Banquet Speaker: David Carroll

Naturalist-artist David M. Carroll, who in 2006 was named a MacArthur Foundation Fellow, is the author of three acclaimed natural histories: THE YEAR OF THE TURTLE; TROUT REFLECTIONS; and SWAMP-WALKER’S JOURNAL. The latter was awarded the John Burroughs medal for distinguished nature writing. This “wet-sneaker trilogy” was expanded to a quartet with the publication of his memoir centered on his lifelong connection with turtles and their habitats, SELF-PORTRAIT WITH TURTLES.

His fifth book, FOLLOWING THE WATER, A HYDROMANCER'S NOTEBOOK, published by Houghton Mifflin Harcourt in August 2009, was awarded a Finalist Medal in the nonfiction category by the National Book Foundation. David is a graduate of the School of the Boston Museum of Fine Arts and Tufts University. He has received an Honorary Doctorate of Humane Letters from the University of New Hampshire and an Honorary Masters in Environmental Science from New England College.

In addition to his own field work, David has conducted investigations for the Endangered Species programs of New Hampshire, Vermont, and Maine; as well as for such agencies as the U.S. Environmental Protection and the National Park Service. His fieldwork has been published in scientific journals, including Chelonian Conservation and Biology and Northeastern Naturalist.

David and his work have been the subject of numerous articles and interviews, and his artwork has been widely exhibited. He is an active lecturer and turtle and wetlands preservation advocate; among awards he has received are an Environmental Merit Award from the U.S. EPA and NH Audubon’s Tudor Richards Award.

Life on the Edge – Regional Turtles of Concern

Title: Regional Planning Programs for Two Rare Turtle Species in the Northeast

Authors: Lisabeth L. Willey*, lwilley@cns.umass.edu, Michael T. Jones, and Paul R. Sievert, U.S. Geological Survey, Massachusetts Cooperative Fish and Wildlife Research Unit, University of Massachusetts, Amherst, MA 01003; Thomas Akre, Longwood University; Christina Castellano, Orianne Society; Lori Erb, Massachusetts Division of Fisheries and Wildlife; Mark Grgurovic, Swampwalkers Wetland Ecosystem Specialists; Glenn Johnson, State University of New York Potsdam; Stephanie Koch, U.S. Fish and Wildlife Service; Michael Marchand, New Hampshire Fish and Game; Jonathan Mays, Maine Inland Fisheries and Wildlife Department; Angelena M. Ross, New York State Department of Environmental Conservation; Chris Urban, Pennsylvania Fish and Boat Commission; Bryan Windmiller, Hyla Ecological Services.
Abstract: Blanding’s turtle (*Emydoidea blandingii*) and wood turtle (*Glyptemys insculpta*) are long-lived Northeastern emydid turtles that rely seasonally on both wetland and upland habitats, are listed as “Endangered” by the IUCN, and are of regional conservation concern. Both species are apparently threatened by direct habitat loss and elevated adult mortality rates, and population declines have been documented for both species. To improve the effectiveness of conservation efforts, formal working groups for both species were established or maintained within the NEPARC organizational context to prioritize and coordinate conservation, management, and monitoring activities throughout the Northeast region. In 2011, the Blanding’s Turtle and Wood Turtle Working Groups received funding through State Wildlife Grants programs (USFWS Competitive SWG, and NEAFWA Regional Conservation Needs, respectively), and key contributors include biologists and land managers from agencies, universities, NGOs, and private industry from 5 and 12 states, respectively. Efforts are underway to identify priority sites for conservation and management, develop management plans for priority sites, implement standardized regional monitoring programs, and establish meaningful and productive partnerships with additional agencies, land-trusts, and managers. As part of this effort, we have devised a two-tiered regional monitoring strategy that utilizes 1) broad-scale occupancy and abundance sampling to detect population trends across the region, and 2) spatial mark-recapture methods to estimate population density at key sites. We will discuss the details of these plans as well as preliminary results from spring 2012 sampling and seek critical feedback on our monitoring approach.

Title: Failure of Maryland’s Regulation to Protect Diamondback Terrapins from Bycatch in Recreational Crab Pots: Compliance, Enforcement and Retail Shortcomings.

Authors:
Scott A. Smith*, Maryland DNR-Wildlife & Heritage Service, PO Box 68, Wye Mills, MD 21679, sasmith@dnr.state.md.us; Craig A. Patterson, Towson University, Dept. of Biological Sciences, Towson, MD 21252, cpatte7@students.towson.edu; Roman Jesien, Maryland Coastal Bays Program, 9919 Stephen Decatur Highway – Suite 4, Ocean City, MD 21842, rjesien@mdcoastalbays.org

Abstract: Mortality from bycatch in crab pots is one of the greatest threats to diamondback terrapin (*Malaclemys terrapin*) populations. In 1999, Maryland passed regulations requiring all recreational crab pots be fitted with bycatch reduction devices (BRDs) to exclude terrapins. In 2009, we investigated public compliance, enforcement, and bait shop awareness of the regulation. We examined 269 recreational crab pots in 4 study areas in the Chesapeake and Atlantic coastal bays and found only 21.9% fitted with BRDs. An independent sample of 120 pots seized for non-BRD violations was also examined with only 18.3% fitted with BRDs. The Natural Resource Police (NRP) database revealed that from 2003-2008 only 1 citation and 37 written warnings had been issued. Lastly, a phone survey of 75 bait shops in Maryland indicated that 29 sold both crab pots and BRDs, 34 sold neither, 10 sold only crab pots, and 2 sold only BRDs. Of the 39 that sold crab pots, 25.6% did not sell BRDs nor had knowledge of the regulation. In summary, the BRD regulation was not being followed by the public nor enforced
by NRP, and a notable proportion of bait shops had no knowledge of the regulation. DNR and partners began an educational effort to inform the public, bait shops, and NRP on this regulation. A follow-up study is planned in 2012 to assess progress. Banning this gear type by recreational crabbers is a management option currently being discussed.

Title: Spiny Softshell Turtle Monitoring Results from the Missisquoi Bay Bridge Project

Author: Jed S. Merrow, McFarland Johnson, 53 Regional Drive, Concord, NH 03301; jmerrow@mjinc.com

Abstract: Vermont state-threatened spiny softshell turtles (*Apalone spinifera*) and their habitat have been monitored over the course of eleven years as part of a bridge replacement project in Vermont’s Missisquoi Bay, in northern Lake Champlain. Most of the local population hibernates in the vicinity of the bridge and basks on the causeways that led to the old bridge. The new bridge was constructed in 2005-2007 over a portion of the hibernaculum and adjacent causeway basking habitat. Spiny softshells have been radio tracked in this area since 1996, and starting in 2001 turtle basking activities and water quality were also monitored. Monitoring will end in spring 2012. The purpose was to obtain baseline pre-construction information on the population, its use of the bridge project area, and water quality conditions; and to assess whether construction activities or post-construction conditions have affected the turtle population or their activities.

Radio tracking showed that individual spiny softshells follow a regular seasonal movement pattern, using the same hibernaculum; spring/early summer habitat; mid to late summer habitat; and fall basking habitat each year. The turtles range widely over the course of a year, and seasonal and even daily movements can be extensive. Most turtles hibernate in the bridge project area lined up along the main channel. Turtle basking activities in relation to temperature and wind conditions have also been explored. Methods for turtle capture and recapture and transmitter attachment have been refined.

Life on the Edge – Regional Amphibians of Concern/Climate

Title: The eastern tiger salamander (*Ambystoma tigrinum tigrinum*) in New York and New Jersey: Planning for Climate Change and Actions to Enhance Survival.

Authors: Dave Golden, New Jersey Division of Fish and Wildlife. 8747 Ferry Road, Millville, NJ 08332. dgolden@hughes.net; Valorie Titus, Wildlife Conservation Society, 2300 Southern Blvd. Bronx, NY 10701. vtitus@wcs.org

Abstract: The state endangered eastern tiger salamander is New Jersey’s rarest amphibian species, with only 15 documented breeding locations existing in the state. Development
pressures, climate change, and sea level rise are all posing threats to these remaining populations. Because habitat for this species is concentrated along the coastal fringe of the Cape May Peninsula, roughly 40% of the state’s documented breeding locations for this species are predicted to be impacted by sea-level rise over the next 50 yrs. New Jersey Division of Fish and Wildlife partnered with several other agencies in an effort to recover this species within its existing range and plan for future changes in habitat resulting from sea-levels rise.

The goal of this project is to establish a stronghold for the eastern tiger salamander in NJ and to assist the migration of this species by expanding and restoring important vernal pool habitats (critical breeding habitats for this species). In 2011, NJDFW identified areas within the existing NJ range of this species that were considered “low risk” for sea-level rise impacts. In fall 2011, NJDFW constructed 10 tiger salamander ponds in this area. Two “head-starting” methods were carried out in 2011: 1) egg masses were transplanted from “fringe ponds” (those at risk from sea-level rise) and raised in cages in new ponds, and 2) egg masses from fringe ponds were hatched at the Cape May County Zoo. Half the head-started larvae were then released into new ponds and half were released into the natal ponds. This is New Jersey’s first project (and is one of the first project’s nationwide) that is implementing on-the-ground habitat management to address the impacts of climate change.

The long-term survival of the New York State endangered eastern tiger salamander is of special concern due to rapid development of its last remaining habitats on Long Island. Understanding the characteristics of ponds and vernal pools utilized by amphibians like the tiger salamander, as well as the upland habitats used throughout the year, is essential to the conservation and proper management of these species. I conducted a radio-telemetric study at Brookhaven National Laboratory on Long Island, New York. Data were collected from 2004 to 2008 at three pond locations. Fifty-nine adults and 49 juveniles were captured and implanted with transmitters. I also collected analyzable genetic samples from individuals from 17 breeding sites across the current breeding range to determine relatedness within this population. These data indicated that this population of tiger salamanders utilize much more upland habitat than the protection allotted at the time of this study and the populations across the island still appear to have similar genetic variability. Though this population appears to be stable, much still needs to be done to maintain this edge species.

Title: Interspecific Competition under Climate Change: Addressing a Critical Science Need for Management of the Federally Endangered Shenandoah Salamander (*Plethodon shenandoah*)

Authors: Eric A. Dallilio*, USGS Northeast Amphibian Research and Monitoring Initiative, Patuxent Wildlife Research Center, Laurel, MD 20708; edallilio@usgs.gov; Evan Grant, USGS Northeast Amphibian Research and Monitoring Initiative, Patuxent Wildlife Research Center, Laurel, MD 20708; egrant@usgs.gov; Adrianne Brand, USGS Northeast Amphibian Research and Monitoring Initiative, Patuxent Wildlife Research Center, Laurel, MD 20708; abrand@usgs.gov
Abstract: The Shenandoah salamander (*Plethodon shenandoah*) is a federally endangered species with a restricted distribution limited to dry talus slopes over 900m in elevation in Shenandoah National Park (SNP). Species such as *P. shenandoah* with specialized habitat requirements at high elevations have the potential to be severely threatened by climate change. Results of previous research suggest that *P. shenandoah* is competitively excluded to suboptimal talus habitats by the red-backed salamander (*Plethodon cinereus*). Resource managers at SNP are considering management for *P. Shenandoah* by initiating a research and monitoring effort with USGS to examine (1) the current distribution patterns of *P. shenandoah* and (2) identify optimal management actions to ensure persistence of the species. A critical uncertainty in this process is understanding how the effects of temperature and humidity influence both the potential to limit distributions of one or both species, and change the nature of the interaction between the species; this research design will investigate these relationships by using innovative three-dimensional mesocosms to examine growth and survival differences in response to climate and competition treatments. We implemented a pilot study of this experimental design in 2011 using only lead-backed and striped morphotypes of *P. cinereus*. The results suggest that this design will be powerful in detecting differences among treatments when implemented on two distinct species, *P. shenandoah* and *P. cinereus*. Understanding the nature of these interactions will provide tools for making biologically based decisions to help preserve *P. shenandoah* populations under the threat of a changing climate.

Title: Patterns of Amphibian Occurrence in Alpine Wetlands in Québec, Newfoundland, and New England

Authors: Michael T. Jones*, Massachusetts Cooperative Fish and Wildlife Research Unit, University of Massachusetts, Amherst, MA 01003; mtjones@bio.umass.edu; Lisabeth L. Willey, Department of Environmental Conservation, University of Massachusetts, Amherst, MA 01003; lwilley@cns.umass.edu; Scott D. Smyers, Oxbow Associates, 629 Massachusetts Ave., Boxborough, MA 01719

Abstract: Arctic-alpine habitats are relatively rare in eastern North America, where they reach their southernmost extent in New York and New England. Alpine habitats are more widespread and diverse in Newfoundland, Labrador and Québec, where common alpine wetlands include bogs, fens, and rocky pools. Alpine areas are subjected to extreme environmental conditions including summer frosts, short growing seasons, late ice-out, strong winds, frequent fog, and elevated UV. Little is known about the amphibian communities of eastern alpine wetlands, but they are likely to respond quickly in response to environmental change and are thus reasonable long-term bio-indicators. We evaluated patterns of amphibian occurrence in alpine environments at two scales. At a broad scale, we surveyed 90 pools in 12 ranges in Québec, Newfoundland, and New England. At a finer scale, we employed visual surveys and acoustic recorders to establish long-term monitoring sites on the Presidential and Franconia Ranges, New Hampshire. Nine species were detected; these exhibited different patterns of occurrence. We found *Anaxyrus americanus*, *Lithobates sylvatica*, and *Pseudacris crucifer* broadly distributed in most alpine
areas surveyed in Québec and New England. \textit{Lithobates clamitans}, \textit{Ambystoma maculatum}, \textit{Eurycea bistlineata}, \textit{Plethodon cinereus} and \textit{Notophthalmus viridescens} were sporadically encountered in mainland alpine environments. Some northern species such as \textit{Lithobates pipiens}, \textit{L. septentrionalis}, and \textit{Ambystoma laterale} were not detected in mainland alpine areas, although introduced \textit{L. septentrionalis} were locally abundant in alpine areas in Newfoundland, co-occurring with \textit{A. americanus}. At a finer scale, anurans in New England alpine areas do not appear to show signs of cold-adaptation.

### Taking Action

**Title:** Head-starting, Habitat Improvement and Habitat Surveying: New Challenges and Development Strategies in Conservation Management of Amphibian and Reptile Populations

**Author:** Jay Westerveld, Forensic Ecology, New York Natural History Council, PO Box 114, Sugar Loaf, NY 10981-0114; biocouncil@yahoo.com

**Abstract:** In the face of new and growing challenges in herpetofaunal conservation, a suite of new solution methodologies logically follows. As new information mounts, historical paradigms of mixed success such as head-starting, habitat sustainability and improvement and population surveying obviate revision. Promising new developments from a growing body of field experience are compared to and contrasted against past models, examining past “hits and misses” in an effort to coalesce a more effective and streamlined approach to conservation and field research measures. Development concepts such as Isonatural Head-starting, Artificial/fortified hibernacula, Immersion Eco-study, Prey-based staging, Remote real-time habitat monitoring/analysis, Aerial Reconnaissance/New Ephemeral-pool surveying, Pool-infection avoidance measures, Reintroduction/Introduction/Translocation, “Virtual trespassing” via satellite freeware, Herbivoury Exclosures, etc., are introduced and discussed. Examples of field successes and failures of each concept are detailed.

**Title:** Applying Best Management Practices for Vernal Pool Protection Along Utility Corridors in the Northeast.

**Author:** Dale F. Knapp, Stantec Consulting Inc., 30 Park Drive, Topsham, Me 04086; dale.knapp@stantec.com

**Abstract:** The number of transmission lines and pipelines being constructed or proposed for construction in the Northeast has increased significantly. New utility corridors, even when co-located, can substantially change the landscape. These developments are often sited in relatively undeveloped habitat blocks (i.e., a significant distance from the load center), resulting in fragmentation and direct impact to habitat for reptiles and amphibians. They may also be in a developed area but still impacting a locally significant vernal pool population. How can Best Management Practices (BMPs) be applied during construction and line maintenance to minimize...
the impacts these corridors have on vernal pool habitat? Many states seek to protect vernal pools with BMPs or Minimum Standards for Vernal Pools encountered and crossed by a utility corridor. This presentation will cover examples of BMPs commonly used to mitigate impacts to amphibian habitat, and how those BMPs can be creatively applied in specific situations. The material will be presented based on actual project experience with the development and construction of utility corridors in the Northeast. There also will be a brief overview of alternative techniques that may be employed in this and other regions to reduce the impacts of a transmission line or pipeline project on vernal pool habitat.

### Life on the Edge – Regional Snakes of Concern

**Title:** Population Estimate of the Northern Pine Snake In New Jersey

**Authors:**
Dane C. Ward¹, Ronald M. Smith, Harold W. Avery, James R. Spotila, and Walter F. Bien; Laboratory of Pinelands Research, Department of Biology, Drexel University, Philadelphia, Pennsylvania 19104; ¹email: dcw33@drexel.edu

**Abstract:**
Understanding population dynamics is paramount for successful management and long-term conservation of rare species. The northern pine snake, *Pituophis melanoleucus*, is a state-threatened species that is declining in New Jersey. Unfortunately, quantitative population data is lacking and the northern pine snake remains vulnerable as a result of potential delisting, habitat loss, habitat fragmentation, and isolation. We developed a population “density model” for estimating the number of pine snakes at the Warren Grove Gunnery Range (WGR). The model estimates the number of snakes per-unit-area (density) within preferred northern pine snake habitat (pine-oak forest). Utilizing local and habitat specific population densities we estimated an average of 229 adult snakes occur in the local population on WGR. These data were extrapolated to estimate the historic, current, and rate of decline of the northern pine snake population in New Jersey. We estimated that the northern pine snake has experienced declines from as much as 26,087 snakes in 1985 to 24,048 snakes in 2007, a decline of 98 adult northern pine snakes per year. Understanding population size and trends is imperative for improved conservation management of this threatened species.

**Title:** Habitat Selection of Northern Black Racers (*Coluber constrictor constrictor*) in New Hampshire: Implications for Management

**Authors:** Brendan Clifford*, New Hampshire Fish and Game Department, Nongame and Endangered Species Program, 11 Hazen Drive, Concord, NH 03301; Brendan.Clifford@wildlife.nh.gov; Michael Marchand, New Hampshire Fish and Game Department, Nongame and Endangered Species Program, 11 Hazen Drive, Concord, NH 03301; Michael.Marchand@wildlife.nh.gov; Celine Goulet; independent researcher; 28 Belknap Rd
Abstract: Habitat preferences have been studied for racers, *Coluber constrictor*, but less so for populations of northern black racers (*C. c. constrictor*). Racers reach the northern extent of their range in central New Hampshire and southern Maine, with much of their NH range subjected to increasing development pressures. During 2008, black racers were listed as state threatened in NH but minimal information was available to take conservation actions. To better understand potential impacts to racers in NH and to develop appropriate conservation measures, we conducted a multi-scale (landscape, home range, activity level) evaluation of the species’ habitat use and preference. Population data was gathered through mark-recapture at 8 sites in southern New Hampshire and 27 adults (16 males, 11 females) were tracked at those sites using radio-telemetry. An additional 4 individual racers were radio-tracked following relocation from a 9th site that was under development. Ninety-seven racers were individually marked (2-23 snakes/site). Average home range (100% minimum convex polygon) of radio-tracked snakes was 100 ha (range 17-381 ha). Hibernacula were identified for 25 individuals (mammal burrows = 12, human-altered features = 9; natural rock features = 4). Fifteen hibernacula areas were communal (> 1 snake). Home range, habitat selection, and survival among resident and translocated snakes will be discussed. Habitat selection at the landscape, home range and activity-site will be presented with recommendations for developing management plans and conservation initiatives. Results are expected to inform management for other snakes of conservation concern, as well as early-successional habitat management efforts being proposed in the region.

Title: The Vermont Rattlesnake Conservation Coalition: A Science-based Conservation Partnership


Abstract: The timber rattlesnake (*Crotalus horridus*) has declined in New England and is now extinct in Maine and Rhode Island and endangered of extinction in New Hampshire, Vermont, Massachusetts, and Connecticut. In Vermont, only two rattlesnake populations remain. We formed a partnership of nonprofits, agencies, and private individuals to implement a multi-faceted science-based conservation program to recover rattlesnakes in Vermont. The Coalition is conducting field studies to monitor population status and document movements and habitat-use. In 2011, we captured and marked 104 individuals and monitored the movements of six males.
from May through October. The six telemetered rattlesnakes undertook lengthy migrations from their overwintering sites, moving a mean total distance of 11.15 km and a mean of 3.46 km from their overwintering sites. Approximately half of each rattlesnake's home range was on protected lands. We will continue this field study in 2012, during which time we will monitor additional individuals with radio telemetry. This information will be used to develop a GIS tool for prioritizing land protection. We are also working with local communities to inspire an appreciation for these rare snakes. We hold annual town-hall style meetings where we update local communities and work to develop partnerships with local land-owners. We also provide a rattlesnake removal program for local communities. Future efforts will include developing a long-term monitoring program, protecting and managing important habitats, and expanding outreach efforts. This coalition is an excellent model for how broad partnerships with community involvement can conserve rare species.

Title: Time Lapse Camera Study of Timber Rattlesnake Emergence at an Undisturbed Den in the Northeast

Authors: Michell, Tom, Timber Rattlesnake Consultant, 42 School Street, Narrowsburg, NY 12764, tomorama@gmail.com; Michell, Kathy*, Wildlife Biologist, 42 School Street, Narrowsburg, NY 12764, kmichell@hvc.rr.com

Abstract: Timber rattlesnake populations have been studied extensively by various survey methods; often involving field visits into denning and gestating areas, handling and processing of individuals as well as invasive procedures such as radio telemetry. These studies have provided a wealth of information regarding the species and its habitat. However, the human presence has been shown in some cases to alter the behavior of rattlesnakes during various stages of their annual cycle. In 2011, the authors had a unique opportunity to study a previously unknown timber rattlesnake den in the northeast with an entirely non-invasive procedure. After locating the den in 2010, all contact with the location was avoided until the spring of 2011 when a time lapse camera was placed at the den entrance. The camera was deployed for 6 weeks to capture the entire egress. Camera cards and batteries were changed weekly since the camera was set for one frame per minute, 24 hours per day. Time and temperature were recorded by the camera. No snakes were observed during those brief visits, nor were any surveys of the area conducted. The photos, approximately 10,000 per week, were transferred to a video program and professionally edited to create a fascinating glimpse into a totally natural emergence. The authors recognize that this technique has extreme limitations for its use due to the human presence at many known dens jeopardizing the equipment and leading to avoidance patterns, as well as the presence of multiple entrances at some dens formations.
Title: First Survey For The Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) In Connecticut Finds Widespread Prevalence

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Abstract: The amphibian chytrid fungus *Batrachochytrium dendrobatidis* is an emerging infectious fungal pathogen of amphibians linked to global population declines. Until now there has only been one survey for the fungus in New England, which focused primarily on northern New England. We tested for *B. dendrobatidis* in a large number of samples (>1100 individuals from >120 wetlands) collected throughout the state of Connecticut, representing 18 native amphibian species. *Batrachochytrium dendrobatidis* presence was assessed using a sensitive quantitative PCR assay. Our contemporary survey found *B. dendrobatidis* to be widespread in the state (overall prevalence was 28%) and occurring in 14 species. Importantly, no individuals displayed signs of chytridiomycosis. None of the tadpoles collected in 2007 were found *B. dendrobatidis*-positive. Two common species, bullfrogs (*R. catesbeiana*) and green frogs (*R. clamitans*) had particularly high infection rates (30% and 37%, respectively), suggesting that they may serve as sentinels for *B. dendrobatidis* occurrence in this region. In addition, data collected from the contemporary survey were analyzed with general linear models to determine, for example, how the host’s species, its sex, life stage and species richness at a wetland influenced the probability of detecting an infected host or wetland. By studying *B. dendrobatidis* in populations not facing mass declines, the results from this study are an important contribution to our understanding of how some amphibian species and populations remain stable even when *B. dendrobatidis* is widely distributed.

Title: Will removing introduced red-eared sliders alter basking behavior of native pond turtles in developed waterways?

Authors: Max Lambert*, Yale University, School of Forestry and Environmental Studies, 370 Prospect St., New Haven, CT 06511; max.lambert@yale.edu
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Robyn Screen, University of California, Davis, One Shields Ave, Davis, CA 95616; rmscreen@ucdavis.edu
Abstract: Red-eared sliders (Trachemys scripta elegans) are a widely introduced species but their impact on native turtle populations has yet to be evaluated in detail. The western pond turtle (Emys marmorata) is California’s only native freshwater turtle species and, although they are declining throughout their range, maintain seemingly healthy populations in developed waterways. However, sliders also often boast large populations in developed waterways due to releases from the pet trade. From 2009-2010 we measured a suite of characteristics of 24 basking sites in a developed waterway in California and surveyed differences in pond turtle and slider presence at each basking site. We found that several traits, including high human activity and shallow slopes, were associated with higher relative abundance of introduced sliders. This study indicates that the two species are using habitat differently in this highly modified waterway but cannot distinguish between competitive exclusion and species-specific habitat preference as the cause of these differences. In the summer of 2011 we removed most of the red-eared sliders from the waterway and are now assessing if pond turtles alter basking behavior in response to the slider removal. By treating slider removal as a large-scale experimental treatment, we hope to determine the response of pond turtles in the next few years. Determining the effect of a slider removal may have important implications for managing turtle habitat in urban and suburban ecosystems.

Title: Three Edge-of-Range Species in Vermont that have Not Been Located in Recent Years

Abstract: Vermont has 12 herptile species that are considered high priority species of greatest conservation need. Of these, all but the Wood Turtle (Glyptemys insculpta) are edge-of-range species. Three of these species have not been located in Vermont in recent years. The North American Racer (Coluber constrictor) was last documented in 2008 in the southern Connecticut River Valley. The Boreal Chorus Frog (Pseudacris maculata) was last located in 1999 along the Canadian border in Alburgh and Fowler’s Toad (Anaxyrus fowleri) was last located in the Connecticut River Valley near the Massachusetts border in 2007. The causes of these declines are unknown; however, habitat loss, fragmentation, and succession all appear to be contributing factors. Large population shifts have been documented for Fowler’s Toad in Canada. It is hoped that this is also the case for this species along the Connecticut River and that it will return to the
recently scoured river valleys in future years. However, habitat fragmentation may make recolonization more difficult than in past decades.

**New Discoveries - Cracking the mystery with genetics**

**Title:** A new species of leopard frog (Anura: Ranidae) from the urban northeastern US

**Authors:** Jeremy Feinberg\(^1,2\), Joanna Burger\(^1\), Cathy Newman\(^3\), Brad Shaffer\(^3\) and Leslie Rissler\(^4\), \(^1\)Rutgers, Graduate Program in Ecology and Evolution, \(^2\)Brookhaven National Laboratory, \(^3\)University of California Davis/Los Angeles, \(^4\)University of Alabama

**Abstract:** Only two leopard frog species have traditionally been recognized to occur in the northeastern U.S. The southern leopard frog (*Rana sphenocephala*), has traditionally been reported as the only leopard frog to occur in New Jersey (throughout the entirety of the state), as well as Long Island, Staten Island, and the five southeastern-most counties in mainland New York State. The northern leopard frog (*Rana pipiens*) has traditionally been reported to occur to the north, west, and east of the southern leopard frog’s terminus in New York.

We will provide a brief ecological overview of our recently published paper from Molecular Phylogenetics and Evolution and discuss plans for our second paper to formally name the species. We will review basic ecology, behavior, and breeding phenology of the yet-to-be named leopard frog, *Rana sp. nov*. We will also review basic history, geographic range of samples tested, putative expectations of the entire species range, and outstanding questions.

**Title:** Hopping into New Territory: A Case of Amphibian Range Expansion in New Jersey

**Authors:** Paola Dolcemascolo*, Department of Earth and Environmental Studies, Montclair State University, 1 Normal Ave, Montclair, NJ, 07043; dolcemascop1@mail.montclair.edu
Karena DiLeo, NJ Division of Fish and Wildlife, Endangered and Nongame Species Program. 501 East State St. Trenton, NJ 08625; karena.dileo@conservewildlifenj.org

**Abstract:** Green tree frogs, *Hyla cinerea*, are ubiquitous across their geographic range, from Delaware south along the Atlantic Coastal Plain to Florida, westward along the Gulf Coastal Plain to eastern Texas, and north into the Mississippi River Valley to southern Illinois. In June 2011, a large population of *H. cinerea* was discovered in southwestern New Jersey along the Delaware River. This was the first recorded occurrence of *H. cinerea* in NJ and represents a possible range expansion past their northern-most limit in Delaware. Subsequent reports of this species have been confirmed along the Delaware Bayshore and a more comprehensive survey will be completed in 2012. Northeastward range expansions have been documented in Illinois and recently metamorphosed *H. cinerea* have been found 0.5 km from the nearest breeding habitat, demonstrating dispersal capacity. To determine whether the NJ population was established via colonization by Delaware tree frogs, genetic analyses were undertaken. Toe clips
were collected from both populations and partial sequences of the mitochondrial ND1 gene were used to generate a statistical parsimony network. Results indicate that the NJ individuals are closely related to the Delaware population, with some sequences being identical. This relationship is most likely a result of a recent movement of Delaware frogs into NJ. Although movement may have been human-mediated, rising temperatures throughout the eastern and central US are possibly favoring the persistence and establishment of these frogs in new areas.
**POSTER ABSTRACTS**  
(alphabetical by first author last name)

**Title:** An Investigation of the Population Structure of *Apalone spinifera* in Lake Champlain  

**Authors:** Lucas Bernacki*, Department of Biology, University of Vermont, 109 Carrigan Drive, Burlington, VT 05401; lbernack@uvm.edu; C. William Kilpatrick, Department of Biology, University of Vermont, 109 Carrigan Drive, Burlington, VT 05401; wkilpatr@uvm.edu  

**Abstract:** The Spiny Softshell Turtle (*Apalone spinifera*) is listed as a threatened species in the state of Vermont. Efforts by wildlife biologists to study this species have been met with extreme difficulty, especially in the execution of a mark-recapture study (6 captures in 11,000 trap hours). Population structure was investigated by means of a genetic assessment of the Spiny Softshells of Lake Champlain. Tissue was collected from hatchlings and eggs shells on nesting beaches. Estimates of effective population size, number of populations, and haplotype diversity were complicated by the presence of heteroplasm in the VNTR1 of the mtD-loop. Customized primers, designed to circumvent the loss of sequence resolution due to heteroplasmic regions, proved to be effective in short-fragment sequencing of the complete mtD-loop. In preliminary analyses, partial sequence comparison showed haplotype collections distinct to each of the purported populations. The northern population showed haplotypes with 5-7 50bp repeats in VNTR1 whereas the southern population showed haplotypes with 3-4 50bp repeats. More recent results identified a heteroplasmic individual from the southern region with both 6 and 7 50bp repeats in VNTR1. This result suggests that there may not be any sub-structuring in the Lake Champlain population of *Apalone spinifera*. Furthermore, it appears that a haplotype unique to each individual may be the rule rather than the exception. Analysis of the complete D-loop sequence is underway and is expected to add resolution to this study, which in turn will be useful for making informed management decisions concerning this threatened species.

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**Title:** Are Redbacked Salamanders Sensitive to Soil Calcium? Contrasting Evidence from Across the Northern Forest Region.  

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**Abstract:** Many amphibians are sensitive to changes in pH and their distribution may be limited by acidification and loss of calcium (Ca) from upper soil horizons. Low soil pH has been shown to limit suitable microhabitats of eastern redbacked salamanders (*Plethodon cinereus*) - a keystone species in northern hardwood forests that strongly shapes leaf litter food webs and metabolism of key nutrients. Recent research in upland hardwood forests of the Adirondack...
Mountains, NY found a strong positive relationship between redbacked abundance and soil Ca. Diet analysis of those salamanders found that they consumed more Ca-rich invertebrate prey than other salamander species at the same sites. To evaluate whether these relationships existed across the broader Northern Forest region, in 2011 we replicated the Adirondack study at upland forest sites across Vermont and New Hampshire. Salamanders, their stomach contents, and forest floor invertebrates were sampled at sites representing a gradient in Ca availability. We found that redbacked salamanders were the most abundant salamanders but their abundance was unrelated to soil Ca, unlike in the Adirondacks. Interspecies competition with northern dusky salamanders at the Adirondack sites, but absent from our sites in Vermont and New Hampshire, may explain differences in results. Diet samples of 157 redbacked salamanders along this Ca gradient are being analyzed to determine if any differences in prey exist based on soil chemistry. In light of recent studies indicating redbacked salamanders may be able to acclimate to low-pH forest soils, we will conduct more in-depth sampling at these sites in 2012.

Title: Herpetofaunal diversity of the Helderbergs in Albany County, NY

Authors: Alvin R. Breisch*, Partners in Amphibian and Reptile Conservation, 29 Fiddlehead Lane, Altamont, NY 12009, arbreisch@yahoo.com; Mark Fitzsimmons, Albany County Office of Natural Resources, 112 State Street, Room 720, Albany, NY 12207, Mark.Fitzsimmons@albanycounty.com

Abstract:
The Helderbergs of Albany County, NY, are a small, calcareous mountain range occupying an area of approximately 300 square kilometers (116 square miles). At the base of the higher elevations are steep, forested talus slopes which transition into diverse lowland habitats cut by streams that drain into extensive and diverse complexes of wetlands. We began herpetofaunal surveys within the Helderberg area in 1979, and over the past 33 years have recorded 21 amphibian and 12 reptile species. Five of these are listed by New York State as Species of Special Concern and 10 as Species of Greatest Conservation Need. The total species for the Helderbergs represent 81 percent of the amphibians and 55 percent of the reptiles known from Hudson Valley Ecozone. Five additional species for which historic records exist in the Helderbergs are considered to be extirpated, although suitable habitat for all of these species still exists. Partners in Amphibian and Reptile Conservation recently proposed establishing Priority Amphibian and Reptile Conservation Areas (PARCAs), similar in concept to Audubon’s Important Bird Areas Program. Criteria for identifying these areas include viability of the landscape in which they occur; presence of one or more species of state, national, or global significance; or areas with exceptionally high herpetofaunal diversity. Using these criteria, the Helderberg area ranks as one of the most significant herpetofaunal areas in New York State and should, therefore, be considered for PARCA status under established criteria for herpetofaunal significance.
**Title:** Why Did Terrapins Cross The Runway? The puzzling turtle invasion of JFK airport

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**Abstract:** Each summer 2009-2011 domestic and international news agencies carried stories about diamondback terrapins (*Malaclemys terrapin*) causing delays on runways at John F. Kennedy International Airport, one of the busiest airports in the world. JFK Airport is located within New York City on the eastern edge of Jamaica Bay, and has a number of associated wildlife issues. Airport construction was started in 1942, eventually covering 2000 ha of smooth cord grass salt marsh with solid fill and destroying considerable amounts of terrapin marsh habitat. Nevertheless, incidental evidence indicates that a large terrapin population persists, likely in excess of 10,000 individuals. Most Jamaica Bay salt marshes are eroding for a variety of reasons, but the marsh near the airport appears to disintegrating most slowly, perhaps because it is the youngest and the highest.

Terrapins have been reported on JFK runways annually since 2001, and a small number were killed each year until the recent surge in terrapin numbers. This increase is due to a surge in recruitment, movement of individuals from other parts of the bay, a change in nesting behavior, and/or increased detection by airport personnel. Elsewhere in Jamaica Bay, terrapins have undergone dramatic changes in reproductive patterns over the last decade, including reduced clutch frequency, increased egg size, and increased clutch size. These changes are unexplained but may be due to the deteriorating marshes.

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**Title:** Enhancing the Scientific, Education, and Conservation Impact of FrogWatch USA

**Authors:** Rachel Gauza* and Shelly Grow, Association of Zoos and Aquariums, 8403 Colesville Road, Suite 710, Silver Spring, MD 20910; rgauza@aza.org

**Abstract:** FrogWatch USA engages people in data collection on anuran populations and supporting wetland habitats nationwide. Established in 1998 as a primarily contributory project, volunteers collected and submitted data following a standardized protocol. The Association of Zoos and Aquariums (AZA) assumed management in 2009, providing an opportunity for program review and evaluation. A strategic plan was developed to identify organizational, scientific, and educational goals, among them being:

1. Growth in participation through chapters hosted by accredited zoos and aquariums;
2. Improved data quality and increased utility by the professional community; and
3. Expanded engagement and collaborative opportunities for participants.

To address these three, and other, programmatic goals, AZA partnered with the National Geographic Society under a National Science Foundation Informal Science Education grant in 2010. Program enhancements are ongoing and include: increased volunteer recruitment, training, retention, and satisfaction; intensive data review and implementation of proactive data screening measures; and development of an interactive online data entry, mapping, and visualization tool. AZA envisions FrogWatch USA as a collaborative project that facilitates science learning, generates useful data, and inspires conservation engagement among a community of public and professional participants.

Title: Habitat Use by Pool-breeding Amphibians in Maine’s Montane Region

Authors: Luke Groff*; Department of Wildlife Ecology, University of Maine; Maine’s Sustainability Solutions Initiative; 5755 Nutting Hall, Room 210, Orono, Maine 04469; lukegroff@gmail.com; Aram Calhoun; Department of Wildlife Ecology, University of Maine; 5755 Nutting Hall, Room 210, Orono, Maine 04469; calhoun@maine.edu; Cynthia Loftin; U.S. Geological Survey, Maine Cooperative Fish and Wildlife Research Unit; 5755 Nutting Hall, Room 210, Orono, Maine 04469; cynthia.loftin@maine.edu

Abstract: Maine is ecologically diverse with a varied landscape. Although pool-breeding amphibians generally are distributed across the state, the vernal pools they typically use for breeding are more limited geographically. Current legislation to protect vernal pools is based on research conducted in southern, central, and downeast Maine where vernal pools are relatively abundant; it is not clear how these species use alternative habitat for breeding where vernal pools are scarce. For example, Maine’s montane region is rugged and relatively wetland-limited, with one of the coldest climates in New England. Very little is known about pool-breeding amphibian dispersal, migration, hibernation, and selection of breeding habitat in this pool-limited region of Maine. Hibernaculum selection may be critical to individual fitness; six-months of hibernation ends with a short, explosive breeding period in nearby wetlands that are not necessarily typical vernal pool habitat used elsewhere in the state. Our research examines habitats used by pool-breeding amphibians throughout the annual life cycle in Maine’s western and interior mountains. Our study (1) describes the spatial distribution of alternative breeding habitats used by pool-breeding amphibians, (2) determines micro- and macro-habitat selection for by wood frogs (Lithobates sylvaticus) during the post-breeding period, and (3) determines hibernaculum characteristics selected for by wood frogs prior to the overwintering period.

Title: Updated Summary of Vernal Pool Regulations in the Northeast

Authors: Mary Beth Kolozsvary*, Department of Environmental Studies, Siena College, 515 Loudon Road, Loudonville, NY 12211; mkolozsvary@siena.edu; Anne Duperault, The Nature
Abstract: Vernal pools are a unique class of small, isolated, shallow ephemeral wetlands that undergo cyclical periods of drying and inundation. In the Northeast, vernal pools typically occur in forested landscapes and are an important ecological resource, including habitat for many invertebrate and amphibian species. The small size and dynamic nature of vernal pools creates challenges in their conservation and not all states regulate them in their freshwater wetland policies. We provide an updated summary of current regulations governing vernal pools for the northeastern states of Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. This summary refers only to statewide freshwater wetland policies; many municipalities have enacted local laws that enhance or include protections of vernal pools. In some states, vernal pools can qualify for protection if they are critical breeding habitat for a state’s endangered or threatened species.

Title: Habitat Characteristics and Amphibian Reproduction in Adirondack Vernal Pools: Is Wet Enough?

Authors: Katherine McKissick and Stacy McNulty*
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Abstract: *Lithobates sylvaticus* and *Ambystoma maculatum* are two amphibians widely known for their utilization of ephemeral, or vernal, pools as breeding sites. Because larvae develop within the vernal pools and breeding adults reside in the upland habitat, it is likely that both in-pool and upland habitat characteristics influence amphibian reproductive success. Habitat characteristics and amphibian reproduction and survival were assessed for 23 vernal pools sampled from May through July 2010 in SUNY ESF’s Huntington Wildlife Forest. Number of *A. maculatum* and *L. sylvaticus* egg masses deposited in each pool were significantly correlated ($R^2 = 0.35$) and tended to be large-perimeter, deeper pools. Additionally, 60% of the vernal pools with no *L. sylvaticus* egg masses also contained no *A. maculatum* egg masses. Some 88% of inactive pools were within 55 m of active pools, which suggests that amphibians had the opportunity to breed in either pool and may have avoided some pools. *L. sylvaticus* metamorph survival rate differed 30-fold among 5 pools assessed using drift fences and pitfall traps. Despite this variation among pools, survival rate of juvenile wood frogs was not correlated with any of the in-pool or upland characteristics. Spotted salamander larvae grew faster in warmer pools. Large, deep, ephemeral wetlands seem to be important to both *L. sylvaticus* and *A. maculatum*. In this forested, undisturbed site, in-pool habitat characteristics likely played a role in amphibian selection of vernal pools for breeding, but upland characteristics did not factor as strongly.
Title: Monitoring Eastern Spadefoot (*Scaphiopus holbrookii*) Activity Using a Passive Integrated Transponder (PIT) System: Effects of Meteorological Variables on Burrow Emergence

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Abstract: Eastern spadefoots (*Scaphiopus holbrookii*) are one of the rarest and least-understood amphibian species in the northeastern United States. Populations are localized in New England and it is likely that some populations go undocumented due to the species’ cryptic habits. The objectives of this study were: (1) to quantify how often individual spadefoots emerge from their burrows, (2) to assess the effects of selected meteorological variables on *S. holbrookii* burrow emergence, and (3) to interpret results from this study in the context of *S. holbrookii* life history to better inform/refine potential nocturnal encounter survey protocols for this species. We used passive integrated transponders (PIT tags) to monitor burrow emergence with the aid of continuously-running, stationary (but portable) PIT tag readers dubbed “toad totes”. We monitored the activity of individual toads by placing circular antennae directly over burrows of PIT tag-implanted individuals. In the spring, summer, and fall of 2009-2011, eighteen toads were monitored from 1 to 84 nights. Our results indicate that, on average, toads emerged on 43% of nights they were monitored. Mixed effects logistic regression modeling revealed that spadefoot emergence nights were warmer and more humid than non-emergence nights. Toads were also found to be much more likely to emerge on a given night if they had emerged the night before.

Title: Biological Connectivity of Wetlands Demonstrated by Three Anuran Species and Implications for Wetland Conservation

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Abstract: Effective conservation efforts require detailed knowledge of a species’ use of and movements between different habitats within a landscape. We sought to understand how anurans used and moved among a variety of aquatic features, including both ephemeral and permanent navigable water bodies, within two different landscapes. We used radio telemetry to track the movements of three anuran species: wood frogs (*Lithobates sylvaticus*), southern leopard frogs (*L. sphenocephalus*), and green frogs (*L. clamitans*). Sixteen *L. sylvaticus*, eleven *L. sphenocephalus*, and six *L. clamitans* were tracked between January and June 2012. We found
that individuals of each species moved among the different aquatic features within both landscapes, suggesting that the aquatic features were biologically connected by anuran movement. Of the thirty-three frogs tracked, twenty-one (11 *L. sylvaticus*, 10 *L. sphenophalus*, 4 *L. clamitans*) utilized more than one type of aquatic feature within the landscape, including both small, ephemeral wetlands and permanent, navigable water bodies. These results suggest that wetland conservation should focus on protecting a landscape with a variety of aquatic features in order to maintain biodiversity. Furthermore anuran movement can be used to establish biological connectivity among aquatic features, which in turn establishes the existence of a “significant nexus” between small, ephemeral wetlands and traditional navigable water bodies. Small, ephemeral wetlands that are shown to have a “significant nexus” with a traditional navigable water body are eligible for regulation (and conservation) under the Clean Water Act.

Title: What is Normal? Observations of a Possible Secondary Disease Process in Northeastern Timber Rattlesnake (*Crotalus horridus*)

Authors: Anne G. Stengle*, Organismic and Evolutionary Biology, 221 Morrill Science Center, University of Massachusetts, Amherst MA 01003, astengle@bio.umass.edu; Thomas F. Tyning, Environmental Science Department, Berkshire Community College, Pittsfield MA 01201, ttyning@berkshirecc.edu; Paul R. Sievert, U. S. Geological Survey, Massachusetts Cooperative, Fish and Wildlife Research Unit, Department of Environmental Conservation, University of Massachusetts, Amherst, MA 01003, psievert@eco.umass.edu

Abstract: Populations of *Crotalus horridus* have become increasingly fragmented in portions of their range during the past two centuries. Observations of widespread infections and/or facial lesions in some populations have been suggested to be the result of decreased population size, reduced genetic variation, and/or increased summer rainfall. To determine if snakes with facial lesions exhibit differences in habitat use and movement patterns, we monitored snakes with and without lesions in western Massachusetts for three years. We also recorded the prevalence in five Massachusetts populations based on direct observations and analysis of shed skins. We defined lesions as any injury or infection affecting 15% or more of the face. Lesion rates ranged from 5.6% to 26.7%. Biopsies were conducted on the lesions from 10 individual snakes. Males with (*N* = 4) and without (*N* = 7) lesions showed no difference in mean body mass, maximum home range, minimum distance moved from den, or activity range length. All snakes followed more than one year gained weight. Habitat use also did not differ. Prevalence of disease, and possible causative agents, are rarely reported for free-ranging snakes. We encourage others to report their findings in all snakes. Though we didn’t detect significant effects of lesions on the physiology or behavior, we urge caution in interpreting these results due to small sample sizes, and the tendency of snakes with lesions to move shorter distances. Conservation strategies involving the translocation of individuals between populations should be carefully reviewed in order to reduce the possibility of disease spread.
**Title:** An assessment of reptiles and amphibians in the Bronx River: urban herpetology from an historic perspective

**Authors:** Valorie R. Titus, Jonah Rothleder, Mara Kraenzlin, Wildlife Conservation Society, Bronx, NY

**Abstract:** During industrialization of the Bronx, the Bronx River was utilized as a sewer into which industrial waste was poured. In more recent times, even with the reduction of industry, the river has continued to be polluted from the communities and roadways that line its banks. There has been a public outcry to return the Bronx River to a more natural state as urban runoff pollution continues to be a serious problem for the river. Even with this significant pollution, the Bronx River has historically been the home to many reptile and amphibian species. There is an ongoing effort to restore the river, however, many species that once flourished here are either extirpated or are rarely observed. A few species, such as the snapping turtle, are still common, yet some exhibit abnormalities that may be related to anthropogenic influences. There are still multitudes of pollutants, likely present in the waterway due to urban runoff. Disease prevalence may also have an effect on the reptile and amphibian species diversity and populations. Introduced species also pose a threat. The goal of this project was to collect baseline natural history data on the reptiles and amphibians in the Bronx River to compare to historic accounts. We conducted surveys to determine the distribution of species and age and sex classes present. We also looked at the presence of disease, infectious agents, parasites and the pollutants in these populations. These data will serve as an indication of how the natural environment of the Bronx River has changed, as well as serve as one baseline for comparison with future inventories to measure the success of Bronx River restoration efforts.

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**Title:** North American Amphibian Monitoring Program (NAAMP): Results from a Participant Survey

**Authors:** Linda Weir*, USGS Patuxent Wildlife Research Center, 12100 Beech Forest Road, Laurel, Maryland 20708; lweir@usgs.gov; Steve Gillespie, USGS Director’s Office, 12201 Sunrise Valley Drive, Reston, Virginia 20192; sgillespie@usgs.gov

**Abstract:** Volunteers of the North American Amphibian Monitoring Program (NAAMP, website: www.pwrc.usgs.gov/naamp) who collected data in 2011 were invited to complete an online participant survey for prioritizing survey improvements. The response rate was 84% (503 invited; 421 responded). Participants were asked to rate their satisfaction with various aspects of NAAMP including: the NAAMP website, Frog Quiz website, datasheets, and route maps. In addition, questions were asked regarding their background and what potential resources would be useful. Satisfaction was rated on a 1-5 scale (1= very satisfied to 5=very dissatisfied). Combining very satisfied and satisfied responses, the overall satisfaction was: 87% for NAAMP website, 86% for the Frog Quiz website, and 90% for NAAMP datasheet. Satisfaction with route maps was higher for participants using the new version maps (80%) than older version maps (47%). New maps are PDFs available online, while older maps are available as printed copies.
only. The majority of NAAMP observers have participated in other wildlife surveys (74%) and slight majority have worked in natural resources field (56%). Only 37% of respondents reported knowing frog calls prior to joining NAAMP. Participants were asked whether they own a smartphone, as it is related to some of the potential new tools. Only 26% of NAAMP participants own a smartphone, which is less than the national average (35% of US adults according to May 2011 Pew Internet and American Life Project survey). Of the potential tools proposed, the most desired was additional online frog call information (86%); least desired related to smartphones.

Title: Species decline in outwardly-healthy habitat: NY’s enigmatic Northern Cricket frog. The role of the Water-lily Plant hopper (*Megamelus davisi*) and the Aquatic springtail (*Podura aquatica*) in Northern Cricket frog (*Acris crepitans*) migration and population sustenance; How collateral water-lily planthopper eradication may have secondarily-effected Cricket frog decline in New York.

Author: Jay Westerveld, Forensic ecology, New York Natural History council, 114 Kings Hwy., Sugar Loaf, NY 10981-0114 biocouncil@yahoo.com

Abstract: In New York State, the Northern Cricket frog has evidenced acute decline since the 1970s. At NY’s largest remaining Cricket frog metapopulation node, the Water-lily plant hopper occurs en masse over hundreds of acres of wetland habitat. Cricket frogs are observed to predate this delphacid with near-exclusivity throughout the warmer months. Comprehensive surveying of other NY historic/extirpated Cricket frog habitat in Harriman State Park, etc., reveals absence of Water-lily plant hoppers. Much of this historic-extirpated habitat was (aerially) treated with pesticides in the 1970s to control invasive outbreaks of gypsy moth (*Lymantria dispar*); The Glenmere metapopulation site, centered around a public water supply, was spared broadcast of this non-specific pesticide. In contrast to the Gypsy moth, the Water-lily plant hopper is both a habitat specialist and, in most cases, flightless, and thus unlikely to demonstrate rapid repopulation of treated habitat. The collateral eradication of Water-lily plant hopper populations at historic Cricket frog habitats may help to explain the present site vicariance. The possible role of collateral Water-lily plant hopper eradication in Cricket frog decline and the proactive reestablishment of Water-lily plant hopper populations at planned Cricket frog repopulation sites is discussed, as is the role of water-lily plant hopper dispersal in seasonal Cricket frog in/out migration.

Title: Demographic Studies of a New Hampshire Wood Turtle (*Glyptemys insculpta*) Population

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Abstract: The wood turtle, *Glyptemys insculpta*, is declining and is considered a species of regional conservation concern and high regional responsibility in the Northeast. We surveyed a wood turtle population along an unimpaired 1 km stream segment from 2004 to 2012 then used a Cormack-Jolly-Seber model to estimate adult capture and survival probabilities; the Horvitz-Thompson estimator was used to derive estimates of adult population size. Survival rates remained high (over 90%) throughout the study. Adult population size did not change significantly throughout the study (2005 = 29 adults, 2011 = 34 ± 15 95% CI). These demographic parameters were also evaluated in the context of home ranges and growth rates. Overall, this appears to be a stable population, which may be the result of the large proportion of the population’s home range land under protection. The population estimates of this study will be used as a baseline validation for a rapid assessment protocol developed as part of a coordinated research strategy for wood turtles in the Northeast.