

2015: Year of the Frog

© John White

VIRGINIA HERPETOLOGICAL SOCIETY

VOL. 25 NO. 1 MARCH 2015

Inside This Issue:

Spring Survey Announcement	2	Upcoming Events	9
Grant Updates	3	Save Our Scales	11
Herp Trivia	6	Zoo Updates	12
New Books	7	Virginia Literature	17
News	8	Virginia Natives	20



You're invited to the 2015

VHS Annual

Spring Survey

May 8-10, 2015

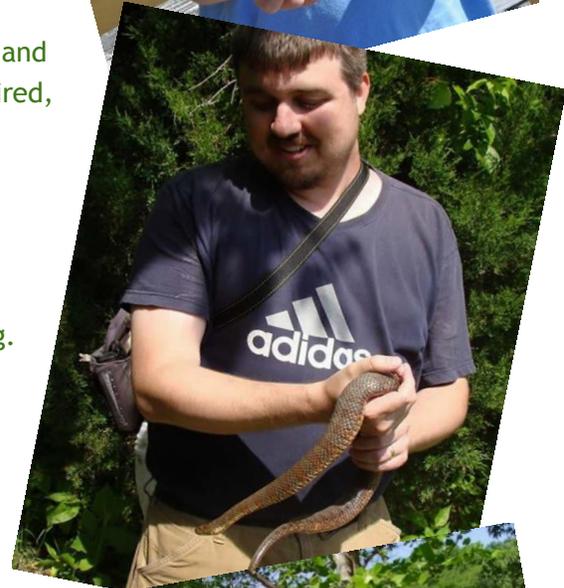
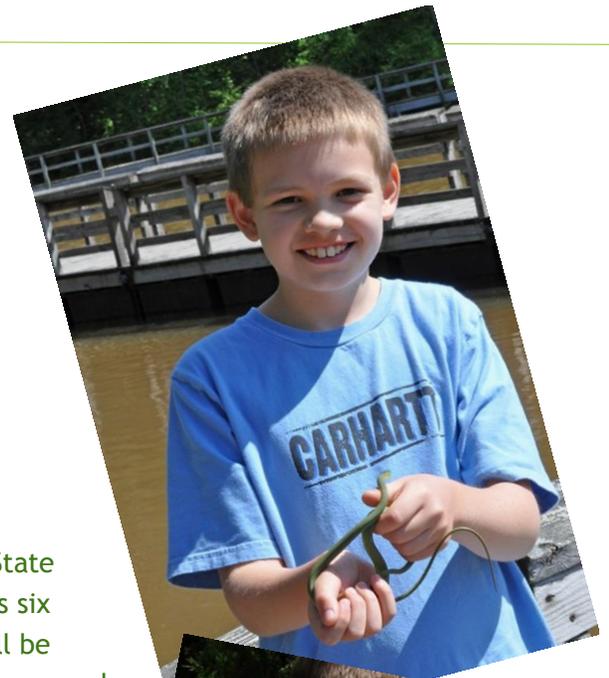
The VHS will be holding our Annual Survey at Westmoreland State Park, rain or shine. This park is over 1,300 acres and includes six miles of trails and scenic views of the Potomac River. We will be splitting into groups to catch or observe the park's herpetofauna, and the results will be published in our journal. No experience is required, nor is handling of any animals required. There are many forms of recreation available for family members not participating in the survey, including fishing, boating and swimming. Also, several attractions are nearby, including George Washington's birthplace. Attendees are encouraged to visit the VHS Facebook page for this event to ask questions, and coordinate carpooling/ lodging sharing. For more information, please check our website: www.virginiaherpetologicalsociety.com/blog.

Westmoreland State Park

145 Cliff Road, Montross, VA 22520

Registration: <http://tinyurl.com/VHSSurvey2015>

Registering for this Survey will help us plan for any large numbers and to ensure we can accommodate everyone.



Grant Updates

Updates on Research and Conservation Projects Recently Receiving Funding from VHS

Developing an Occupancy and Detection Model for Wood Turtles (*G. insculpta*) across the Northern Virginia Landscape Using eDNA

Lorien Lemmon¹, Thomas Akre², William McShea², Jeffrey Dragon¹, J.D. Kleopfer³

¹George Mason University ²Smithsonian Conservation Biology Institute

³Virginia Department of Game and Inland Fisheries

OVERVIEW OF WOOD TURTLE STREAM SURVEYS:

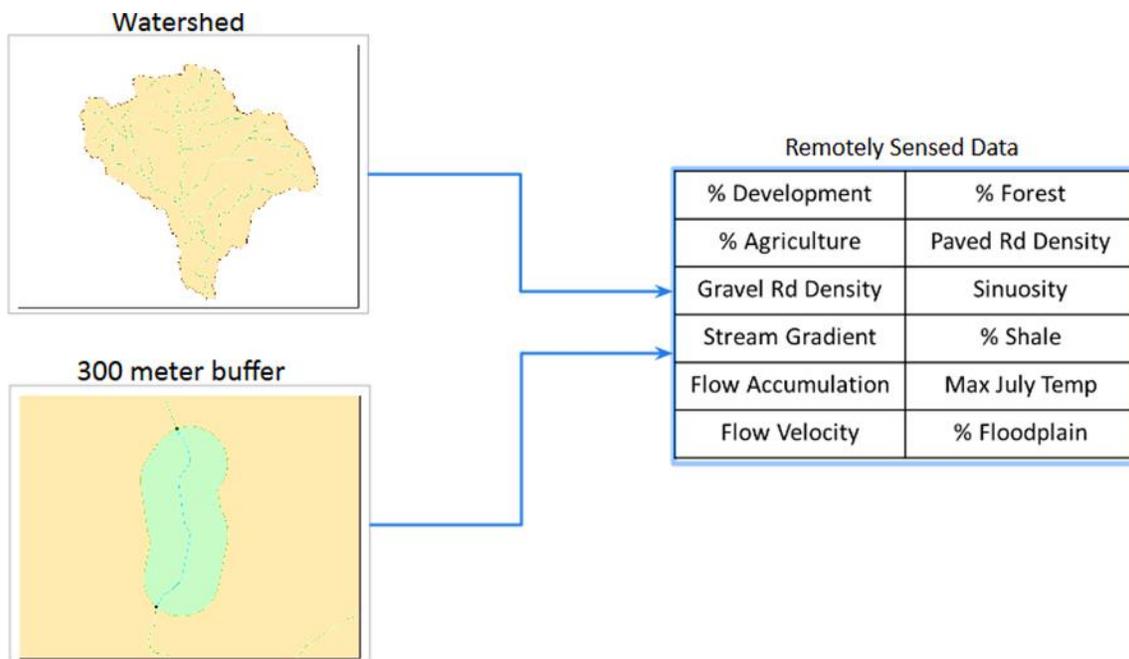
Performed 47 surveys on 16 different streams in Spring of 2014

Observed 117 wood turtles during Spring of 2014

Observed a total of 568 wood turtles since Spring of 2012 at 56 different streams across Northern Virginia



Variables Collected:



Variables collected (continued):

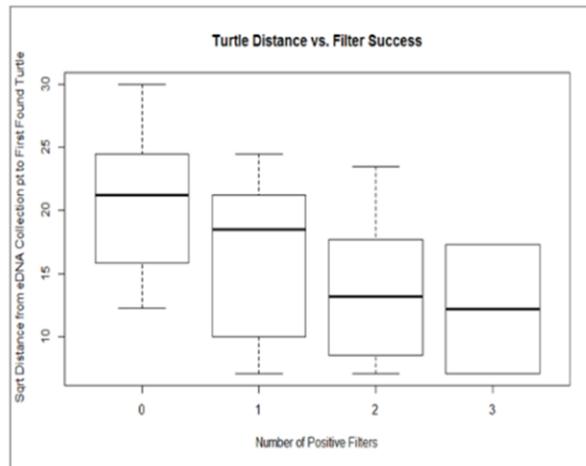
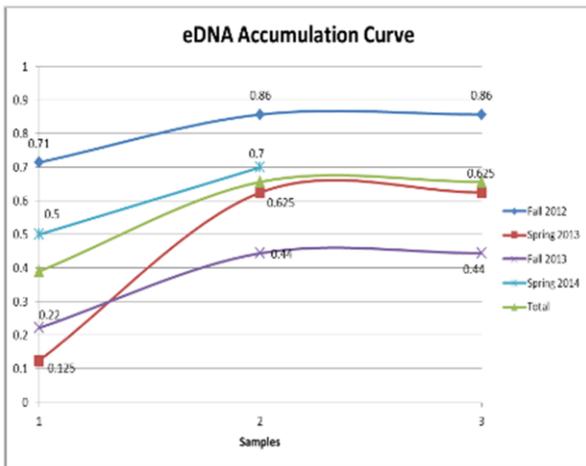
Stream Microhabitat



Collected on the ground

Canopy Cover	Land Use	In-Stream Habitat
Woody Debris	Width	Riparian Buffer Width
Embeddedness	Depth	Stream Bed Substrate

eDNA Success:



Engaging Citizen Scientists to Determine Prevalence of Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) and Ranavirus

LONG BRANCH NATURE CENTER IN ARLINGTON, VA

Matt Neff and Lauren Augustine

Smithsonian National Zoological Park

3001 Connecticut Ave. NW Washington DC. 20008

PROPOSED TIMELINE:

March 2014-May 2015- Swab amphibians and box turtles in Long Branch for emerging diseases

May 2015- submit samples for analysis

July 2015- Begin working on publication of results

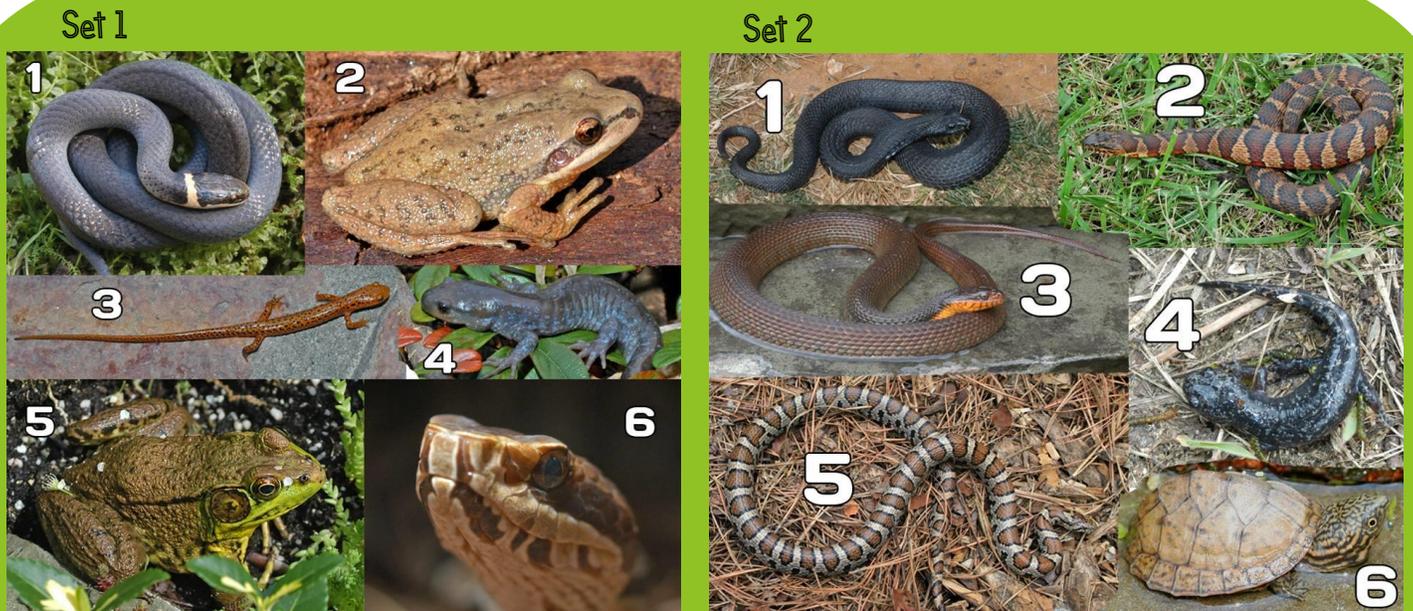


To date, we have received swabs from San Diego Zoo's Amphibian Disease Lab and hosted two groups at Long Branch Nature Center. A total of ten amphibians and one eastern box turtle have been swabbed for chytrid fungus and Ranavirus, for a total of 11 swabs in 2014. Ten people have accompanied us in the field and learned about emerging reptile and amphibian disease and the protocols for swabbing. We head back out in the field this March to begin spring sampling and will announce the opportunity to National Capital Chapter of the American Association of Zoo Keepers (AAZK) members to join us. Furthermore, we intend to invite park staff, Greater Baltimore AAZK, and some National Zoo volunteers to join us.

We look forward to the spring and are currently on schedule to submit samples by May 2015. We continue to solicit funding in order to maximize our sampling effort and increase the scope of this project in terms of educational outreach.

Herp Trivia

CAN YOU IDENTIFY THEM ALL?



1. Which state endangered turtle species (only known in two locations in Virginia) was featured in a presentation at the VHS Annual Fall Meeting?
2. If you have a large enough property with areas of yard or woods away from your house, you can create hibernation habitat (or habitat for a hibernaculum) for what reptile on your own property, by piling (not stacking) sticks, branches, leaves and the like in an area with permeable soil and leaf litter?
3. What new publication, related to Virginia herpetofauna, was recently released by the Virginia Department of Game & Inland Fisheries (VDGIF), and some of the first printed copies were handed out to VHS Fall Meeting attendees?
4. What new species of frog has recently been described and has been found in Virginia?
5. True or False: VHS membership dues do not go directly toward supporting research and conservation efforts in Virginia.
6. What emerging disease, believed to be impacting wild snake populations, was recently confirmed in Virginia via a study conducted by staff at the Virginia Zoo, with funding and support provided by VHS?
7. What group of herps is being featured in a 2015 initiative supported by VDGIF and other partner organizations?
8. The discovery by an international team of researchers, including University of Alberta professor Michael Caldwell, found fossilized remains of four ancient snakes that were how many millions of years old?

Solutions are on Page 10

New Books

IN SEARCH OF LOST FROGS: THE QUEST TO FIND A BEAUTIFULLY RICH AND PERSONAL EXPLORATION OF THE PLIGHT OF AMPHIBIANS AND THE PEOPLE WORKING TO SAVE THEM

Author: Robin Moore

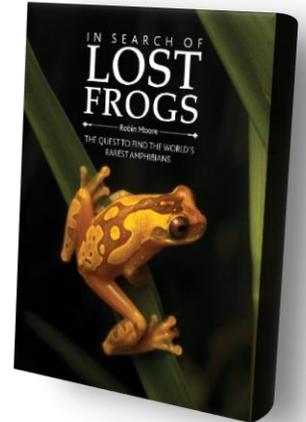
Publisher: Firefly Books

Publication date: September 2014

Price: 50% off list price, \$17.50, plus \$7.00 S&H in U.S. (through [HerpDigest](#)); or \$25.82 (through [Amazon.com](#))

Description: Moore's book proves him not just a fantastic photographer but an excellent reporter and compelling storyteller. Such a vital part of the natural world, amphibians are lucky to have this artist on their side. A magnificent record of the global hunt for "lost" frog species.

In Search of Lost Frogs is a stunning record of Moore's journey and what he and his team did (or did not) find. The book is overflowing with exquisite close-up photographs by Moore that display the frogs' remarkable coloring and camouflage, and reveal their diminutive size -- many of the frogs are less than 5 cm long, if that. Moore's engaging text tells the story of the expedition, its highs and lows, discoveries and failures, and the campaign's ongoing work. Hardcover, 256 pages, over 400 full-color photographs, maps, index.



A GUIDE TO THE TURTLES OF VIRGINIA

Authors: John D. Kleopfer, Thomas S. B. Akre, Susan H. Watson, and Ruth Boettcher

Publisher: Virginia Department of Game & Inland Fisheries

Publication date: 2014

Price: \$7.95

Description: Authored by biologists at the Department of Game and Inland Fisheries and the Smithsonian Institution - this is a one-of-a-kind publication written by the experts! Virginia and its surrounding waters is habitat to 24 species of turtle, including 5 species of sea turtles. With over 100 photographs and illustrations, this guide is intended to help you identify the turtles of Virginia, while providing insight into their behavior, ecology, distribution, and conservation. Most of all, we hope this guide will raise your awareness and motivate you to become involved in the conservation of these fascinating animals.

News

New Fungal Disease Confirmed in Virginia's Wild Snakes



Yohn Sutton and Amanda Guthrie drawing blood from a Brown Watersnake. (Photo: Kory Steele)



Measuring the Brown Watersnake. (Photo: Kory Steele)

Snake Fungal Disease (SFD) is an emerging disease believed to be impacting wild snake populations. Recent field research efforts have confirmed SFD in three species of snakes found in southeastern Virginia earlier this year. These mark the first documented presence of the fungus in Virginia. In total, five nonvenomous snakes tested positive for the fungus including one brown watersnake, two northern watersnakes, and two northern black racers. The research, conducted by Amanda Guthrie, DVM, DACZM of the Virginia Zoo with support from the Virginia Herpetological Society (VHS), will continue in 2015.

Snake fungal disease is believed to be caused by the fungus *Ophidiomyces* (formerly *Chrysosporium*) *ophiodiicola*. Although this fungus has been consistently associated with SFD, other species of fungi are often found as well. The symptoms of this disease include crusty scales or scabs, subcutaneous nodules, skin ulcers, thickening of the skin and cloudy eyes not associated with shedding. Mortalities have been associated with this disease, but the impact on wild snake populations is currently in need of more investigation.

This disease is known to affect a wide range of snake species that are native to Virginia including northern water snakes, northern racers, rat snakes, timber rattlesnakes, milk snakes and mud snakes. The disease is known to affect two other non-native species: massasauga rattlesnakes and pygmy rattlesnakes. Dr. Guthrie's research will add brown water snakes to the growing list of affected species; it is likely that other species are affected but have yet to be identified.

To date, the disease has been documented in 11 other states, including Georgia, Illinois, Florida, Massachusetts, Minnesota, New Jersey, New York, Ohio, South Carolina, Tennessee and Wisconsin. Although these are the only states with confirmed cases; the disease is likely to be present in other states as well.

The VHS saw the importance of documenting the potential presence of SFD in the state after numerous snakes with signs of SFD were encountered in an annual field survey in 2013 at Back Bay National Wildlife Refuge, in Virginia Beach, Virginia. The VHS provides annual grants, usually of \$500, to research and conservation efforts within the state. The VHS chose to fund a large portion Dr. Guthrie's materials and equipment costs. In doing so, the grant award was the largest single expenditure of funds in the VHS's 57 year history.

SFD is a new threat to wildlife and there is still a lot to be learned about this disease, its causes and pathogenicity. Research, like the project conducted by Dr. Guthrie, adds to the growing body of information about SFD.

The VHS is a 501(c)(3) nonprofit organization run entirely by volunteers and supported mostly through membership dues to the society. The Virginia Zoo is a 110 year old zoo accredited by the American Zoological Association. The Zoo has provided staffing and facility assistance and participates in several other conservation efforts.



Eastern Cottonmouths with typical (but unconfirmed) cloudy eye scales associated with SFD. (Photo: Dan Conley)

Researchers Studying how Animals Affected by Wetlands Loss

Posted: Feb 02, 2015 by Associated Press

BROOKINGS, S.D. (AP) - Some South Dakota researchers are using a federal grant to figure out what happens to the animals when a pond goes dry. How far the frogs, salamanders and ducks must travel to find another wetland is the focus of the work being done over three years by the South Dakota State University team.

The researchers say they'll evaluate the impact that changes in climate and land use have had on the connectivity of wetlands in the Prairie Pothole Region. The \$2.1 million National Science Foundation grant was split among five universities and focuses on balancing wetlands conservation and agricultural production.

The SDSU scientists will look at remote sensing data like satellite images and aerial photos to look at how changes have impacted wetlands over 35 years.

10th Annual Herp Blitz

This year, we will revisit Breaks Interstate Park. Our first survey there was in July of 2009. Since the property was large and our survey group was small, we decided to do a second survey to more adequately describe the herp biodiversity. The survey will be conducted on **Saturday, June 13th** and **Sunday June 14th**. Saturday's survey will be full-day and Sunday's will be a half.

Pre-registration is required. Please pre-register with Jason Gibson (frogman31@gmail.com). Visit the Breaks Interstate Park website at <http://www.breakspark.com> for lodging options.



	Northern VA	Richmond	Fredericksburg
2015 Dates	5/2, 8/29, 10/10, & 12/12	3/21, 7/25, & 10/24	4/4, 9/26, & 11/14
Location	Prince William County Fairgrounds 10624 Dumfries Rd Manassas, VA 20108	Richmond International Raceway Colonial Bldg 602 E Laburnum Ave Richmond, VA 23322	Fredericksburg Fairgrounds 2400 Airport Road Fredericksburg, VA 22401
Admission	\$8 adult/\$3 child	\$8 adult/\$3 child	\$8 adult/\$3 child
Time	9am-3pm		
Website	http://mdreptilefarm.com/category/shows/		

Upcoming Reptile Expos

Herp Trivia Solutions

Set 1 Identification:

1. Northern Ring-necked Snake (*Diadophis punctatus edwardsii*)
2. Upland Chorus Frog (*Pseudacris feriarum*)
3. Long-tailed Salamander (*Eurycea longicauda*)
4. Jefferson Salamander (*Ambystoma jeffersonianum*)
5. Green Frog (*Lithobates clamitans*)
6. Eastern Cottonmouth (*Agkistrodon piscivorus piscivorus*)

Set 2 Identification:

1. Eastern Hog-nosed Snake (*Heterodon platirhinos*)
2. Northern Watersnake (*Nerodia sipedon sipedon*)
3. Plain-bellied Watersnake (*Nerodia erythrogaster*), formerly Red-bellied Watersnake (*Nerodia erythrogaster erythrogaster*)
4. Marbled Salamander (*Ambystoma opacum*), a newly metamorphosed individual
5. Eastern Milksnake (*Lampropeltis Triangulum*)
6. Stripe-necked Musk Turtle (*Sternotherus minor peltifer*)

Questions:

1. Eastern Chicken Turtle (*Deirochelys reticularia reticularia*)
2. Box Turtles
3. A Guide to the Turtles of Virginia
4. Atlantic Coast leopard frog (*Lithobates kauffeldi*). OR, as the scientific paper describing it refers to *Rana kauffeldi*.
5. False
6. Snake Fungal Disease
7. Frogs (This initiative is being called "Virginia is for Frogs!")
8. 140 to 167 million years, which is 70 million years older than the previously known oldest snake fossils.



VIRGINIA IS FOR FROGS

Save Our Scales!

Updates from Reptile Rescues and Herps in Need of Homes

Virginians Interested in
Protecting Every Reptile



VIIPER is a reptile enthusiast and rescue organization based out of Virginia Beach, VA, that formed in February 2008. They intend to:

- Educate the public, especially children, about the roles that reptiles play to balance the ecosystem.
- Provide information on which reptile might suit you the best, proper housing, feeding techniques and general information.
- Provide demonstrations (free of charge) for local events & festivals, schools, church groups and parties.
- Take in unwanted, abandoned and abused reptiles, provide any needed medical attention and find them new homes.

Current pets available for adoption:

- One Ball Python
- One Cornsnake
- One Kingsnake



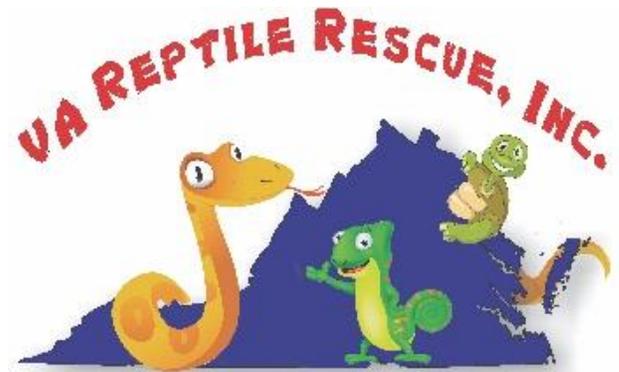
Motley Corn, available for adoption

Feel free to drop us a line anytime.

Email: viiper2008@yahoo.com

Facebook Page: www.facebook.com/viiper.us

Virginia Reptile Rescue (VARR)



Education for Preservation

WWW.VAREPTILERESCUE.ORG

Bonnie Keller has operated VARR since 1999 out of her home. She has tons of experience with captive reptiles along with plenty of compassion for them. VARR currently has several ball pythons, bearded dragons, and Russian tortoises up for adoption. Check out their website (vareptilerescue.org) and the following featured available animal:



This adult male Burmese Python is a repeat resident at VARR. He was adopted out, then returned when he was seized by animal control due to severe neglect of other reptiles in the home. He has no history of biting, but always seems hungry! Currently about 10 feet long but has the potential to reach 15 feet. Only those with verifiable experience handling large snakes need apply. Only VA residents, per Federal Law. He has recently started accepting frozen/thawed food, so he's much easier to care for; however, he has also had a strong feeding response develop, as he is not handled much other than at cleaning times.

Zoo Updates



We are still booking lots more public events for the summer of 2015. Check our public events page:

<http://reptilesalive.com/publicevents/publicevents.htm>

for the most current schedule.

Saturday April 25th 11 am-4 pm Lorton, VA

We will present our native herp show "Backyard Reptiles Alive!" at Mason Neck State Park's Eagle Festival at 11 am, 1 pm and 4 pm. In addition to our shows, there will be live birds of prey programs, wagon rides into the park, and guided kayak trips. This is a super fun festival that celebrates Virginia's natural heritage.

Saturday April 25th 11:45 am-3 pm, Lorton VA

On the same day, we will also be exhibiting a live reptile zoo featuring exotic reptiles and performing the show "Reptiles Alive!" on stage at SPRINGFEST at the Lorton Workhouse Arts Center. This another fabulous event with lots of activities for the whole family.

Here is a sample of the list of more upcoming events in Virginia where Reptiles Alive will be performing. All of these events are open to the general public and are great for all ages, but some events may require tickets. Please contact the venue for more information. This sample from the list only includes events in May, so be sure to check our [public events webpage](#) for other events coming up in late spring and into summer:

- Saturday, May 2nd 2:00pm-2:30pm
 - ☞ Reptiles Alive!
 - ☞ Doodlehopper 4 Kids
 - ☞ Springfield VA
- Saturday May 9th 12:00 noon-3:00pm
 - ☞ "Reptiles Alive + Reptile Encounters"
 - ☞ Prince William County Community Expo
 - ☞ Pfitzner Stadium Center
 - ☞ Woodbridge VA
- Saturday May 9th 2:00pm-2:30pm
 - ☞ Reptiles Alive!
 - ☞ Doodlehopper 4 Kids
 - ☞ Falls Church VA
- Wednesday May 13th 10:30am-11:15am
 - ☞ "Reptiles Alive!"
 - ☞ Fairfax Corner Shopping Center
 - ☞ Fairfax VA
- Saturday May 16th 1:00pm-1:45pm
 - ☞ "Reptiles Alive!"
 - ☞ Spring Carnival
 - ☞ St. Andrew the Apostle Catholic School
 - ☞ Clifton VA
- Wednesday May 20th 10:00am-10:45am
 - ☞ "Reptiles Alive!"
 - ☞ The Village at Leesburg
 - ☞ Leesburg, VA

At the Zoo:

Our breeding efforts have been great this year! Here is a list of some of our offspring, many of which are on exhibit:

- Meller's chameleons (*Trioceros melleri*)
- Solomon Island leaf frogs (*Ceratobatrachus guentheri*)
- Thorny devil stick bugs (*Eurycantha calcarata*)
- Standing's day gecko (*Phelsuma standingi*)
- William's dwarf gecko (*Lygodactylus williamsi*)
- Baron's racers (*Philodryas baroni*)
- Bog turtles (*Glyptemys muhlenbergii*)



We also have quite a few new acquisitions. The matamatas and anoles are on exhibit and are able to be seen by the public. The Cribos are being used by our education department.

- Matamata turtles (*Chelus fimbriata*)
- Smallwoods anoles (*Anolis smallwoodi*)
- Chinese crocodile lizards (*Shinisaurus crocodilurus*)
- Annulated boas (*Corallus annulatus*)
- Amazon basin emerald tree boas (*Corallus batesi*)
- Black tail cribo (*Drymarchon melanurus*)

We are also in the design phase of a renovation of our reptile building. There will be lots of exciting things to look for in the year 2016. -- *Dennis McNamara, Virginia Zoo*

International Zoo Research:

Zoos Partner to Fund Research into the Unusual Diet of Grey's Monitor Lizards to Improve the Management of the Captive Population of this Threatened Lizard

Researchers at Virginia Zoo have been awarded a Conservation Action Now grant from the Oklahoma City Zoo to help fund a joint conservation partnership project between Virginia Zoo and the herpetology staff of Oklahoma City Zoo that is being implemented in April 2015. Roger Sweeney, the Assistant Director of Virginia Zoo, is the principle investigator on the project entitled "Nutritional Analysis of Natural Fruit Items

Consumed by Gray's Monitor Lizard *Varanus olivaceus*" and will travel to the Polillo Island in the Philippines in early April to implement this project.



Gray's Monitor, Copyright © 2015 Ian Recchio, Los Angeles Zoo. All Rights Reserved.

The Gray's Monitor is a fascinating member of the Monitor Lizard family that has evolved a specialized frugivorous diet that is highly unusual for lizards of this family. The species is endemic to the Philippines and is listed as Vulnerable on the IUCN Red List; it has a small range area with severely fragmented habitat. A small captive population is held by American zoos but

challenges have been experienced replicating a healthy diet in captivity. This field work will better help us understand the nutritional values of natural food items for this species so the captive population can become more successful and play an increased role as a flagship for the conservation. Local collaborators with this project in the Philippines will include the University of the Philippines and the Polillo Islands Biodiversity Conservation Foundation. Results of research conducted in April are expected to be published later in 2015. -- Roger Sweeney, Virginia Zoo



Northern pine snake (*Pituophis melanoleucus*)



Connecting people to nature through educational experiences that promote conservation.



ACCREDITED BY THE ASSOCIATION OF ZOO & AQUARIUMS

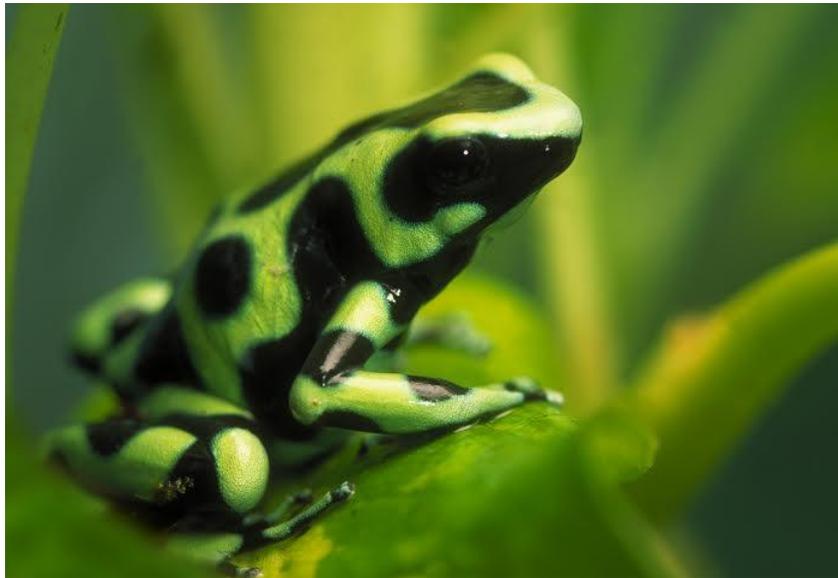


Northern Pine Snake Exhibit

Look for a Northern Pine Snake exhibit coming soon to the museum's Piedmont Gallery. This large black and white snake makes its home in the wild in its mountain forest habitat of west-central Virginia. It is rare to see it in the wild.

Frogs: A Chorus of Colors, March 14th through September 7th, 2015

Explore TOAD-ally cool creatures and get eyeball-to-eyeball with live frogs from around the world! View more than 70 live frogs from across the globe -- complete with their noisy croaks, yaps, chirps, whoops, snores and whistles -- all housed in detailed habitats



Green and black poison dart frog (*Dendrobates auratus*)



Deying poison frog (*Dendrobates tinctorius*)

with rock ledges, live plants and waterfalls. Interactive games and displays help visitors of all ages have fun while exploring frogs' biology and natural history, the roles they play in human cultures, their importance to ecosystems and the perils they face in a changing environment. If you've never thought of frogs as beautiful, this exhibition will change your mind! "Frogs: A Chorus of Colors" was created by Peeling Productions at Clyde Peeling's Reptiland. The exhibit is presented by EVB and sponsored by Daily Press, Peace Frogs, WAVY-10, Fox43, 94.9 The Point and the New 101.3. Admission \$17 for adults, \$13 for children ages 3-12.



Tomato frog (*Dyscophus antongilii*)

Join the VLM's FrogWatch USA chapter

Training sessions are beginning for the Virginia Living Museum's FrogWatch USA chapter. This citizen science program is designed to teach volunteers how to identify frogs based on their call, and to go out into the field at night to collect data on what they hear. Training is scheduled for April 4th and 11th at 1:00 P.M. the Museum. Both sessions are required to become a certified volunteer.

Contact VLM Herpetology Curator Travis Land, travis.land@thevlm.org if you are interested in attending. Additional training will be scheduled during the year.

For more information, call 757-595-1900, visit thevlm.org or follow the museum on Facebook. -- Virginia Gabriele, Marketing Director, Virginia Living Museum

VIRGINIA LITERATURE

These selections represent articles published or in press during the period September 2014 to February 2015. Included articles are focused on (1) studies performed within Virginia, (2) studies on reptiles or amphibians native to Virginia, or (3) additional herpetological topics that are of general interest. Compiled and formatted by Susan Watson and Joellen Welch.

- ☞ Moore, Jean-David, and Martin Ouellet. Oct 2014. A Review of Colour Phenotypes of the Eastern Red-backed Salamander, *Plethodon cinereus*, in North America. *Canadian Field-Naturalist*. Vol. 128(3): 250-259.

- ☞ Fredericksen, Todd S. Dec 2014. Thermal Regulation and Habitat use of the Eastern Box Turtle in Southwestern Virginia. *Northeastern Naturalist*. Vol. 21(4): 554-564.

- ☞ Stuart, Bryan L., Jose Rosado, and Paul D. Brinkman. Dec 2014. Albert Rogers Crandall's Smooth Green Snake (*Opheodrys vernalis*) from North Carolina . *Southeastern Naturalist*. Vol. 13(4): N37-N42.

- ☞ Burke, Russell L. and Arthur M. Calichio. Dec 2014. Temperature-Dependent Sex Determination in the Diamond-backed Terrapin (*Malaclemys terrapin*) . *Journal of Herpetology*. Vol. 48(4): 466-470.

- ☞ Coleman, Andrew T., Taylor Roberge, Thane Wibbles, Ken Marion, David Nelson, and John Dindo. Dec 2014. Size-Based Mortality of Adult Female Diamond-Backed Terrapins (*Malaclemys terrapin*) in Blue Crab Traps in a Gulf of Mexico Population. *Chelonian Conservation and Biology*. Vol. 13(2):140-145.

- ☞ Dickey, Meranda, Carolyn Cray, Terry Norton, Maureen Murray, Constance Barysauskas, Kristopher L. Arheart, Steven Nelson, and Marilyn Rodriguez. Sept 2014. Assessment of Hemoglobin Binding Protean in Loggerhead Sea Turtles (*Caretta caretta*) Undergoing Rehabilitation. *Journal of Zoo and Wildlife Medicine*. Vol. 45(3):700-703.

- ☞ Flower, Jennifer E., John Byrd, Carolyn Cray, and Matthew C. Allendar. Dec 2014. Plasma Electrophoretic Profiles and Hemoglobin Binding Protein Reference Intervals in the Eastern Box Turtle (*Terrapene carolina carolina*) and Influences of Age, Sex, Season, and Location. *Journal of Zoo and Wildlife Medicine*. Vol. 45(4):836-842.



-
- ☞ Siegel, Dustin S., Stanley E. Trauth, Justing L. Rheubert, Brian Rabe, Brenton Ruopp, Aurelien Miralles, Christopher M. Murray, and Robert D. Aldridge. Sept 2014. Novel Cloacal Glands in Snakes: The Phylogenetic Distribution of Ventral Urodaeal Glands in *Thamnophiini*. *Herpetologica*. Vol. 70(3):279-289.

 - ☞ Woolbright, Lawrence L., and Christopher P. Martin. Dec 2014. Seasonal Migration by Red-Backed Salamanders, *Plethodon cinereus*. *Journal of Herpetology*. Vol. 48(4):546-551.

 - ☞ Weir, Linda A., J. Andrew Royle, Kimberly D. Gazenski, and Oswaldo Villena. Oct 2014. Northeast Regional and State Trends in Anuran Occupancy from Calling Survey Data (2001-2011) from the North American Amphibian Monitoring Program. *Herpetological Conservation and Biology* 9(2):223–245.

 - ☞ Smith, Des H. V., Breana Jones, Lea Randall, and David R. C. Prescott. Oct 2014. Difference in Detection and Occupancy between Two Anurans: The Importance of Species-Specific Monitoring. *Herpetological Conservation and Biology* 9(2):267–277.

 - ☞ Riedle, J. Daren. Oct 2014. Demography of an Urban Population of Ring-necked Snakes (*Diadophis punctatus*) in Missouri. *Herpetological Conservation and Biology* 9(2):278–284.

 - ☞ Phillott, Andrea D., and D. John Parmenter. Oct 2014. Fungal Colonization of Green Sea Turtle (*Chelonia mydas*) Nests is Unlikely to Affect Hatchling Condition. *Herpetological Conservation and Biology* 9(2):297–301.

 - ☞ Eck, Ben, Alex Byrne, Viorel D. Popescu, Elizabeth B. Harper, and David A. Patrick. Oct 2014. Effects of Water Temperature on Larval Amphibian Predator-Prey Dynamics. *Herpetological Conservation and Biology* 9(2):302–308.

 - ☞ Parker, Scott L. Oct 2014. Physiological Ecology of the Ground Skink, *Scincella lateralis*, in South Carolina: Thermal Biology, Metabolism, Water Loss, and Seasonal Patterns. *Herpetological Conservation and Biology* 9(2):309–321.

 - ☞ Williams, Lori A., and John D. Groves. Dec 2014. Prevalence of the Amphibian Pathogen *Batrachochytrium dendrobatidis* in Eastern Hellbenders (*Cryptobranchus alleganiensis alleganiensis*) in Western North Carolina, USA. *Herpetological Conservation and Biology* 9(3):454–467. Submitted: 4 February 2014; Accepted: 19 September 2014; Published: 31 December 2014. 454

☞ Pitt, Amber L., and Max A. Nickerson. Dec 2014. Description and Comparison of Turtle Assemblages and Populations Located within a Spring-fed River. *Herpetological Conservation and Biology* 9(3):475–483.

☞ Mitchell, Joseph C., and Christopher A. Pague. Dec 2014. Filling Gaps in Life-History Data: Clutch Sizes for 21 Species of North American Anurans. *Herpetological Conservation and Biology* 9(3):495–501.



☞ Granatosky, Michael C., and Kenneth L. Krysko. Dec 2014. Morphological Variation in the Mediterranean House Gecko (*Gekkonidae*: *Hemidactylus turcicus*) along Geographical Gradients in the Southeastern United States. *Herpetological Conservation and Biology* 9(3):535–542.

☞ Glorioso, Brad M., and J. Hardin Waddle. Dec 2014. A Review of Pipe and Bamboo Artificial Refugia as Sampling Tools in Anuran Studies. *Herpetological Conservation and Biology* 9(3):609–625.

☞ Bevan, Elizabeth, Thane Wibbels, Blanca M. Z. Najera, Marco A. C. Martinez, Laura A. S. Martinez, Diana J. L. Reyes, Mauricio H. Hernandez, Daniel G. Gamez, Luis Jaime Pena, and Patrick M. Burchfield. Dec 2014. In Situ Nest and Hatchling Survival at Rancho Nuevo, the Primary Nesting Beach of the Kemp's Ridley Sea Turtle, *Lepidochelys kempii*. *Herpetological Conservation and Biology* 9(3):563–577.

☞ Joseph, Juanita, Chong Yee Kuen, Pushpa M. Palaniappan, and Liew Hock Chark. Dec 2014. Genetic Investigation of Green Turtles (*Chelonia mydas*) Harvested from a Foraging Ground at Mantanani, Sabah, Malaysia. *Herpetological Conservation and Biology* 9(3):516–523.

☞ Norman, Mitchell D. and Joseph C. Mitchell. 2014. Freshwater Turtles in the Blackwater River Drainage in Southeastern Virginia. *Banisteria*. No. 43.

☞ Mitchell, Joseph C. 2014. Amphibian and Reptile Communities in Hardwood Forest and Old Field Habitats in the – Central Virginia Piedmont. *Banisteria*. No. 43.

Virginia Natives: Eastern Spadefoot

SCAPHIOPUS HOLBROOKII

CHARACTERISTICS

This is the only spadefoot east of the Mississippi River. The eastern spadefoot measures 1 3/4 - 2 1/4 in. (4.4 - 5.7 cm.). It is usually brown, sometimes yellowish or quite dark, often mottled, with two light, yellowish, dorsal stripes extending from the eye down the back. The throat and breast are white and the belly is tinged with gray. The eyes are large and protruberant. This species emerges from its burrow only after heavy rain or during wet periods in warmer months. The eggs are laid on the bottom of a pond in irregular bands 25-55 mm long. The eggs are 1-2 mm in diameter and hatching occurs in 1 1/2-2 days. Transformation occurs from 2-8 weeks depending on the temperature and water level.



© Jason Gibson



Spadefoots have a sharp, black spade on each hind foot for burrowing into sand or loose soil. They also have inconspicuous paratoid glands (the bumps on the top of a toad's head), few warts, and vertically elliptical pupils.

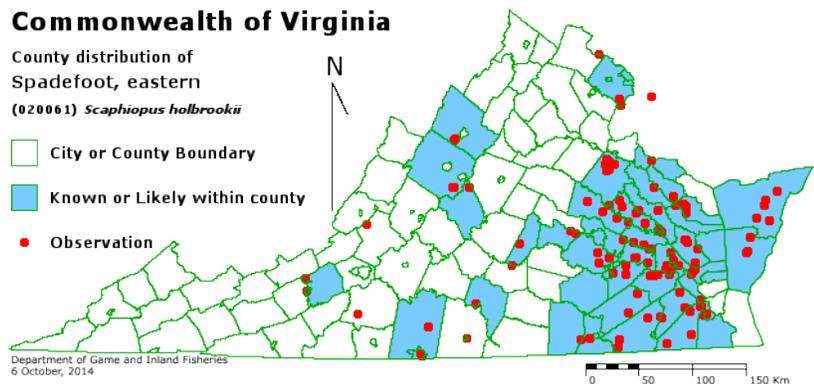
DISTRIBUTION

This species is usually found in areas characterized by loose sandy soils suitable for burrowing. It is well documented throughout most of the Coastal Plain due to many records of occurrence. Distribution appears to be rather sparse in the Piedmont and Blue Ridge, since there are only a few records. It is not certain if this part of its distribution is truly as sparse as the records show, or if there is simply a lack of documentation due to their behavior of only calling during or after extremely heavy rain storms, which may be few and far between for some years.

Commonwealth of Virginia

County distribution of Spadefoot, eastern (020061) *Scaphiopus holbrookii*

- City or County Boundary
- Known or Likely within county
- Observation





FOODS

Cannibalism is known to occur in tadpoles, and they will also eat phytoplankton, zooplankton, periphyton, and dead plants and animals. Adults will eat various terrestrial arthropods at night either way from, or at the mouth of, their burrows.



Common Name:	Eastern Spadefoot
Scientific Name:	<i>Scaphiopus holbrookii</i>
Genus:	<i>skaphis</i> is Greek for "shovel or spade", <i>pous</i> is Greek for "foot".
Species:	<i>holbrookii</i> is in honor of John Edwards Holbrook (1794-1871).
Average Length:	1.75 - 2.25 in. (4.4 - 5.7 cm)
Record length:	2.9 in. (7.3 cm)