises. Children could participate in various turtle crafts, get a turtle face painting, listen to turtle stories, and learn about turtles. All of the artwork submitted for the Turtle Art Contest was displayed, including the winning entries. Awards and prizes for the art contest were presented to the winners during Turtle Day. This event was sponsored by the Friends of Sessions Woods.

The Wildlife Division developed a portable display on Connecticut's Turtles. It has been traveling to various conservation events, including a Turtle Day at the Mystic Aquarium in Mystic, Connecticut. When not traveling, the display is set up in the Exhibit Room at the Sessions Woods Conservation Education Center.



Julia Stamp's Wood Turtle won 1st Place in the kindergarten/1st grade category of the CTWD Turtle Art Contest.



Diamondback Terrapin, by Andrew Grosse

Delaware Division of Fish and Wildlife

In partnership with the Corporate Wetlands Restoration Partnership (CWRP) and Delaware Division of Parks and Recreation, Delaware Division of Fish and Wildlife conducted a Diamondback Terrapin (*Malaclemys terrapin*) nesting habitat restoration project in Delaware Seashore State Park in southeastern Delaware. The state park is situated on a barrier beach island bisected by a 4-lane 55 mph road. Ocean dunes lay east of the road and Delaware's inland bays lay to the west. Female terrapins come up each year and make the trek across the road to the dunes to the east and get hit by cars in the process. Fencing was erected in 2002 to decrease the number of turtles killed. The fence was successful but limited nesting habitat options for the turtles that were now confined to the bay side of the road.

A project was conducted to see if terrapins would use human-created nesting habitat. The project included importing over one thousand tons of sand to create approximately 0.25 acres of nesting habitat. The sand was shaped into a dune configuration and monitored for use by terrapins. To determine the effectiveness of the effort, DNREC conducted a two-year study comparing this site, as well as another habitat created by the Delaware Department of Transportation to mitigate for lost nesting habitat, to six other established nesting sites in the vicinity of the two habitat creation sites. A chi-squared test comparing proportion of nests that hatched one or more eggs showed no significant difference among new and existing nesting sites, indicating that the newly created sites were equally as successful as others monitored. This project was funded by DNREC, CWRP and the Wildlife Conservation Restoration Program (a USFWS grant program).

District of Columbia Department of the Environment

The Eastern Box Turtle (*Terrapene carolina carolina*) is listed as a Species of Greatest Conservation Need (SGCN) in the District of Columbia. The species is declining throughout its range. A small population of *T. c. carolina* was identified at a site in the northeast portion of Washington, D.C. by the District Department of the Environment, Fisheries and Wildlife Division while conducting routine inventory and monitoring surveys. The site is scheduled for development that will remove the existing forested habitat.

As a part of mitigation efforts, the Fisheries and Wildlife Division worked with the developer to undertake a project: *Herpetofauna Inventory and Monitoring in the District of Columbia: Radio-Telemetry of Relocated Eastern Box Turtles* (*Terrapene carolina carolina*). The Division staff captured and relocated *T. c. carolina* to a similar habitat site nearby to protect and conserve individuals. Given the tendency of *T. c. carolina* to demonstrate a homing response, the relocated turtles have been fitted with radio-transmitters and were marked for individual recognition. Their movements are being tracked on a regular basis in an effort to protect the relocated turtles and determine their movement patterns. Future efforts will include a long-term monitoring plan to monitor the establishment of home ranges and ensure species survival.



Eastern Box Turtle, by Andy Adams.

Florida Fish and Wildlife Conservation Commission

Florida's conservation plan for the Gopher Tortoise was implemented in 2007 when it was approved by the Florida Fish and Wildlife Conservation Commission (FWC). The plan includes four conservation objectives to help sustain viable populations of Gopher Tortoises well into the future. These objectives include increasing habitat management and restoration activities, protecting additional acres of habitat on public and private lands, restocking Gopher Tortoises where populations have been depleted, and ensuring all Gopher Tortoises are relocated out of harm's way prior to commencement of development activities. Some highlights of Florida's



A young Gopher Tortoise on its daily rounds. Photo by Andrew Grosse.

accomplishments include increased capacity for habitat management and restoration and implementation of research and monitoring projects.

This year, we have been successful in ensuring habitat management and restoration on more than 50,000 acres throughout Florida. Continued partnerships with The Nature Conservancy's Fire Strike Team program through the State Wildlife Grant (SWG) program will provide management assistance and prescribed fire for 60,000 acres of sandhill and scrub habitats in Florida over the next four years. Ongoing partnerships with Georgia, Alabama, Project Orianne, Gulf Coastal Plain Ecosystem Partnership (GCPEP), and through the multi-state sandhills SWG grant will continue to benefit tortoises and commensals throughout their range. FWC has partnered with many Florida counties and municipalities to improve Gopher Tortoise habitat on county- and city-owned conservation lands. Since implementation, 21 local government projects have been funded helping to manage 2,380 acres of Gopher Tortoise habitat, and we expect to expand this program.

Monitoring efforts of Gopher Tortoise populations on lands managed by the FWC has shown positive results when looking at the population response to specific habitat management activities. A fifteen-year monitoring study (1994-2009) of the Gopher Tortoises on Jennings State Forest Wildlife Management Area during longleaf pine restoration showed an increase of nearly 50% in the estimated population (counting active and inactive burrows). These results suggest that the Gopher Tortoise population has responded in a positive manner to improved habitat conditions.

A multi-year monitoring effort is currently underway at Guana River Wildlife Management Area to evaluate the effect on Gopher Tortoise populations to coastal scrub

habitat managed using mechanical equipment. Coastal scrub habitat experiences fewer naturally occurring fires, which presents a challenge for land managers. This case study will evaluate the effectiveness of mimicking fire with mechanical equipment techniques to create appropriate vegetative conditions for Gopher Tortoises and other native species. These projects will help inform future management decisions.

Georgia Department of Natural Resources

In June 2009, Georgia and three neighboring states received a \$1 million federal grant to increase the quality, quantity and connectivity of prime sandhill habitat. The three-year project was aimed at benefiting Gopher Tortoises and as many as 54 other sandhill species that need significant conservation measures. Georgia, Alabama, Florida, South Carolina and groups such as The Orianne Society, The Nature Conservancy and the Gopher Tortoise Council provided \$1.66 million in matching money and work for the U.S. Fish and Wildlife Service grant, part of the State Wildlife Grants Competitive Program. Plans called for increasing prescribed fire, removing non-native sand pines and overgrown hardwoods, and thinning pine plantations. These efforts are critical to the open canopy and diverse herbaceous groundcover typical of healthy longleaf pine, turkey oak-dominated sandhills. The overriding goal: Restore nearly 40,000 acres of priority public and private sandhill sites, rebuilding habitat for the tortoise and other priority species. The project could help keep Gopher Tortoises off federal endangered or threatened species lists and set the stage for long-term conservation of sandhills species. One year in, the states and partners have made excellent progress. Teaming with The Nature Conservancy of Georgia, the Georgia Department of Natural Resources conducted prescribed fires on 4,700 acres at high-priority sandhills sites across the Coastal Plain, including Yuchi Wildlife Management



Gopher Tortoise in its burrow. Photo by Amanda Ebenhack.

Area, Ohoopsee Dunes Natural Area, Fall Line Sandhills Natural Area, and private lands in Marion, Taylor, Talbot and Bryan counties. Also, non-native sand pines have been removed or sold for cutting on nearly 1,000 acres of state and private lands. At Ohoopsee Dunes in Emanuel County, prescribed fire was conducted on more than 1,000 acres. Many of the areas had not seen fire in many years, leading to buildups of woody underbrush and suppression of grassy groundcover. Shan Cammack with the DNR's Nongame Conservation Section planned and led the prescribed fires. "Careful planning and execution produced successful entry burns at Ohoopsee Dunes this year," Cammack said. "With strategic ignition, drier sparse areas were burned hotter while sensitive areas with heavy fuel loads and duff were burned cooler." During the project's first year, ecological restoration was initiated on more than 15,000 acres in Alabama, Georgia, and Florida. The grant also includes monitoring tortoise populations to track progress, which has been contracted out to the Jones Ecological Research Center and is headed-up by Dr. Lora Smith.

Although it will be many years before any detectable trends can be statistically evaluated, it seems likely that these restoration efforts will enhance tortoise populations in Georgia and adjacent participating states.

Kentucky Department of Fish and Wildlife Resources

The Alligator Snapping Turtle (*Macrochelys temminckii*) is the largest freshwater turtle in North America. Over the past decade, conservation concern for this species has arisen, particularly in the southern portion of the range where overharvest was known to occur. The status of this long-lived species is unknown in Kentucky since very few distribution records exist, and no records have been reported since 2005. Beginning in 2009, the Kentucky Department of Fish and Wildlife initiated a project using State Wildlife Grant funding to conduct a status assessment for the Alligator Snapping Turtle throughout its historic range in the state. Agency biologists have compiled all historic Alligator Snapping Turtle records for Kentucky and are in the process of conducting surveys at all accessible sites, and within oxbow lakes along the Mississippi and Ohio Rivers. Hoop net traps baited with fresh carp are being deployed, and all turtle species of greatest conservation need captured are uniquely marked, weighed, measured, and released at the site of capture. If Alligator Snapping Turtles are observed in a given area, extensive trapping efforts will be initiated in an attempt to assess population status. The overarching goals of this

project are to: 1) Identify if Alligator Snapping Turtle populations persist in Kentucky and, if populations are found; 2) Implement efforts to maintain/increase habitat quality where these turtles persist. If Alligator Snapping Turtle populations are found, state agency biologists can move forward with directed conservation efforts (for example, elevating watersheds harboring these turtles to a high priority for restoration efforts).

To help in tracking the distribution and status of Kentucky's turtles and other herpetofuana, visit <http://fw.ky.gov/navigation.aspx?cid=829&navpath=C741>.



Yes, they do bite! Alligator Snapping Turtle photo by Joshua Ream.

Louisiana Department of Wildlife and Fisheries

During 2011, the Louisiana Department of Wildlife and Fisheries (LDWF) has committed to a cornucopia of chelonian conservation causes. This year LDWF will receive 200 Alligator Snapping Turtle hatchlings donated by Concordia Turtle Farm L.L.C. These will be the first reared by the Department's fledgling headstarting program. Surveys for this species that are currently being conducted in southwest Louisiana and future surveys in other areas will determine the best sites for the restocking efforts. Map turtles are receiving a lot of attention from our biologists as well this year. In southeast Louisiana, a monitoring and population estimation project for the federally threatened Ringed Sawback (*Graptemys oculifera*) and the recently described Pearl River Map Turtle (*Graptemys pearlensis*) is in progress. The Sabine Map Turtle (*Graptemys sabinensis*), which occurs in the western part of the state, is receiving similar treatment. Along the coast, LDWF is looking at potential impacts on Diamondback Terrapins (*Malaclemys terrapin*) from the Gulf oil spill as well as assessing its distribution and abundance in areas not affected by the spill. Further offshore, our sea turtles are also being assessed by Louisiana in conjunction with other state and federal

natural resource trustees for impacts resulting from the 2010 Deepwater Horizon oil spill. Last but not least, a project to improve the habitat and calculate the burrow occupancy rate of our threatened, terrestrial, tunneling tortoise (Gopher Tortoise, *Gopherus polyphemus*) is currently underway.

Mississippi Department of Wildlife, Fisheries & Parks

The Mississippi Museum of Natural Science, a division of the Department of Wildlife, Fisheries, and Parks, celebrated “Turtle Day” on July 5 as part of the agency’s efforts to publicize Year of the Turtle. Turtle Day included activities for families which introduced the public to Mississippi’s diverse turtle fauna and the plight of turtle species within the state and throughout the world. Other activities included a lecture on the status of the Gopher Tortoise on Camp Shelby, a Mississippi National Guard facility in south Mississippi, which has an active conservation program for the species. The Year of the Turtle and endangered turtles in Mississippi were also discussed by Department staff on the weekly Mississippi Public Broadcasting radio program “Creature Comforts” on June 30.

The Mississippi Department of Wildlife, Fisheries, and Parks is conducting several turtle projects within the state. Long-term monitoring of *Graptemys oculifera*, the Ringed Sawback, in the Pearl River has been ongoing since 1988. This project, which involves an evaluation of population sizes at five sites using mark-recapture techniques, is also providing data on growth and survivorship of this species. Another project involving the genus *Graptemys* is being conducted on the Tennessee-Tombigbee Waterway. The Waterway connects the Tennessee River, where *G. ouachitensis*, the Ouachita Map Turtle, is a relatively common species, with the Tombigbee River watershed, where *G. nigrinoda*, the Black-knobbed Sawback, is relatively common. The agency is interested in learning if either or both of these species are moving up or down the Waterway into the range of the other species and what the long-term results of these movements, if

they occur, will be. Other agency projects with turtles include moving Gopher Tortoises that have been found either injured or in inappropriate habitat, such as in urban areas or outside of their known range, to more appropriate habitats, and closely monitoring turtle farms that operate under the agency’s permitting system.

Missouri Department of Conservation

A domestic market and a nearly insatiable foreign market for turtle meat, shells, pets, and other products are driving commercial turtle collection in numerous states including Missouri. The specific effects of this collecting activity on the populations of the three species that can be legally harvested in the channels of the Missouri River, Mississippi River, and St. Francis River border waters with Arkansas are not currently known. The Missouri Department of Conservation has initiated a project to

address this gap: Effects of Commercial Harvest on Turtle Demographics (Common Snapping Turtle, *Chelydra serpentina*; Spiny Softshell, *Apalone spinifera*; and Smooth Softshell, *Apalone mutica*) in the Missouri River. Models based on studies of other turtle populations suggest that the demographic characteristics of turtle populations (high egg and hatchling mortality, delayed maturity, long-lived adults, and other factors) make them unsuitable for sustained commercial harvesting. With studies of turtle populations documenting adult survival rates from 88 to 97 percent, a relatively low number of individuals harvested

may reduce annual survival of adults by 10 percent and, thus, be unsustainable. This and the other studies also predict that the recovery time for depleted populations would be extremely long, even after the causes of the additional mortality have diminished or been eliminated. Due to these concerns, some states have recently initiated bans or placed greater restrictions on commercial harvesting of freshwater turtles.

Current Missouri commercial harvest regulations restrict harvest to the river channels of the Missouri and Mississippi Rivers and the portion of the St. Francis River along the shared Missouri-Arkansas border. Without



L: Spiny Softshell, by Jeff Hall.

R: Smooth Softshell, by Tom Diez.



information on the percentage of turtles that may be taken by commercial methods in Missouri, managers have little information to use when deciding whether current harvest is or is not sustainable and whether existing regulations should be modified. The purpose of this study is to document the effects of commercial harvesting on populations of Common Snapping Turtles, Spiny Softshells, and Smooth Softshells in Missouri. The study will address the following management needs:

1. To determine population characteristics of these three species of turtles including abundance, age, and sex structure on harvested populations in the Missouri River and unharvested populations on the Osage and Gasconade Rivers.

2. To determine the impact of commercial harvesting on the population abundance, size structure, and sex ratio on the harvested populations.

3. To determine the percentage of the population (all stages) that can be legally harvested without reducing population size.

4. To determine if source of origin for the turtle species can be distinguished by use of isotope signatures.



Common Snapping Turtle, by Ann Rogerson Weaver.

Montana Department of Fish, Wildlife & Parks

In a cooperative project that began in 2009 between Montana Fish, Wildlife and Parks, U.S. Fish and Wildlife Service, CMR National Wildlife Refuge, Montana State University, Montana PPL, and the Bureau of Land Management, we have been conducting a detailed study to augment the baseline information recently collected on Spiny Softshell turtles. Using radio transmitters, we are working to describe daily and seasonal movements and determine the size of home ranges. We are attempting to determine spring, summer, nesting, and overwintering habitat preferences. We are also describing terrestrial characteristics of nesting site selection and timing of nesting in relation to river flow and water and air temperature. In addition, we are observing and describing Spiny Softshell nesting behavior. All of this work is being conducted on the Missouri River above Fort Peck Reservoir.

New Hampshire Fish & Game Department

The NH Fish & Game Department was recently awarded a nationally competitive State Wildlife Grant for the Conservation of Blanding's Turtles (*Emydoidea blandingii*) and associated wetland Species of Greatest Conservation Need (SGCN) in the Northeast. The objective of the

Blanding's Turtle basking, by Melanie Foose.



project is to maintain and enhance functional wildlife habitat in New England, New York, and Pennsylvania by applying conservation principles and practices needed to support a healthy Blanding's Turtle population. In the short-term, project partners will cooperate to develop a spatially-explicit conservation plan for Blanding's Turtles and associated SGCN in the northeastern United States, initiate standardized monitoring of the species' status, assess management units through genetic analysis, and initiate implementation of the Plan by managing habitat to reduce road mortality and engaging key partners to prioritize land acquisition, restoration, and management activities. In the long-term, conservation partners will apply information developed through this grant to maintain viable populations of Blanding's Turtle and associated SGCN in the Northeast through cooperative land protection, restoration, and habitat management.

Northeast PARC identified Blanding's Turtle as one of the highest priority reptile and amphibian species in the Northeast and recommended the development of a species-specific conservation plan across state lines. Project partners include: four other state wildlife agencies (MA, ME, NY, PA), three universities (University of Massachusetts-Amherst, University of Maine-Orono, State University of New York), the USFWS, NRCS offices and state transportation departments from each state, and multiple private and non-profit groups.

New York Department of Environmental Conservation

New York State and other northeastern states were recently awarded a Competitive State Wildlife Grant for

Blanding's Turtle conservation work in the northeast. The Blanding's Turtle is threatened or endangered in most northeastern states and limited efforts to help restore populations have taken place. The project will focus on many priority actions for the Blanding's Turtle, including the development and implementation of a standardized monitoring protocol, development and implementation of long-term management strategies, creation or enhancement and monitoring of nesting habitat use, and the implementation of a turtle crossing sign program aimed at reducing road mortality. Road mortality is one of the biggest threats to turtle populations in the northeast, especially during times of peak movement activity coinciding with nesting. With such high densities of roads in the region, turtles frequently have to cross roads to nest in uplands. In addition, some individuals may even be attracted to roadsides as these areas may provide suitable nesting habitat. If creating or enhancing nesting habitat near hotspots of turtle road mortality is effective at keeping turtles from crossing roads and risking collisions with motor vehicles, it may be possible to create artificial nest sites to mitigate the effects of road mortality on turtle populations. In addition, partners plan to test whether turtle crossing signs may be effective at reducing turtle mortality along roads. If effective, the signs may be an inexpensive alternative to building safe passage structures to mitigate the effects of road mortality on local turtle populations.



L: Common Snapping Turtle, by Ann Rogerson Weaver.

R: Wood Turtle, by Kyle Loucks.



North Dakota Game and Fish Department

Very little is currently known about the status of Snapping Turtles in North Dakota but information from various investigations suggests that long-term sustainability of snapping turtles may be less certain for populations in the more northerly portions of their range. For that reason the Snapping Turtle is listed as a species of conservation priority in North Dakota's Wildlife Action Plan. Over the next three years the North Dakota Game and Fish Department will partner with the University of Idaho to conduct a study: *Population and Status Assessment Strategies Applied to a Management Plan for the*

Snapping Turtle (Chelydra serpentina) in North Dakota, to determine the population and status of Snapping Turtles in North Dakota with the goal of developing a long-term management plan through the State Wildlife Grants program.

Survey efforts will be a combination of brief two-day surveys to verify distribution and longer intensive sampling at select locations for population assessment. All turtles captured will be measured for carapace length, weighed, and identified externally as to sex. Turtles will be tagged with disk tags and released alive.

Currently there is a need to have a Management Plan for Snapping Turtles in North Dakota that is based on an understanding of the status of the species and factors affecting adult mortality, nesting success, juvenile survival and recruitment. This study proposes to begin to develop the necessary information on population demographics and ecological factors affecting the demographics. This study also proposes to develop a long-term approach for assessing the status of turtles that can be incorporated into ongoing NDGFD annual sampling for fishes in selected waters statewide.

Virginia Department of Game and Inland Fisheries

The Wood Turtle (*Glyptemys insculpta*) is one of several North American turtles that has been severely impacted by human encroachment and yet remains understudied relative to the degree of threat and increasing pace of range contraction. Wood Turtle population viability is particularly sensitive to human encroachment, even among turtles, because they are equally dependent on both aquatic and terrestrial habitats, they move across the landscape daily and seasonally and may occupy large home ranges (ca. 100 ha). In Virginia, where the Wood Turtle reaches the southern margin of its distribution, it is listed as "State Threatened" primarily due to natural rarity and loss of habitat. It is also considered a Tier 1 species in Virginia's Wildlife Action Plan.

From 2010 to 2014, with funding from a State Wildlife Grant, researchers from the Virginia Department of

Game and Inland Fisheries and Longwood University will conduct a study: *Determinants of Nest Success, Hatchling Survival, and Recruitment for the Wood Turtle (Glyptemys insculpta) in Virginia*. This purpose of the study is to monitor and record the fate of 1) egg-bearing females through the nesting season until at least egg laying; 2) nests until depredation, hatching, or failure; and 3) hatchlings until depredation, turtle mortality, or the onset of the aquatic activity phase. Data collected with these approaches will inform decisions on the need, utility, and feasibility of nest protection, head-starting, and the creation of artificial nest sites. Because these tools could possibly benefit the long-term conservation of Wood Turtle populations in Virginia, it is necessary to first collect baseline ecological data to identify the precise and most effective applications. Information gained from this project will also be used as an informational basis for VDGIF management recommendations to the U.S. Forest Service, other federal and state agencies, non-governmental organizations and private landowners.

Name That State's Turtle: Answers

Desert Tortoise: California, Nevada
Gopher Tortoise: Georgia
Loggerhead Sea Turtle: South Carolina, Florida
Eastern Box Turtle: North Carolina, Tennessee
Ornate Box Turtle: Kansas
(Alabama) Red-bellied Turtle: Alabama
Snapping Turtle: New York
Diamondback Terrapin: Maryland
Painted Turtle: Vermont, Michigan, Colorado, Illinois
Three-toed Box Turtle: Missouri

Upcoming Meetings and Events

American Museum of Natural History's Southwestern Research Station course on field herpetology, July 24 - August 3, Portal, Arizona.

Midwest PARC Annual Meeting, August 5-7, Lesterville, Missouri

Ecological Society of America 96th Annual Meeting, August 7-12, Austin, Texas.

SW PARC Annual Meeting, August 10-11, Tucson, AZ

9th Annual Symposium on the Conservation and Biology of Tortoises and Freshwater Turtles. Co-hosted by the Turtle Survival Alliance and the IUCN Tortoise and Freshwater Turtle Specialist Group. August 14-17, Orlando, Florida.

Current Research in Sonoran Desert Herpetology V Symposium, August 15-16, Tucson, Arizona.

Northeast PARC Annual Meeting, August 16-17, Millersville, Maryland.

Society for Ecological Restoration International World Conference. August 21-25, Merida, Mexico.

The Wildlife Society, Central Mountains and Plains Section Meeting. August 23-25, Gering, Nebraska.

Hatching Diamondback Terrapins Field School, Massachusetts Division of Fisheries and Wildlife, September 9-11, Wellfleet, Massachusetts.

Wild About Turtles, MassAudubon's Broadmoor Wildlife Sanctuary, September 11, Natick, Massachusetts.

Association of Fish and Wildlife Agencies 101st Annual Meeting, September 11-14, Omaha, Nebraska.

Association of Zoos and Aquariums Annual Conference, September 12-17, Atlanta, Georgia.

Societas Europea Herpetologica (SHE; European Congress of Herpetology) and Deutsche Gesellschaft für Herpetologie und Terrarienkunde (DGHT; German Herpetological Society) Joint Conference, September 25-29, Luxembourg and Trier.

Wetland Restoration Workshop, September 25-30, Olympia, Kentucky.

The Wildlife Society 18th Annual Meeting, November 11-13, Waikoloa, Hawaii.

International Congress for Conservation Biology, Society for Conservation Biology, December 5-9, Auckland, New Zealand.

PARC Regional Working Group Spotlight: Northeast PARC Turtle News



Eastern Box Turtle, Terrapene carolina carolina, by Amberly R. Moon, Virginia Commonwealth University.

Northeast PARC (NEPARC) has a long history with turtle conservation and education efforts. We currently have two working groups that focus on particular species of northeast turtles (following descriptions are from the NEPARC website). The Box Turtle Working Group was formed at the 2005 NEPARC meeting. Since then the group has compiled and developed educational materials that will help efforts to conserve the Eastern Box Turtle. Project examples include producing a postcard encouraging people to leave Box Turtles in the wild, developing an informational webpage to direct people to existing educational materials, and compiling a list of veterinarians and wildlife rehabilitators who work on turtles. For 2010 the group will be working on Box Turtle release guidelines for native wild turtles temporarily held in captivity (e.g., for rehabilitation) and a box turtle identification and comparison key. At the 2009 NEPARC meeting, the Wood Turtle Working Group was formed to create a forum to discuss the conservation issues surrounding the Wood Turtle (*Glyptemys insculpta*). Over 20 people attended this inaugural meeting. State, federal, nonprofit, academia, and private interests were all represented. Five issues emerged as priorities for the group to address: state-by-state status, NatureServe ranking, monitoring protocols, integrating Canada and MWPARC, and the role of non-profit organizations. Of these issues, the following tasks to be completed over the next year were identified: contact Canadian representatives, investigate the feasibility of a Wood Turtle Status Assessment, identify a point person from each state, develop monitoring protocols, identify NGOs that may be of assistance, and develop an educational brochure.

Here are a few projects that are going on in the Northeast Region that we would like to highlight:

Spiny Softshell Turtles

I am working with colleagues at the University of Vermont in cooperation with the VT Fish & Wildlife Department on efforts for conservation of the Threatened (state listed) Eastern Spiny Softshell Turtle (*Apalone spinifer*). Dr William Kilpatrick and I have been developing and analyzing three sets of genetic markers for the species in an effort to assess the genetic identity of the Lake Champlain population of Spiny Softshell Turtles. We plan to determine the number of subpopulations within the lake, the effective size of those populations, the migration rate between populations, and to measure the genetic diversity contained within the Champlain Spiny Softshell Turtle population. Field efforts aim to discover, manage, and protect nesting beaches and hatchlings along the Vermont side of the Lake Champlain shore. - *Luc Bernacki, University of Vermont*



Spiny Softshell Turtles captured for radio tracking. Photos by Jed Merrow.



The Vermont Agency of Transportation, through the consulting firm McFarland Johnson, is monitoring Vermont state-threatened Spiny Softshell Turtle activity in the Missisquoi Bay area of northwestern Vermont. The purpose of the work is to determine whether the new Route 78 bridge over the bay has affected softshell turtle populations or habitat use. The consultant team is radio-tracking about a dozen turtles, monitoring basking activities, and measuring water quality parameters. Monitoring will continue through spring 2012. - *Jed Merrow, Project Manager, McFarland Johnson*

Bog Turtles

The northern population of the Bog Turtle (*Glyptemys muhlenbergii*) is federally threatened primarily because of the lack of suitable wetland habitat within the Northeast. Although managers attempt to protect and restore suitable habitat, little is known about habitat preferences, especially in reference to nesting. Fordham University PhD student Suzanne Macey is studying the nesting ecology and conservation of the federally threatened Bog Turtle in New York State. Her current project includes radio-tracking gravid females to nest sites and recording vegetation composition, structure, and nest temperature to determine nest-site selection. Preliminary results of this study have been used to ground-truth nesting habitat monitoring protocols developed by The Nature Conservancy Eastern New York State Chapter. Additionally, the data collected on nest-site selection, temperature, hatching rates, and depredation rates will be used to help inform the USFWS five-year status review of the recovery plan of the northern population of the bog turtle. - Suzanne Macey, PhD Student, Fordham University



Bog Turtle, by
Suzanne Macey

I am working on a two year grant from USFWS to try to find additional Bog Turtle sites in western and central New York State. The Recovery Unit that I live in, the Prairie Peninsula/Lake Plains Recovery Unit, has only 5 known extant sites for Bog Turtles, and the Recovery Plan calls for the protection of at least 10 sites.

In 2010 and 2011, I have been surveying 130 wetlands in Wayne and Cayuga Counties of New York that I identified by remote sensing (aerial photos, soil maps, wetland maps, and NYS Natural Heritage data), to see if they do or do not have suitable habitat for bog turtles. Each site is evaluated as one would in a Phase I Bog Turtle Survey. To date, we have found about 5 sites that need further evaluation. Unfortunately, cultural eutrophication due to farming and development has modified many sites that were perhaps once suitable for Bog Turtles into what are now cattail, Phragmites or Reed Canary

Grass wetlands no longer suitable for Bog Turtles. – Peter Rosenbaum, SUNY Oswego



Box Turtle
with iButton
temperature
data logger
attached.
Photo by
Amberly R.
Moon.

Box Turtles

In 2008, 20 captive-bred juvenile Eastern Box Turtles (*Terrapene carolina carolina*) were brought to the VCU Walter and Inger Rice Center, Charles City County, VA for a head-start relocation study. The study was conducted to determine the effects of using a penning treatment (methodology by Tracey Tuberville) for relocation of this species. Ten of these individuals were placed in a 736 m² pen for one year, while the other ten individuals were released without any treatment. This study found reduced movement patterns in the pen-treated turtles compared with not-pen-treated turtles, and 87.5% site fidelity for both treatments in the study.

In 2009, the remaining 15 juvenile Box Turtles were included in a wintering ecology study along with 13 adult resident Box Turtles. We compared temperature tolerance, microhabitat selection and philopatry of hibernacula between the two groups. We attached iButton temperature data loggers to each individual and recorded the temperature every 3 hours from November to May. We found that adults had significantly higher minimum temperatures and later emergence dates than the juveniles for one of the winters studied. For our vegetation analysis we used the One-tenth Acre Circular Plot method around each occupied turtle hibernaculum and 10 randomly generated unoccupied plots. We found random unoccupied plots to have slightly greater percentages of shrub and canopy cover than occupied turtle hibernacula, suggesting this species may select overwintering habitat with more direct sunlight for temperature regulation. We also found that adults had slightly greater amounts of downfall around their hibernacula than juveniles. Our study site is fairly homogeneous and our sample size is small, so further study is needed to gather more

information on microhabitat selection by this species.

Seven of our 28 turtles returned to previous hibernacula from <1 to 15 m. We found that 60% of the variation of the distance between previous hibernacula could be explained by age and home-range size. The larger the home-range size, the further the distance between previous hibernacula, because in a smaller area there is a greater chance of hibernating in close proximity to a previous location. Juveniles had greater distances between hibernacula than adults even though they had significantly smaller home-ranges. Even though this species appears to exhibit philopatry of its hibernacula, home-range size must be taken into account before attributing it to site fidelity. - Amberly R. Moon, Virginia Commonwealth University, Dept. of Biology



Blanding's
Turtle, by Simon
Pelletier

Blanding's and Spotted Turtles

For nearly 20 years, Maine's Department of Inland Fisheries and Wildlife (MDIFW) has actively researched the distribution and status of Blanding's and Spotted Turtles in Maine (along with Maine's other five turtle species). Blanding's Turtles (*Emydoidea blandingii*, State Endangered) and Spotted Turtles (*Clemmys guttata*, State Threatened) are high conservation priorities due to their southerly distribution in Maine (which overlaps the highest human population in the state) and use of both wetland and upland habitats. MDIFW is currently involved in three active conservation projects benefitting Blanding's and Spotted Turtles:

- Cautionary Road Signage Project (Turtle X-ing): A cooperative study by the University of Maine and MDIFW identified high-density rare turtle areas with road-crossing hotspots. With the assistance of the Maine Department of Transportation (DOT), The Nature Conservancy, and local towns, temporary yellow warning signs were installed in strategic locations to alert motorists to the possible presence of turtles on the roadway. The signs are deployed seasonally, coinciding with the period when overland turtle movements are greatest, thus helping to maximize the signs' impact by

reducing "sign fatigue" among local commuters. This project is now in its 6th year.

- Wildlife Road Watch: Partnering with Maine Audubon and Maine DOT, a volunteer initiative to report wildlife-road interactions (both alive and dead) was launched in 2010. Data generated from this project may help in planning future projects and identify mitigation efforts (e.g., additional signage areas, critter crossings, etc.). In addition to incidental sightings, participants may also choose to adopt a road segment for repeated monitoring. For more information on the Wildlife Road Watch, please visit: www.wildlifecrossing.net/maine/
- Conservation of Blanding's Turtle in the Northeast: MDIFW along with four other Northeastern states (MA, NH, NY, & PA) and numerous partners were just awarded a Competitive State Wildlife Grant to develop a regional model and plan for Blanding's Turtles. This work includes genetic analysis of populations, development of standardized regional monitoring protocols, and development and implementation of identified priority actions (e.g., signage, artificial nesting area construction) at sites in each of the participating states. Planning is currently underway with most of the field work slated to begin in spring, 2012.

- Jonathan Mays, Reptile, Amphibian, & Invertebrate Group Maine Dept. of Inland Fisheries & Wildlife

Spotted Turtle, by
Andy Adams



Wood Turtles

Due to natural rarity at the edge of their range and the effects of human encroachment across the northern Virginia landscape, Wood Turtle populations have declined and disappeared in Virginia, particularly over the last 20 years. The Wood Turtle has been listed as "Threatened" in the Commonwealth for nearly that same time—since 1992—and is a Tier 1 species for conservation action. Wood Turtle occupancy surveys have long been a part of the Virginia Department of Game and



Emerging Wood Turtle hatchling in a protected nest. Photo by Thomas Akre.

Wood Turtle depositing eggs in a nest dug into a road-side embankment. Photo by Thomas Akre.



Inland Fisheries' monitoring protocol, and a comparative demography and habitat use study was undertaken by Akre and Ernst (2006). As their range becomes contracted in Virginia, it may become increasingly important to maintain a metapopulation network in protected areas, such as national forests. With this purpose in mind, we recently began to investigate factors that influence nest site selection, nest and hatchling behavior, movements, and survival in a montane population on the national forest. As of July 2010, we have used telemetry and thread-spools to monitor approximately 50 females

across two nesting seasons, and locate approximately 80 nests. Each nest was compared to a set of controls for analysis of standard nest parameters, including substrate temperature and relative humidity, using hygrometers. A subset of nests has been monitored by remote motion/infrared sensitive cameras for depredation and human disturbance (i.e., vehicles, horses, etc.). Data from our first year suggest that in small stream valleys, such as our principal study site, Wood Turtles select road-side embankments for nesting in lieu of sand or gravel banks, and that nest survival can be relatively high (ca. 83%) in the absence of depredation and human disturbance. In addition, while predation at this site does not appear to be a major factor, road maintenance and recreational use may be important determinants of nest success. Presently, we are in the process of collecting data from our second nesting/emergence field season for interannual comparison of selection and survival. Next year, we will extend our monitoring of nests and hatchlings to further investigate the effects of predation, land management, and recreational use on survival and recruitment of these sensitive life stages. - *Thomas Akre, Professor of Biology, Longwood University, Farmville, VA.*

Year of the Turtle T-shirts

NEPARC is now offering Year of the Turtle t-shirts. Orders being accepted from now till August 3rd will ship in August. If there is enough interest, we may do a second round after this order period closes. Men's and women's styles available, see link for design, price, and additional information: www.northeastparc.info/Home_Page.html.

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