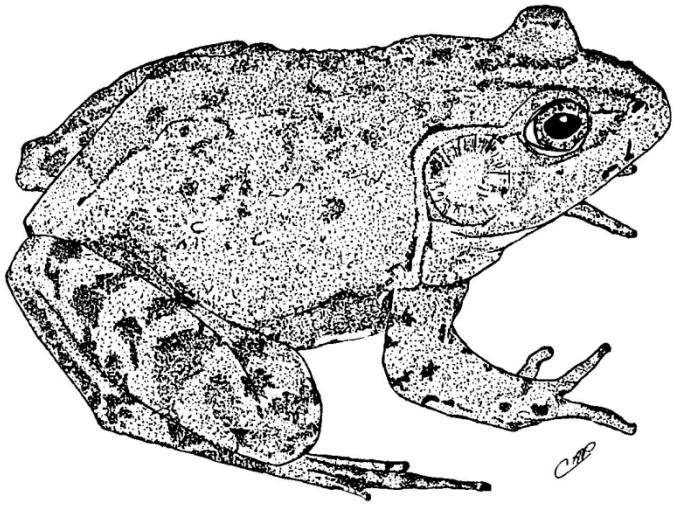
CATESBEIANA



BULLETIN OF THE VIRGINIA HERPETOLOGICAL SOCIETY

ISBN 0892-0761

Volume 33 **Spring 2013** **Number 1**

BULLETIN INFORMATION

Catesbeiana is published twice a year by the Virginia Herpetological Society. Membership is open to all individuals interested in the study of amphibians and reptiles and includes a subscription to Catesbeiana, two newsletters, and admission to all meetings. Annual dues for regular membership is $15.00. Payments received after September 1 of any given year will apply to membership for the following calendar year.

HERPETOLOGICAL ARTWORK

Herpetological artwork is welcomed for publication in *Catesbeiana*. If the artwork has been published elsewhere, we will need to obtain copyright before it can be used in an issue. We need drawings and encourage members to send us anything appropriate, especially their own work. Digital submissions are required.

EDITORIAL POLICY

The principal function of *Catesbeiana* is to publish observations and original research about Virginia herpetology. Rarely will articles be reprinted in Catesbeiana after they have been published elsewhere. All correspondence relative to the suitability of manuscripts or other editorial matters should be directed to: Dr. Paul Sattler, Editor, Catesbeiana, Department of Biology, Liberty University, 1971 University Blvd., Lynchburg, VA 24502 (email: psattler@liberty.edu).

Major Papers

Manuscripts for consideration of publication in *Catesbeiana* should be submitted to the Editor electronically. Consullt the style of articles in this issue for additional information, including the appropriate format for literature citations. The metric system should be used for reporting all types of measurement data. Computer diskettes or email attachments in Word format is desired for all papers. Submissions concerning the herpetofauna of selected areas, such as a park, city or county, should be prepared in article rather than field note format. Articles will be refereed by the editor and one or more qualified reviewers. All changes must be approved by the author before publication; therefore, manuscripts must be received by the editor before March 1 and August 1 to be considered for publication in the spring and fall issues, respectively, of *Catesbeiana*. Reprints of articles are not available, but authors may reprint their own articles to meet professional needs.

(Editorial policy continued on inside back cover)

CATESBEIANA

Bulletin of the Virginia Herpetological Society

Volume 33 Fall 2013 No.1

Contents

Next Meeting
May 3-4, 2013
Back Bay National Wildlife Refuge and False Cape State Park
Virginia Beach
See Page 34 for details.

Survey of Caledon Natural Area State Park

David A. Perry
316 Taylor Ridge Way
Palmyra, VA 22963

Introduction

Caledon Natural Area was originally established as Caledon plantation in 1659 by the Alexander family, founders of the city of Alexandria, Virginia. It remained in private hands until it was donated to the Commonwealth in 1974 by Mrs. Ann Hopewell Smoot. In 1981, the Caledon Task Force was appointed by Governor Robb to develop a management plan for Caledon to help protect the summering bald eagle population. A no-boating zone along the Potomac shoreline, limited public access trails and buffer zones were created to help protect bald eagle habitat. These limits have remained basically in place through August 2012, with some amendments. With the delisting of the bald eagle as an endangered species, plans were developed and approved on April 25, 2012 to expand public access at Caledon. Most likely these plans will be initiated in 2013.

Located in King George County, Caledon Natural Area is approximately 37 km (23 miles) east of Fredericksburg and about 97 km (60 miles) northwest of the confluence of the Potomac River and Chesapeake Bay. Within the park boundaries are a total of 1,044 hectares (2,579 acres) of diverse habitat; 953 hectares (2,355 acres) are forested (majority are mixed hardwood with some isolated softwood stands), 10.1 hectares (25 acres) are in old fields, 26.3 hectares (65 acres) are ponds and streams, 28.3 hectares (70 acres) are marshes, 6.1 hectares (15 acres) in Potomac shore and beach and 19.4 hectares (48 acres) are considered the original home site. Some of the marsh and pond areas were dry on 18 August, 2012, the day of the survey. The forested areas had many downed trees and logs, and the ground level was often dominated by the invasive plant species *Microstegium vimineum* (Japanese stiltgrass).

The Virginia Herpetological Society chose Caledon Natural Area because it had not previously been surveyed by the VHS, it provides a diversity of wildlife habitat with limited human imprint, and is located in King George County which has a plethora of likely but undocumented amphibian and reptile species. We had 20 volunteers on 18 August 2012 organized into four teams to survey four of the five habitat zones within the park. Mid-August was chosen for the survey because several VHS spring surveys were already scheduled and the potential for finding juvenile specimens was more likely at this time of year.

Survey Sites

The following were general descriptions of the survey sites. Coordinates were either taken from the published Caledon State Park map or were specific GPS coordinates provided by the survey team leaders. No GPS readings or map coordinates were available for Zone 5.

Zone 1-Area 1- Jones Pond and Loop (38°21.5932, -77°08.6431)
This area included Jones Pond, a freshwater impoundment adjacent to Potomac shoreline and beach and a loop trail through mixed woodlands and dry marsh, west of the pond. The pond water level was mostly low, but dry in the southwesterly portion. A wooded area lined the edge of the dry portion of the pond bed.

Zone 1 -Area 2-Crotank Creek (38°21.2291, -77°03.4906)
This area was wetland/stream habitat with typical wetland/marsh vegetation of reeds and tall grass.

Zone 2-Area 1- Boyd's Hole (38°21.5932, -77°08.6044)
This area was primarily Potomac shoreline and beach and adjacent trails into mostly upland mixed hardwood stands of *Quercus phellos* (willow oaks), *Quercus alba* (white oaks), *Liriodendron tulipfera* (tulip poplar), *Cornus* (dogwood), *Liquidambar styraciflua* (sweet gum) and *Ilex opaca* (American holly). Ground vegetation included Japanese stiltgrass. Within the woods were some low and moist areas.

Zone 2-Area 2- Triangle Field (38°20.3730, -77°09.4030)
This area was an old field and meadow bordered by woods consisting of some *Pinus taeda* (Loblolly Pine) and *Pinus virginiana* (Virginia pines) and hardwoods such as *Fagus sylvatica* (Common beech), *Quercus (*oaks), *Acer rubrum* (red maple) and American holly. Ground vegetation included *Mitchella repens* (partridge berry) and *Galutheria procumbens* (wintergreen). A low spot in the woods contained an intermittent stream with puddles of water.

Zone 3- Loop Trails (First Trail -Fern Hollow) (38°20.0370, -77°08.5820)
This area consisted of 11.43 km (7.1 miles) of 6 interconnected trails through mixed hardwood forest. The trails became slightly more elevated moving east. The other 5 trails and their coordinates were identified in the Caledon State Park map, which was available on the Caledon website.

Zone 4- Caledon Marsh (38°20.4073, -77°09.4182)
This area was a relatively deep brackish water marsh directly affected by Potomac River tidal flow. The marsh boundary contained deep stands of tall reeds.

Zone 5-Area 1 Mount Stuart
This hardwood forest area contained tulip poplar, oak, sweet gum stands and had steep ravines that contained a couple of intermittent streams which were dry but with puddles in a few locations. The forest floor was littered with logs and downed trees. Japanese stiltgrass was the predominant ground cover.

Zone 5- Beaver Pond
This area was mixed hardwood forest which contained a freshwater beaver pond fed by an intermittent stream. The intermittent stream was dry but the beaver dam was intact and the pond was full. The pond contained many downed logs and dead trees (both standing and down) and the pond bordered tall grasses, shrubs and other marsh vegetation.

Materials and Methods

Twenty volunteers participated in the survey for five hours (from 09:00 to 14:00) in the field on 18 August 2012 for a total of about 100 man hours. Due to the large acreage and diverse habitat to be surveyed, four teams were organized to survey four of the five habitat zones within the park. The first team consisted of five people and was tasked to survey Zone 1. The second team included four people who surveyed Zone 2. The third team surveyed Zone 3 with nine people. Zone 5 was considered the steepest and most strenuous area and was surveyed by two people. On 17 August 2012, two turtle traps were positioned within Caledon Marsh (the habitat Zone 4 that was not surveyed) and one turtle trap was positioned in Jones Pond. Ten people stayed for an extra hour (from 15:00 to 16:00) to observe the pulling of turtle traps from Jones Pond and Caledon Marsh. Throughout the day, the skies were mostly sunny with light winds and temperatures ranged from 22.2°C (72°F) to about 29.4°C (85°F).

Table 1 provides the amount of survey effort for each Zone. Survey participants used multiple collecting methods to find amphibians and reptiles, including visual observation, listening for calling anurans, hand capture, and over-turning objects with the use of snake hooks and field sticks. All captured animals were observed to identify possible malformations, injuries or disease and other unique markings and characteristics. Digital photos were taken of many of the captured animals including specimens of all of the King George County records identified. Survey group leaders summarized and submitted all relevant data on VHS survey group data sheets. Group leaders for survey Zones 1 & 3 also recorded specific GPS coordinates for many of the animals captured or observed within their survey zone. This information has been tabulated and will be included in the final report for park personnel.

Table 1-Effort per Survey Zone

Caledon	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
No. of people	5	4	9	Traps Only (2)	2
Hours surveyed	5	5	5	0.5	4.5
Man-hours expended	25	20	45	1	9

Results

During the survey a total of 22 species were captured or positively observed, including 11 each from the Class Amphibia and Reptilia. The survey produced a total of 8 frog, 3 salamander, 4 lizard, 3 turtle and 4 snake species. More than 143 individual animals were positively identified. In addition 8 King George County records were documented and digitally photographed. Frogs dominated the list of animals captured or observed with more than 111 animals positively identified. In addition, many toads were captured but could not be positively identified to species, also an abundance of frogs were observed but could not be captured for positive identification. Table 2 summarizes the survey results; King George County records are denoted with an asterisk. Most of the county records (7) are of species with wide distribution in Virginia.

Table 2. Results of the Caledon Natural Area State Park. (Site 1A=Jones Pond, Site 1B=Crotank Creek, Site 2A=Boyd's Hole, Site 2B=Triangle, Site 3=Five Loop Trail, Site 5A=Mount Stuart, Site 5B=Beaver Pond). *Indicates new King George County records.

Site/Species	1A	1B	2A	2B	3	5A	5B	Sub-Total
Class Amphibia								
***Lithobates sphenocephalus**		>3	20		15			>38
Acris crepitans	>4	>3	>20	>10	2		1	>40
Pseudacris crucifer					1	1		2
Lithobates palustris					2			**2**
Lithobates clamitans		>4	2		1		4	**>11**
Lithobates catesbeianus		>3					>2	**>5**

Anaxyrus americanus			1		6	1		**8**
**Notophthalmus viridescens*			1				1	**2**
Desmognathus fuscus				2 larvae	2			**4**
Ambystoma maculatum			2					**2**
**Hyla cinerea*					3			**3**
Sub-Total	**>4**	**>13**	**>46**	**>14**	**32**	**2**	>8	**>117**
Class Reptilia								
Sceloporus undulatus							1	1
**Plestiodon laticeps*				1				1
Plestiodon fasciatus	1	1	1	1	4		1	9
** Scincella lateralis*			1					1
Terrapene carolina					2			2
** Kinosternon subrubrum*	1 (shell)							1
**Chelydra serpentina*	1							1
Carphophis amoenus					2			2
**Coluber constrictor*		1	1					2
Pantherophis alleghaniensis	1	1						2
Nerodia sipedon sipedon	1	1					2	**4**
Sub-Total	**5**	**4**	**3**	**2**	**8**		**4**	**26**

Annotated Check List
Amphibians

1. *Lithobates sphenocephalus utricularius** (Southern Leopard Frog)
At least 38 Southern Leopard Frogs were observed in Zones 1, 2 and 3. Most were adults and were observed in marsh/wetland environments and in low damp wooded areas. Many were jumping prior to capture. Digital photos were deposited in the VHS Archive (#244) to document this record.

2. *Acris crepitans* (Eastern Cricket Frog)
At least 40 Eastern Cricket frogs were observed with at least one specimen within each of the zones surveyed. Many were found in grass near wetlands and within marshy areas. One specimen in Zone 5 was captured near a dry streambed. Most were actively jumping.

3. *Pseudacris crucifer* (Spring Peeper)
Two adult individuals were identified. The specimens in both Zone 3 and 5 were captured while jumping among tall plants in marshy areas.

4. *Lithobates palustris* (Pickerel Frog) Two adult specimens were observed in Zone 3 jumping in marsh drainage areas. An abundance of anurans were observed jumping from tall grasses into the beaver pond in Zone 5 but capture and positive ID could not be established between *Lithobates sphenocephala or Lithobates palustris.*

5. *Lithobates clamitans* (Green Frog) More than 13 specimens were identified, all of which were adults. At least one individual was found in each of the four zones surveyed. Four were sitting on logs and in the beaver pond in Zone 5 and at least one of these could be heard calling. Individuals identified in Zones 1, 2 & 3 were in marshy wet areas.

6. *Lithobates catesbeianus* (American Bullfrog) More than 3 American Bullfrogs were identified within the marshy areas along Crotank Creek in Zone 1. Two adult specimens were observed at the water's edge of the beaver pond in Zone 5 and one of these could also be heard calling.

7. *Hyla cinerea** (Green Treefrog)
Three adult Green Tree frogs were identified in Zone 3 sitting on the stalks of tall plants in a marsh drainage area. A Digital photograph was deposited in the VHS Archive (#242) to document this record.

8. *Anaxyrus americanus americanus* (Eastern American Toad)
One young adult Eastern American Toad was found in Zone 2 hopping alongside a wooded edge next to a road. Three young adults and 3 mature adults were found in Zone 3 in and alongside mixed hardwoods. One juvenile was found in Zone 5 alongside a dry streambed. All were active and jumping/hopping.

9. *Notophthalmus viridescens viridescens** (Red Spotted Newt)
One red eft was captured in Zone 5 while wriggling out of a hole in a log near a dry stream bed that fed the beaver pond in Zone 5. A young adult in Zone 2 was found resting under a log in a moist wooded area. Digital photographs were taken of both the eft and the young adult. A digital photograph was deposited in the VHS Archive (#243) to document this record.

10. *Desmognathus fuscus* (Northern Dusky Salamander) Two clutches of larvae were observed in the water in the Triangle Field area and a sample of one of the clutches was taken for positive identification. Two young adults were found in the water in a marshy area within Zone 3.

11. *Ambystoma maculatum* (Spotted Salamander)
One sub-adult and one adult Spotted Salamander were found resting under logs in the woods at the edge of the woods in Zone 2.

Reptiles
12. *Sceloporus undulates* (Eastern Fence Lizard)
One adult Eastern Fence Lizard was found just north of the beaver dam in Zone 5 resting on a tree stump.

13. *Plestiodon laticeps** (Broad-Headed Skink)
One adult female Broad-Headed Skink was identified in Zone 3 running and basking within a marshy area within the woods. It appeared that the skink had mites or chiggers. A digital photograph was deposited in the VHS Archive (#241) to document this record.

14. *Plestiodon fasciatus* (Common Five Lined Skink)
Nine Common Five Lined Skinks were found with at least 1 specimen within each survey zone. Two adults in Zone 1 were found basking on dead/rotten trees. Two young adults were found basking/running on oak trees. Of the 4 found in Zone 3, three juveniles were found hiding under log/tree bark. The adult observed in Zone 5 was basking on a stump at the beaver pond edge and missing its tail.

15. *Scincella lateralis** (Little Brown Skink)
A young adult Little Brown Skink was located resting under a log and leaf litter in Zone 2. A digital photograph was deposited in the VHS Archive (#245) to document this record.

16. *Terrapene carolina carolina* (Eastern Box Turtle)
Two adult Eastern Box Turtles were found in Zone 3. Both were out of their shells with one resting next to a dead tree and the other resting next to a log.

17. *Kinosternon subrubrum subrubrum** (Eastern Mud Turtle)
The shell of an Eastern Mud Turtle was found in Zone 1 in the vicinity of Jones Pond. A digital photograph was deposited in the VHS Archive (#249) to document this record.

18. *Chelydra serpentina** (Snapping Turtle)
A young adult Snapping Turtle was caught in the turtle trap positioned in about 0.5 m(1.5 feet) of muddy water at the eastern end of Jones Pond. The turtle was missing its right eye but appeared healthy otherwise. A digital photograph was deposited in the VHS Archive (#225) to document this record.

19. *Carphophis amoenus amoenus* (Eastern Wormsnake)
Two adult Eastern Wormsnakes were found in Zone 3. One was found hiding under a log in an upland wooded area and the other under a log near a marsh.

20. *Coluber constrictor constrictor** (Northern Black Racer)
A large adult Northern Black Racer was identified moving in high grass near a marsh in Zone 1. Another adult Northern Black Racer was found basking in a small open patch within a wooded area of Zone 2. A digital photograph was taken of the Zone 2 specimen and deposited in the VHS Archive (#246) to document this record.

21. *Pantherophis alleghaniensis* (Eastern Ratsnake)
One adult Eastern Ratsnake was found basking on the gravel road near a gazebo and where the survey cars were parked near Jones Pond. A juvenile Eastern Ratsnake was found in Crotank Creek wetland area on a tree by the road.

22. *Nerodia sipedon sipedon* (Common Watersnake)
One adult common watersnake was found resting on a log alongside Jones Pond. Another adult was identified in the marsh area near Crotank Creek. One adult and one young adult (clear pattern) were found near the beaver dam in the vegetation on the banks of the Beaver Pond.

Discussion

On the single day survey of Caledon Natural Area, the VHS found more than 143 specimens representing 22 species (Table 2). There were 11 species of amphibians (8 anurans and 3 salamanders) and 11 species of reptiles (3 turtles, 4 lizards and 4 snakes).

Of the species observed on the Caledon survey, eight represented King George County records: *Lithobates sphenocephalus utricularius, Hyla cinerea, Notophthalmus viridescens viridescens, Plestiodon laticeps, Scincella lateralis, Kinosternon subrubrum subrubrum, Chelydra serpentina and Coluber constrictor constictor.* Despite the fact that they were not previously documented for King George County, some of these county records are found widely distributed throughout Virginia and could be expected in most surveys

(Mitchell and Reay, 1999). These widespread species would include: *Notophthalmus viridescens viridescens, Chelydra serpentina and Coluber constrictor constrictor. Lithobates sphenocephalus utricularis* is abundant and *Scincella lateralis, Kinosternon subrubrum subrubrum* and *Hyla cinerea* are common in the coastal plain and eastern Virginia. *Plestiodon laticeps* has a spotty distribution statewide.

Other species found during the survey which have widespread distribution statewide include: *Acris crepitans, Pseudacris crucifer, Lithobates palustris, Lithobates clamitans melanota, Lithobates catesbeianus, Anaxyrus americanus americanus, Desmognathus fuscus, Ambystoma maculatum, Sceloporus undulates, Plestiodon fasciatus, Terrapene carolina carolina, Carphophis amoenus amoenus, Pantherophis alleghaniensis and Nerodia sipedon sipedon.*

Anurans are abundant within Caledon Natural Area. More than 111 of the positively identified specimens were anurans and many others were sighted that could not be captured or positively identified. Healthy populations were encountered in all of the wet environments within all of the zones surveyed. Two of the anuran species documented in King George County, i.e. *Hyla chrysoscelis* (Cope's Gray Treefrog) and *Hyla versicolor* (Gray Treefrog) were not found or heard during the survey.

Several species of salamanders known to occur in King George County were not found during the survey. *Ambystoma opacum* (Marbled Salamander), *Plethodon cinereus* (Eastern Red-backed Salamander), *Eurycea cirrigera* (Southern Two-Lined Salamander), *Pseudotriton montanus montanus* (Eastern Mud Salamander), *Pseudotriton ruber ruber* (Northern Red Salamander) and *Plethodon cylindraceus* (White Spotted Slimy Salamander) were not found during the survey. Perhaps this can be explained by the dry conditions in the park and/or the time of year.

In addition to the new King George County records found for the lizard species *Plestiodon laticeps* and *Scincella lateralis,* both of the previously known lizard species *Sceloporus undulatus* and *Plestiodon fasciatus* were also identified.

Aquatic turtle species were notably lacking. One shell (*Kinosternon subrubrum subrubrum)* was found and one live animal (*Chelydra serpentina)* was trapped. Not a single basking turtle was sighted at Jones Pond, Caledon Marsh or the Beaver Pond. Water levels in Jones Pond were low and Caledon Marsh is a brackish wetland, which might explain the lack of sightings there. The Beaver Pond was full of water however, with many basking sites on downed trees and logs. *Chrysemys picta picta* (Eastern Painted Turtle) has been documented in King George County. The absence of sightings of this species during the VHS survey (especially within the Beaver Pond area) is hard to explain. However, one vacated turtle nest (unknown species) was found near the beaver dam. Two specimens of *Terrapene carolina carolina* were located in Zone 3.

Three snake species observed in 2012 at Caledon by State Park personnel, *Agkistrodon contortrix mokasen* (Northern Copperhead), *Heterodon platirhinos* (Eastern Hog-nosed Snake) and *Opheodrys aestivus aestivus* (Northern Rough Greensnake) were not found during this survey. These species may be less common than the other snakes encountered. Although known within the park, each of these species might escape detection during a one day survey. Other snake species known from King George County but not observed during the survey include: *Diadophis punctatus edwardsii* (Northern Ring-necked Snake), *Pantheropis guttatus* (Red Cornsnake), *Lampropeltis getula getula* (Eastern Kingsnake), *Storeria dekayi dekayi* (Northern Brownsnake) and *Storeria occipitomaculata occipitomaculata* (Northern Red-bellied Snake). Most of these species are highly secretive and are not often turned-up in any VHS survey. The one exception is *Diadophis punctatus edwardsii,* which is common, widespread and surprisingly absent from this survey at Caledon.

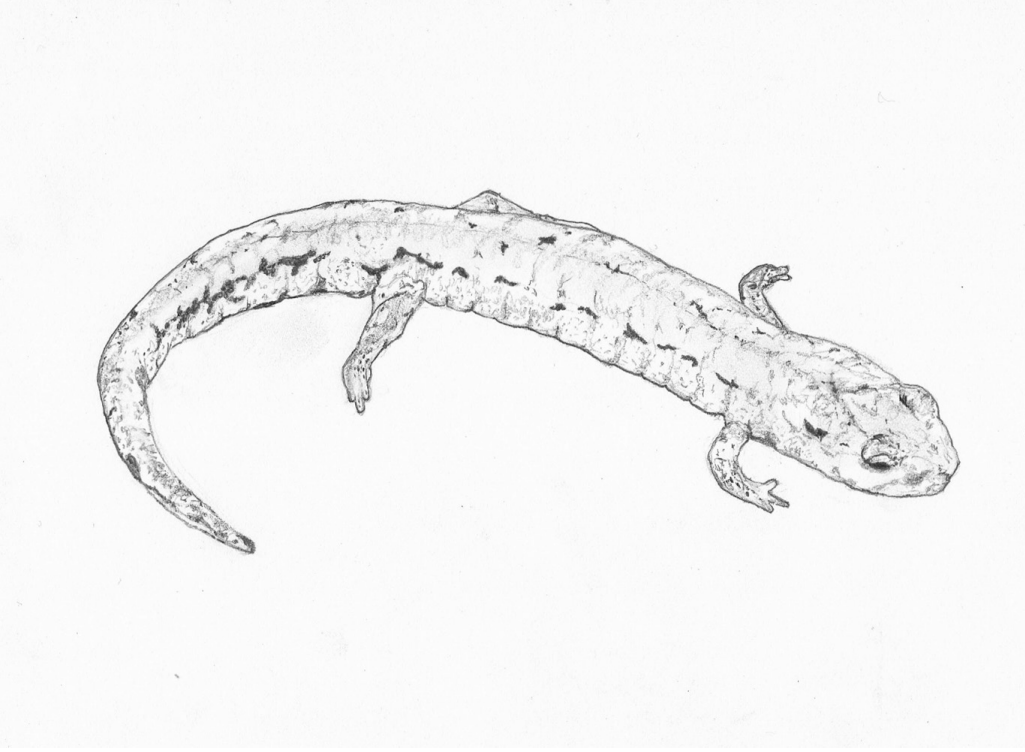
There are several relatively common species with statewide or eastern state distribution that are likely but not yet known within King George County. Some of these are: *Anaxyrus fowleri* (Fowler's Toad), *Plestiodon inexpectatus* (Southeastern Five-lined Skink), *Regina septemvittata* (Queen Snake), *Thamnophis sirtalis sirtalis* (Eastern Gartersnake), *Thamnophis sauritus sauritus* (Common Ribbonsnake), *Virginia valeriae valeriare* (Eastern Smooth Earthsnake), *Sternotherus odoratus* (Eastern Musk Turtle) and *Pseudemys rubriventris* (Northern Red-bellied Cooter). With the heightened awareness for the need for county record documentation created during the VHS survey, we can expect that State Park personnel and members of the local chapter of the Master Naturalist's Association (who participated in the VHS survey) might be able to document the presence of some of these species in the future.

Acknowledgements

The VHS would like to provide a special thanks to Nina Cox, Sammy Zambon and Paul Billings, the Virginia State Park personnel who made the VHS survey happen on August 18. Participating in the survey were the following (in alphabetical order): Craig Abbott, Paul Billings, Diane Bowen, Dan Chandler, Chrales Hoysa, Larry Mendoza, Matt Neff, Elise Newton, Monte Newton, Tracy Newton, Lauria Paul, Michelle Paul, Jennifer Pennington, Dave Perry, Joanne Perry, Jim Scibek, Caroline Seitz, Becky Taft, Susan Watson and Sammy Zambon.

Literature Cited

Mitchell J.C. and Reay K.K. 1999 Atlas of Amphibians and Reptiles in Virginia. Spec. Publ. 1, Virginia Dept. Game and Inland Fisheries, Richmond, VA 122 pp.



Survey of the Shenandoah River State Park

Paul Sattler
Department of Biology
Liberty University
1971 University Blvd.
Lynchburg VA 24502

Larry Mendoza
19535 Newberry Terrace #303
Lansdowne, Va. 20176

Introduction

The Andy Guest/Shenandoah River State Park is named for Andy Guest, a state delegate representing Warren County for 28 years (1971-1999) who championed land and wildlife conservation. The Park consists of 650 hectares, all but 60 are forested with 9 km of riverfront along the South Fork of the Shenandoah River. The Park opened in May 1999. The terrain is a combination of low floodplains, rolling hills and mountains. There are scenic views of Massanutten Mountain to the west and Shenandoah National Park to the east. The Park lies in Warren County 12 kilometers south of Front Royal and 24 kilometers north of Luray, off Route 340 in Bentonville. There are 17 trails for a combined 38 km of interconnecting trails. The Virginia Herpetological Society had done little work in Warren County, so this survey added valuable information to our understanding of the herpetofauna of the county.

Methods and Materials

The Shenandoah River State Park was surveyed on 19-20 May 2012 by the Virginia Herpetological Society as part of the Spring Meeting. We had almost 50 volunteers come out to survey the park for amphibians and reptiles. On both days of the survey, groups performed visual surveys along various trails running through the park, searching the ground, under rocks and logs, listening for vocalizing anurans, and dip netting for aquatic amphibians. Several turtle hoop traps were set in the Shenandoah River and oxbow ponds in the floodplain. Animals that were hand captured were inspected for disease and parasites. Team leaders recorded the numbers and microhabitat where each species was found.

Study Sites:

Site 1. Cottonwood Trail
The Cottonwood Trail, located in the northeastern part of the park, was a raised boardwalk up to a meter above the ground, running in the floodplain of the Shenandoah River. It was characterized by an open habitat dominated by herbaceous plants including jewelweed, poison ivy and grasses. There were occasional marshy areas and depressions filled with shallow water.

Site 2. Wildcat Ledge Trail
The Wildcat Ledge Trail, located in the northeastern part of the park, ran through a dry upland mixed hardwood forest. Dominant trees included chestnut oak, hickory and a few pines. The understory was sparse, mostly consisting of blueberry bushes. The trail ascended Wildcat Ledge, accompanying an increase in elevation to a lookout area at the northeastern end of the park.

Site 3. Point Trail
Point Trail ran through dry upland hardwood forest dominated with oak, hickory, locust and maple in the eastern part of the park. The trail wound through hills and ravines. It crossed several streams, only one had water at the time of the survey. There was little understory.

Site 4. Allen's Mountain Trail
West of Point Trail is Allen's Mountain Trail, which ran through dry upland hardwood forest. It goes to the highest point in the Park, on Allen's Mountain. There was a stream crossed by the trail.

Site 5. Bluebell Trail
The Bluebell Trail ran along the floodplain of the Shenandoah River. It included a shallow oxbow pond about 50 meters from the river where turtle hoop traps were set. The trail was surrounded by hardwoods, mostly box elder. There were some low wet areas, but no deep pools. The elevation increased on the side of the trail opposite from the river where there were some areas of large flat shale. The trail led to the campground, where the habitat was open. There was an area of rip rap between culverts at the trail and the campground. There were open grassy areas between campsites, more rip rap, and a small pool of water at a culvert that ran under the campground road.

Site 6. Hemlock Hollow, Campground and Overlook Trails
These trails ran along the slope just above the floodplain of the Shenandoah River through mixed hardwood, mostly oak, and pine forest. These forest habitats did not have as much understory as the floodplain forest habitat. These trails led from the campground to the overlook, then to the Visitor Center and the picnic area parking lots. There was a stream in the forest habitat that the Campground trail went through (between the campground and the overlook). Habitat at the Visitor Center included the open area in front of the center where a small fish pond and flowing stream had been constructed. Some native plants had been planted around the stream.

Site 7. Bear Bottom Loop Trail
In the southwestern part of the park, the Bear Bottom Loop Trail ran through rolling hills containing a hardwood forest. Oak, hickory, maple and tulip trees were present. The understory was spotty in distribution and included raspberry, blueberry, cedars and grapevine. There were several streams which we followed from the trail down to the Shenandoah River.

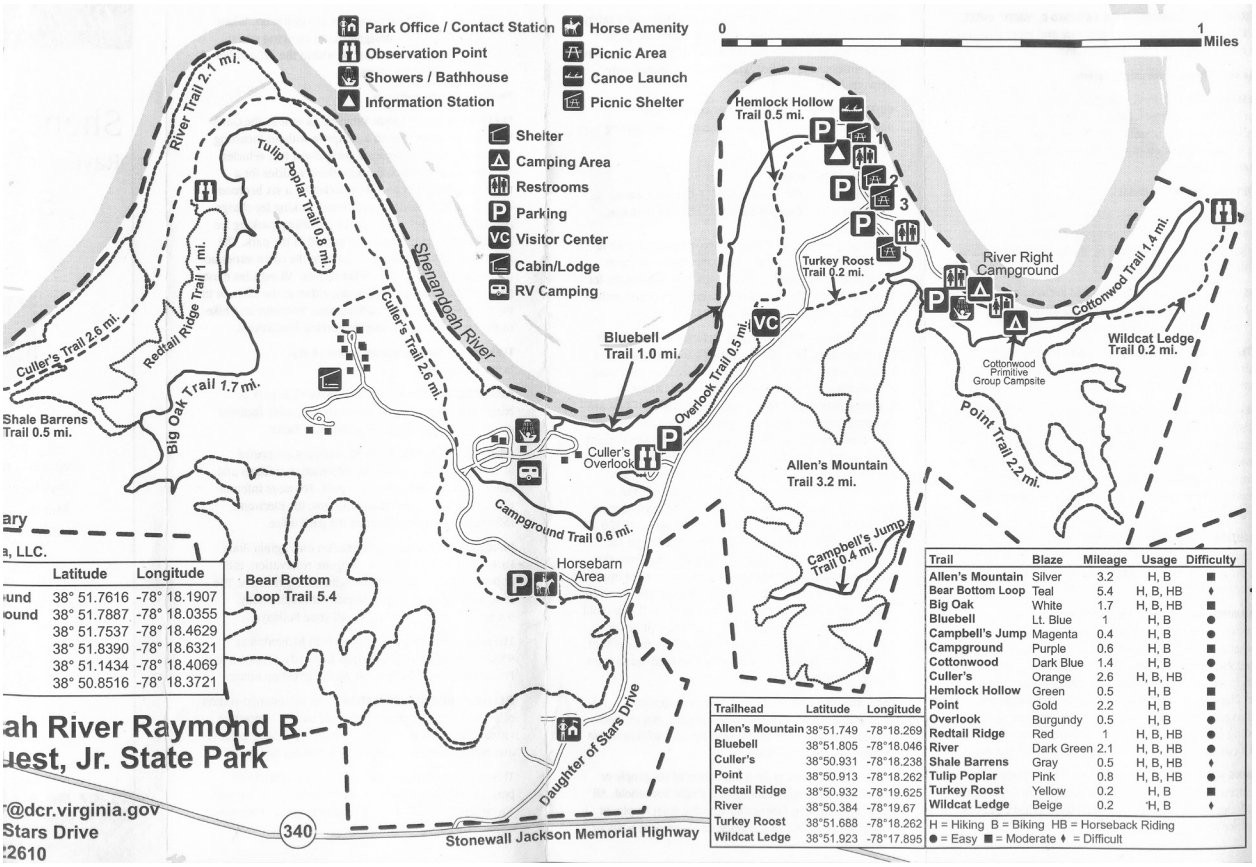
Site 8. River Trail
The River Trail followed the Shenandoah River at the southwestern end of the park. It included a tree line composed of oak, tulip, and pines. The river banks were steep and overgrown with weeds, shrubs and high grass. River access was difficult in most locations. An oxbow pond in the river's floodplain was also present.

Site 9. Culler's Trail
Culler's Trail ran between a hillside and upland of mixed hardwood/ pine forest and a large meadow with high grasses. Dominant hillside trees included oak, pine, hickory and tulip.

Site 10. Shale Barrens Trail

The Shale Barrens Trail ran through dry upland hardwood forests. This trail wound around a ridge that cut through shale deposits on a steep hillside. The soil was thin and the exposed shale deposits made for an arid habitat.

Figure 1. Map of the Shenandoah River State Park Trails (taken from the State Park brochure).



Results

Previous to our survey, there had been 41 species of amphibians and reptiles reported for Warren County (VADGIF FWIS Database). This included 9 anurans, 13 salamanders, 2 lizards, 5 turtles and 12 snake species. There were 16 species of amphibians observed at the VHS survey of Shenandoah River State Park, including 7 species of anurans and 9 species of salamanders. There were 18 species of reptiles observed, including 3 species of lizards, four species of turtles, and eleven species of snakes. Altogether, we found 31 (Table 1) of the previously reported 41 species, or 73% of the known species, which makes this one of the most successful VHS surveys. We also added three species to the known herpetofauna (*Ambystoma opacum, Plestiodon laticeps* and *Regina septemvittata*) of the county. Interestingly, others had discovered records for Warren County (*C. amoenus* and *P. rubiventris*) just prior to our survey (Milner, 2011; Saik, 2012).

Table 1. Amphibians and Reptiles of Shenandoah River State Park. * = County Records.

Amphibians/Site	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	Total
Anurans											
Anaxyrus americanus	1			1		1				1	4
Anaxyrus fowleri			1		1	3	1		1		7
Hyla versicolor	1	1					2		1		5
Lithobates catesbeianus						2					2
Lithobates clamitans						7	2				9
Lithobates palustris							2				2
Pseudacris crucifer	1										1
Salamanders											
Ambystoma maculatum					1						1
Ambystoma opacum *		1									1
Desmognathus fuscus			5	4			3				12
Eurycea bislineata			1				2				3
Eurycea longicauda							6				6
Notopthalmus viridescens		2									2
Plethodon cinereus	1		5	5	23	1	19		11	1	66
Plethodon cylindraceus							1				1
Pseudotriton ruber							1				1
Reptiles											
Lizards											
Plestiodon fasciatus		2	2		3		3		9	3	22
Plestiodon laticeps *			1							1	2
Sceloporus undulatus	1	6	4	2	7		8		2	11	41
Turtles											
Chelydra serpentina					2						2
Chrysemys picta					2	1		1	1		5
Pseudemys rubiventris								2	1		3
Terrapene carolina	1		1	3	1		5		1		12
Snakes											
Agkistrodon contortrix							1		2		3
Carphophis amoenus		4	5	2	7	7	6		1	2	34
Coluber constrictor									3		3
Diadophis punctatus		3					10		1	2	16
Lampropeltis triangulum									1		1
Nerodia sipedon					2		1	1			4
Opheodrys aestivus							1				1

Pantherophis alleghaniensis	2						1		1		4
Pantherophis guttatus									2		2
Regina septemvittata *							1				1
Thamnophis sirtalis		1									1
Total	8	21	24	17	49	22	76	4	39	21	281

Annotated Species List:

(Numbers in parenthesis are the sites where individuals were observed.)

Anurans

Anaxyrus americanus (American Toad) (1, 4, 6, 10)
American Toads were found at several sites. Most were out in the open foraging on the forest floor.

Anaxyrus fowleri (Fowler's Toad) (3, 5, 6, 7, 9)
Fowler's Toads were observed at several sites. Some were out foraging on the forest floor. Others were secluded under rocks, logs and boards.

Hyla versicolor (Gray Treefrog) (1, 2, 7, 9)
Gray Treefrogs were heard calling at several sites. The calls allowed identification as *Hyla versicolor* rather than *H. chrysoscelis*.

Lithobates catesbeianus (American Bullfrog) (6)
Bullfrogs were observed in the man-made stream at the Visitor's Center.

Lithobates clamitans (Northern Green Frog) (6, 7)
Green Frogs were observed along streams at Site 7, and along the man-made stream at the Visitor's Center at Site 6. Males were calling both by day and at night at the Visitor's Center.

Lithobates palustris (Pickerel Frog) (7)
Pickerel Frogs were found along streams at Site 7 only.

Pseudacris crucifer (Spring Peeper) (1)
A larval Spring Peeper was found in a vernal pond along the Cottonwood Trail on the north end of the Park.

Salamanders:

Ambystoma maculatum (Spotted Salamander) (5)
A single adult Spotted Salamander was found under a log in a wetland at the edge of the Shenandoah River.

Ambystoma opacum (Marbled Salamander) (2)
An adult female was found under a log at N38° 52' 07.2" W78° 17' 47.9". The salamander was photographed and a digital voucher of this new county record deposited in the VHS Archive (#238).

Desmognathus fuscus (Northern Dusky Salamander) *(3, 4, 7)*
Dusky Salamanders were found under rocks along streams at several sites. They were found most typically in wet seeps.

Eurycea bislineata (Northern Two-lined Salamander) (3, 7)
An adult Two-lined Salamander was found under a log beside the Point Trail. Two adults were found under rocks along a stream bed near the Bear Bottom Loop Trail.

Eurycea longicauda (Long-tailed Salamander) (7)
Long-tailed Salamanders were found under leaf litter, rocks, and logs along streams at Site 7.

Notopthalmus viridescens (Red-spotted Newt) (2)
A red eft was found under a log beside the Wildcat Ledge Trail.

Plethodon cinereus (Red-backed Salamander) (1, 3, 4, 5, 6, 7, 9, 10)
Red-backed Salamanders were found in as many of the different survey sites as any species observed during the survey, and was the most frequently observed salamander, total numbers found exceeding all the other salamander species combined (Table 1). They were found primarily under logs, but also under the bark of fallen logs and under rocks on the forest floor. They were more prevalent in the ravines where moisture was higher. Most specimens' colors were red-backed, but there were a few "lead-backed" color phases found as well.

Plethodon cylindraceus (White-spotted Slimy Salamander) (7)
A Slimy Salamander was found under debris in a junk pile in the woods.

Pseudotriton ruber (Northern Red Salamander) (7)
The only Red Salamander found was an adult under the bark of a log.

Reptiles:
Lizards:

Plestiodon fasciatus (Common Five-lined Skink) (2, 3, 5, 7, 9, 10)
Five-lined Skinks were found at many sites in the Park. Many were on fallen logs and wood piles; one was under a roll of garden fabric.

Plestiodon laticeps (Broad-headed Skink) (2, 10)
Broad-headed Skinks were observed on standing trees. To confirm the identity from scale counts, an adult male was photographed with a telephoto lens. Digital Photographs were deposited in the VHS Archive (#239) as a voucher of this new county record. The specimen from site 10 was captured and a scale count made directly from the specimen.

Sceloporus undulatus (Eastern Fence Lizard) (1, 2, 3, 4, 5, 7, 9, 10)
Most Fence Lizards were observed basking on trees, although some were foraging on the forest floor or fallen logs, and then retreated up trees when approached. A juvenile was found with a tick attached to its head.

Turtles:

Chelydra serpentina (Eastern Snapping Turtle) (5)
An adult Snapping Turtle was caught in a hoop trap set in one of the Oxbow ponds beside the Shenandoah River along the Bluebell Trail. A juvenile was found in a small stream along the Trail.

Chrysemys picta (Eastern Painted Turtle) (5, 6, 8, 9)
Painted Turtles were observed at several locations in the Shenandoah River and its Oxbow ponds, both swimming and basking. Two adult females were caught in a hoop trap set in one of the Oxbow ponds along the Shenandoah River. A juvenile was found in the man-made stream of the Visitor's Center.

Pseudemys rubiventris (Northern Red-bellied Cooter) (8, 9)
Red-bellied Cooters were observed basking on logs in the Oxbows along the Shenandoah River, and one was captured in fresh cut grass near Culler's Trail.

Terrapene carolina (Eastern Box Turtle) (1, 3, 4, 5, 7, 9)
Box Turtles were found at several sites foraging on the forest floor. One female had fly larvae on either side of her neck.

Snakes:

Agkistrodon contortrix (Northern Copperhead) (7, 9)
Copperheads were found at two sites during the survey. One was found near the Bear Bottom Trail, basking in a leaf pile beside a log pile. One was under the same rock as a Cornsnake along Culler's Trail. Another was at the base of a rock at the forest edge.

Carphophis amoenus (Eastern Wormsnake) (2, 3, 4, 5, 6, 7, 9, 10)
Worm Snakes were found under logs and rocks, and inside decaying logs on the forest floor. They were observed at 8 of the 10 Sites. This was the most frequently observed snake, both from the standpoint of numbers of individuals observed and the number of sites where the species was found (Table 1).

Coluber constrictor (Northern Black Racer) (9)
Black Racers were observed in a grassy area beside Culler's Trail, on a rocky hillside and a rocky ledge. A juvenile and two adults were seen, one of the adults was nearly ready to shed.

Diadophis punctatus edwardsii (Northern Ring-necked Snake) (2, 7, 9, 10)
Ring-necked Snakes were found under logs, rocks, and the bark of fallen logs on the forest floor. There were four subadults found under the bark of the same log at Site 7.

Lampropeltis triangulum (Eastern Milksnake) (9)
An adult Eastern Milksnake was found under a rock. It had four areas of damage to its body with several old scars.

Nerodia sipedon (Common Watersnake) (5, 7, 8)
Watersnakes were observed at several localities along the Shenandoah and its Oxbow ponds. Juveniles were found coiled under rocks and basking beside streams. Adults were found in a rock pile around a culvert between the campground and the river.

Opheodrys aestivus (Rough Greensnake) (7)
A Rough green snake was found moving on the leaf litter of the forest floor just north of the Bear Bottom Loop Trail.

Pantherophis alleghaniensis (Eastern Ratsnake) (1, 7, 9)
Eastern Ratsnakes were observed at several locations in the Park. A subadult was observed in the hollow of a log. A subadult was caught basking on a branch along the Cottonwood Trail. An adult was observed on a tree branch in the Picnic area of the Campbround.

Pantherophis guttatus (Red Cornsnake) (9)
Cornsnakes were observed near Culler's Trail. One was under the same rock as a copperhead, the other was coiled in a shaded area near the edge of the forest.

Regina septemvittata (Queensnake) (7)
A juvenile Queensnake was found under a rock along a stream at Site 7.

Thamnophis sirtalis (Eastern Gartersnake) (2)
A large adult was captured while it was basking in a grassy area behind a wood pile at a campground.

Discussion

The Shenandoah River State Park VHS survey was one of the most successful if measured by finding the species known to be present in the county. Thirty-one of the forty-one species (73%) known to be in Warren County were observed in the park (VADGIF FWIS Database). This is a high number for a two day survey. This could be in part due to a low number of species found in Warren County. Warren County lacks the high number of anurans found in the southeastern part of Virginia, nor the large number of endemic salamanders found in the southwest. The majority of species documented for the county are those which are widespread and common in Virginia.

Frogs species not found on the survey but were expected, are *Acris crepitans* and *Lithobates sylvaticus* (VADGIF FWIS Database). Wood frogs are fairly sparse in habitats where they are found, so documenting their presence can be harder than other ranids. It was also outside their February/March breeding season (Martoff et al., 1980), therefore aural surveys would not be able to detect the Wood Frog. *Hyla versicolor* was documented only on the basis of their call and were

never seen. The Cricket Frog is not common in north central Virginia. There are few records in Mitchell and Reay (1999) and only one entry in the state database, from very northern Warren County, at the opposite end of the county from our survey. It is likely they are not present in the park.

The species of salamanders we did not document are *Ambystoma jeffersonianum, Desmognathus monticola, Eurycea guttolineata,* and *Gyrinophilus porphyriticus* (VADGIF FWIS Database). The Jefferson Salamander is hard to find, except adults during the breeding season, and larvae during the summer. They were only recently documented for the park and the county (Widmer, 2011). The Seal Salamander is relatively common where found. In Warren County, the VADGIF FWIS database has only five entries, all near or east of Front Royal. This survey was farther south of that part of the county. It is possible, although unlikely, they are not present in the southern part of the county. The Long-tailed and Three-lined Salamanders are rarely sympatric (Carlin, 1997). We found the Long-tailed Salamander, making it unlikely the Three-lined Salamander would be found in the same area. There is in fact only a single record of the Three-lined Salamander for Warren County. It was reported from farther north, just south of Front Royal. It is unlikely the Three-lined Salamander is present in the park. The Spring Salamander is widely spread throughout the mountains of western Virginia. They are more common in the southern and central parts of the state (Mitchell and Reay, 1999). In Warren County, there is only a single record of the Spring Salamander, from farther north near Front Royal. During our survey, many of the temporary streams in the park were dry, making it likely that if Spring Salamanders were present, they were underground. If they are present in the park, they are not common and it would be easy to miss them.

We did document the presence of *Ambystoma opacum*, the Marbled Salamander. A single adult was found under a log along the Wildcat Ledge Trail. There are very few records in Mitchell and Reay (1999) for the northwest part of Virginia. There are a number of records in the Virginia DGIF FWIS database for the west and northern part of Page County, just to the south of Warren. It is likely there is at least a presence in northwest Virginia and additional finds could be sought in surrounding counties.

Only two lizards, the Common Five-lined Skink and the Eastern Fence Lizard were documented for Warren County (Mitchell and Reay, 1999; VADGIF FWIS Database). We found both species and *Plestiodon laticeps*, the Broad-headed Skink as well. Broad-headed Skinks were seen along the Wildcat Ridge Trail where one was photographed with a telephoto lens to get a good scale count for positive identification, and the Shale Barrens Trail where the animal was captured. The Broad-headed Skink is probably not uncommon in the park, but hard to identify because of their similarity to the Common Five-lined Skink and their propensity to escape capture and positive identification by retreating up trees.

There were five turtles documented for Warren County. We found four of these but not *Glyptemys insculpta*, the Wood Turtle. Given the rarity of Wood Turtles in northern Virginia, and their elusive nature, it is not surprising we missed this observation.

There are 12 species of snakes documented for Warren County (VADGIF FWIS database). We found nine of these plus the Queen Snake. A juvenile Queen Snake was found under a rock along a stream near the Bear Bottom Loop Trail and represents a new record for Warren County. Queen Snakes are found scattered throughout northern Virginia with records in several counties surrounding Warren (Mitchell and Reay, 1999), so this find is not unexpected. We did not find *Crotalus horridus, Heterodon platirhinos* or *Lampropeltis getula.* These species have been found in Warren County and probably occur within the Shenandoah River State Park, but like most snakes are not common and can be difficult to locate. An interesting note is that one of the northern copperheads found (site #9) was resting under a rock with a red cornsnake. Although it is known that copperheads den with other snakes such as timber rattlesnakes and rat snakes (Ernst, 1992; Gloyd and Conant, 1990; and Drda, 1968), it is rare to see them sharing refugia outside the hibernacula with other species. As snakes leave the hibernacula, different species may be found close together near the hibernacula, however this may be the first recorded account of a copperhead and a red cornsnake sharing a hiding space.

The Shenandoah River State Park is a beautiful park located in the mountains of northern Virginia. It has lovely forested hills overlooking scenic valleys and crossed by extensive hiking trails. The Visitor's Center has a stream and nice displays which seek to educate the public on the benefits of natural areas. Given that the majority of the County's herpetofauna occurs within the park boundaries, it is also in a unique position to preserve these species, so the public will be able to observe, photograph and enjoy them for decades to come. The new distribution records reported by this survey, plus those recent published in *Catesbeiana* (Widmer et al., 2011; Milner, 2012; and Saik, 2012) indicate that it is likely there are additional species that are left to be documented for Warren County. We encourage others to keep looking and report any new distribution records. The work in Warren County is not yet finished.

Literature Cited

Carlin, J.L. 1997. Genetic and morphological differentiation between *Eurycea longicauda longicauda* and *E. guttolineata* (Caudata: Plethodonditae) Herpetologica 53(2): 206-217.

Drda, W. J. 1968. A Study of Snakes Wintering in a Small Cave. Journal of Herpetology, 1(1):64-70.

Ernst, C. H. 1992. Venomous Reptiles of North America. Smithsonian Institution Press. Washington and London, 236 pp.

Gloyd, HK, and Conant, R. 1990. Snakes of the Agkistrodon Complex: a Monographic Review. Society for the Study of Amphibians and Reptiles, Contributions to Herpetology 6, Saint Louis, MO 614 pp.

Martoff, B.S., W.M. Palmer, J.R. Bailey, J.R. Harrison III, and J. Dermid. 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press. Chapel Hill, NC. 264pp.

Mitchell, J.C. and K.K. Reay. 1999. Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Virginia Department of Game and Inland Fisheries, Richmond, VA 122pp.

Saik, J. 2012. County record for *Carphophis amoenus* for Warren County. *Catesbeiana* 32(2):84.

Widmer, T. et al. 2011. County record for *Ambystoma jeffersonianum* for Warren County. *Catesbeiana* 31(1):40

Acknowledgements:

We thank the Park for inviting this survey and the hospitality exhibited by the staff during our stay. We wish to thank the following volunteers who came out and donated a weekend to this survey: Craig Abbott, Mitch Bowling, Jill Card, Daniel Chandler, Ryan and Scott Collister, Dane Connely, Bill Feeney, Chip Flater, Robert and Rosemary Freeza, Kelly Geer, Jason Gibson, Kyle, Josian and Emma Harris, Colby and Jared Henson, Steven Johnson, Colleen Marzec, Brian and Mitchell Kim, Larry Mendoza, Richard, Geneva and Ashley Okimoto, Vinnse Passano, David and Joanne Perry, Chris Risch, Gene, Katherine and Paul Sattler, Caroline Seitz, James Shelton, Kory, Emily and Elijah Steele, Don Webber, Mike Will, David and Wesley Van Gelder, Sean Wender, John, Charise and Amy White, and Dennis Woodson,

Ambystoma opacum from Shenandoah River State Park

***Hyla cincera* (Green Treefrog),** VA: Craig Co., ca. 2.4 km NE of Simmonsville; open herbaceous habitat near an unnamed stream and small pond (0.05 ha), N side of Cumberland Gap Road (State Highway 42). 25 September 2012. Brian R. Murphy.

County Record: At approximately 1300 h on 25 September 2012 a green treefrog was captured by hand from a mowed lawn, at an elevation of 705 m. Weather conditions were cool and clear, with no rain for almost a week. Voucher photographs were taken for deposit in the VHS archives (#240), and the animal was released. On 25 August 2012, multiple calls resembling green treefrog were noted at two locations within 200 m of the capture site, but positive identification was not obtained (Scott Klopfer).

The green treefrog is found throughout Virginia's Coastal Plain from the Delmarva Peninsula south (Mitchell, J.C. and K.K. Reay. 1999. Atlas of Amphibians and Reptiles in Virginia. Special Publication No. 1, Virginia Department of Game and Inland Fisheries, Richmond, Virginia. 122 pp). This is the first confirmed record from Craig Co., although this section of the county is within the New River watershed where the only other confirmed report for this species from southwestern Virginia occurred (Pulaski Co. 7/7/2010; Virginia Fish and Wildlife Information Service).

We believe this observation is most likely a result of introduction from nursery plant stock or construction materials. While some natural range expansion of this species has been reported in North Carolina and Virginia, this site is over 180 km from the closest reported population in Prince Edward Co. (Virginia Fish and Wildlife Information Service 2012). We suggest the greater significance of this observation is the discovery of a potentially persistent population of *H. cinerea* in a region greatly disconnected from its historic range, especially within the context of changing climatic conditions. Surveys for the presence of a breeding population will be conducted in the collection area during 2013.

Brian R. Murphy
Department of Fish and Wildlife Conservation
Virginia Tech
Blacksburg, VA 24061

Scott Klopfer
Conservation Management Institute
College of Nat. Res. and Environment
Virginia Tech
Blacksburg, VA 24061

***Pantherophis alleghaniensis* (Eastern Ratsnake),** VA: Craig Co., ca. 2.67 km NNE of Simmonsville; rocky timbered hillside, N side of Cumberland Gap Road (State Highway 42). 12 January 2013. Brian R. Murphy.

Early Emergence: The eastern ratsnake is common throughout Virginia (Mitchell, J.C. and K.K. Reay. 1999. Atlas of Amphibians and Reptiles in Virginia. Special Publication No. 1, Virginia Department of Game and Inland Fisheries, Richmond, Virginia. 122 pp.), and has been recorded from Craig County. VDGIF reports typical emergence of this species in VA as occurring in April (http://www.dgif.virginia.gov/wildlife/information/?s=030023). Similarly, emergence from hibernacula was reported during April-June in Maryland and Ontario (Blouin-Demers, G., K.A. Prior, and P.J. Weatherhead. 2000. Patterns of variation in spring emergence by black rat snakes (*Elaphe obsoleta obsoleta*). Herpetologica 56: 175-188). Here, I report a record of unusually early emergence from hibernation by an eastern ratsnake in Craig County.

At approximately 1300 h on 12 January 2013 an adult eastern ratsnake (SVL 136.8 cm, total length 161.6 cm, 865 g; VHS Archive #253) was captured by hand from a rocky timbered hillside in mixed oak-hickory forest, at an elevation of 735 m on a SE aspect slope. The snake was active and defensive. Weather conditions at the time of collection were partly cloudy and unseasonably warm (air temperature 18.3º C), but temperatures during the preceding days were not unseasonal. A private weather station 685 m from the collection site recorded daily low and high temperatures for the preceding 3 days as -1 to 5º C and 3 to 8º C, respectively (preceding 7 days: -8 to -1º C, and -2 to 8º C). There was partial snow cover in the immediate area of the collection site through 9 January 2013. A potential hibernaculum in the roots of a red maple *Acer rubrum* was located within 10 m of the collection site (38 cm deep; a S-facing entry hole 14.6 cm x 9.2 cm, 15 cm above the ground). January emergence has been previously reported in the mid-Atlantic region (Stickel, L. F., W. H. Stickel, and F. C. Schmid. 1980. Ecology of a Maryland population of black rat snakes (*Elaphe o. obsoleta*). American Midland Naturalist 103: 1-14). Blouin-Demers et al. (op. cit) postulated that microclimate at hibernacula controls specific dates of emergence. Based on the present record, an extended period of warm weather is not necessary to stimulate the eastern ratsnake to emerge from hibernation during winter, at least temporarily. The observed emergence would likely have been of short duration, as 10.5 cm of snow and temperatures as low as -5º C occurred less than one week after this observation.

Brian R. Murphy
Department of Fish and Wildlife Conservation
Virginia Tech
Blacksburg, VA 24061

***Sternotherus odoratus* (Eastern Musk Turtle)**. VA: Franklin Co., Ferrum, Ferrum College Campus. Chapman Pond (36º, 55′ 32″ N, 80º 01′ 40″). Elevation 1346′ (410 m). 21 September, 2012. Todd Fredericksen, Michael Drews, Anthony Garcia, Abigail Lewis, Tyler Muckle.

County Record: On 21 September 2012 at 1530 h, an Eastern Musk Turtle (*Sternotherus odoratus*) was captured as part of an aquatic turtle population study at Ferrum College. The capture occurred along the eastern shoreline in a funnel trap located in the water at a depth of 0.5 m. The trap was baited with sardines. Carapace length was 107 mm and plastron length was 80 mm. Sex of the individual was not determined. A photograph of the turtle was deposited in the VHS Archive (#236).

Todd Fredericksen
212 Garber Hall
Ferrum College
Ferrum VA 24088

***Lampropeltis calligaster rhombomaculata* (Mole Kingsnake)**. VA: Cumberland Co., 4 km ENE Duncan's Store on County Route 600, (37.33356 N, 78.31638 W, NAD 844). 31 August 2012. Wendy H. Robertson.

County Record: On 31 August 2012, W.H. Robertson observed a DOR Mole Kingsnake east of Duncan's Store on Co. Rt. 600 in the northern part of the county. Mitchell (1994. The Reptiles of Virginia. Smithsonian Inst. Press, Washington, DC 352 pp.) listed an unvouchered record for this species in the county and Mitchell and Reay (1999. Atlas of Amphibians and Reptiles in Virginia. Spec. Publ. 1, Virginia Dept. Game and Inland Fisheries, Richmond, VA 122 pp.) included a different unvouchered record on the county line between Cumberland and Powhatan counties. The juvenile Mole Kingsnake was dried and unsalvageable but a digital photograph deposited in the VHS archives (# 251) verifies its occurrence in Cumberland County. I thank Wendy Robertson for sharing this observation.

Joseph C. Mitchell
P.O. Box 2520
High Springs, Florida 32655-2520

***Lampropeltis getula* (Eastern Kingsnake) and *Chelydra serpentina* (Snapping Turtle)**. VA: Charles City Co. 12.5 km WSW Charles City (37.326994 N, 77.206308 W, NAD 84). 25 May 2012. Peter D. Smallwood.

Oophagy: Eastern Kingsnakes are well known for consuming a wide variety of prey, including mammals, birds, snakes, lizards, small turtles, frogs and salamanders (Mitchell. 1994. The Reptiles of Virginia. Smithsonian Inst. Press, Washington, DC 352 pp.; Ernst and Ernst. 2003. Snakes of the United States and Canada. Johns Hopkins Univ. Press, Baltimore, MD), as well as *Coluber constrictor* eggs (Green and Cobb 2011. Herpetol. Rev. 42:615). Winne et al. (2007. Copeia 2007:507-519) documented several cases of *L. getula* predation on the eggs of five turtle species in South Carolina, including *C. serpentina*. Palmer and Braswell (1995. Reptiles of North Carolina. Univ. North Carolina Press, Chapel Hill, NC 412 pp.) added *Malaclemys terrapin* eggs. On 25 May 2012, one of us (PDS) observed the posterior third of an Eastern Kingsnake with its head and remainder of its body underground adjacent to a stump in a maintained lawn between the parking lot and a stand of trees in the Inger and Walter Rice Center for Environmental Life Sciences, Charles City County, Virginia. Removal of the snake revealed a *C. serpentina* egg in its mouth (VHS Archive #248). She had already consumed several eggs when found; they had been swallowed whole. One egg was palped in its anterior stomach but the remainder the body was enlarged and firm without palpable eggs. The snake continued to swallow the egg despite being removed from the nest and held; it was subsequently released. Our observation provides the first documentation of *C. serpentina* eggs in the diet of *L. getula* in Virginia. This is VCU Rice Center Research Contribution No. 31.

Figure 1. Adult *Lampropeltis getula* consuming a *Chelydra serpentina* egg in Charles City County, Virginia. Photo by Deanna Dong.

Joseph C. Mitchell
P.O. Box 2520,
High Springs, Florida 32655-2520

Peter D. Smallwood
Department of Biology
University of Richmond,
Richmond, Virginia 23173

***Hyla gratiosa* (Barking Treefrog)**. VA: Greensville Co., off Co. Rt. 671, ca. 3 km N of Purdy. 26 November 2010. M. T. Jones; Co. Rt. 608, ca. 2 km W of Jarratt, 2 June 2012. S. M. Roble. (exact coordinates of sites not disclosed due to state-listed status)

County Record: The Barking Treefrog is a state threatened species in Virginia that has been recorded from approximately 15 sites in the southeastern portion of the state, about half of which are in Surry County. Some of the historically documented sites no longer support populations of this species. Tobey (1985. Virginia's Amphibians and Reptiles: A Distributional Survey. Virginia Herpetological Survey, Purcellville, VA. 114 pp.) was aware of records of Barking Treefrogs from only Chesterfield, Surry, and Sussex counties. Pague and Young (1991. Barking Treefrog species account [pp. 425-426] in K. Terwilliger [coordinator]. Virginia's Endangered Species. McDonald and Woodward Publishing Company, Blacksburg, VA. 672 pp.) listed *Hyla gratiosa* for Chesterfield, Isle of Wight, Mathews, and Surry counties and also noted the existence of unsubstantiated reports from Greensville, Southampton, and Sussex counties. Mitchell & Reay (1999. Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Wildlife Diversity Division, Virginia Department of Game and Inland Fisheries, Richmond, VA. 122 pp.) plotted records for the same four counties cited by Pague and Young (op. cit.). Hoffman and Mitchell (1996. Records of anurans from Greensville County, Virginia. Banisteria 8: 29-36) recorded 17 species of frogs and toads from Greensville County but did not mention *H. gratiosa* in their paper. Roble et al. (2005. Opportunistic surveys for the oak toad (*Bufo quercicus*) in southeastern Virginia: On the trail of Leslie Burger. Catesbeiana 25: 3-23) published the detailed notes of the late Leslie Burger regarding a now extirpated population of *H. gratiosa* that he discovered in 1959 near Littleton in Sussex County (the breeding site was ditched and tiled a year later). A breeding population of *H. gratiosa* was documented in eastern Southampton County in July 2002 by Shelly Miller and Dean Walton during a North American Amphibian Monitoring Program roadside survey (pers. comm. to SMR). There are also two unpublished records from the Grafton Ponds Natural Area Preserve in York County from 1990, but Barking Treefrogs have not been found there subsequently (Virginia Department of Conservation and Recreation, Division of Natural Heritage Biotics database). Within the past decade, *H. gratiosa* has been reported from three additional political jurisdictions in Virginia: City of Virginia Beach (Kleopfer, J. D. and A. C. Chazal. 2006. Field notes. Catesbeiana 26: 70), Nottoway County (Kleopfer, J. D. and P. J. Semtner. 2007. Field notes. Catesbeiana 27: 98-99), and Prince George County (Niccoli, J. R. 2012. Field notes. Catesbeiana 32: 84-85; Blem, C. R. and M. A. Miller. [1980. The Barking Treefrog. Virginia Wildlife 41: 16-17] previously mentioned its occurrence in this county but did not cite specific localities). The Nottoway County population is probably the result of an accidental introduction (Kleopfer and Semtner, op. cit.). Greensville County is added to the known distribution of *H. gratiosa* in the state on the basis of the following recent records, both of which are along the Fall Line separating the Piedmont and Coastal Plain physiographic provinces.

On 26 November 2010, M. T. Jones unearthed an adult male Barking Treefrog while disking a small field (0.1 acre food plot) surrounded by loblolly pine plantations on his property near Purdy, Virginia. The frog was presumably hibernating underground in the sandy soil at the time and

was not injured by the disking operation. It was photographed and released. The pine plantations in the immediate vicinity of the capture site had been prescribed burned in 2009. S. M. Roble subsequently visited the site on 13 June 2012 but did not observe or hear any Barking Treefrogs, nor did he find evidence of tadpoles of this species at a potential breeding site near the Nottoway River. This record represents a westward range extension for Barking Treefrogs in Virginia of about 39 km (24 mi) from Littleton and is approximately 56 km (35 mi) west of the Southampton County site mentioned above.

On the night of 2 June 2012, Roble heard Cope's Gray Treefrogs (*Hyla chrysoscelis*), Pine Woods Treefrogs (*Hyla femoralis*), and Squirrel Treefrogs (*Hyla squirella*) chorusing vigorously in a flooded field along Co. Rt. 608 near the town of Jarratt. Several American Bullfrogs (*Lithobates catesbeianus*) and one Barking Treefrog were calling in the distance, at least 150 meters from the road. Subsequent examination of aerial photographs revealed the presence of the probable breeding pond at that site. No frogs were calling in this same area eleven nights later. The presumed Barking Treefrog breeding pond is approximately 9 km southeast of the observation near Purdy in the same county. A review of aerial photographs reveals the presence of numerous natural ponds (mostly surrounded by pine plantations) in northern Greensville County and nearby areas of Sussex County that may provide breeding habitat for Barking Treefrogs, suggesting that more surveys for this species are warranted in this region.

A digital photo (VHS #254) of the Barking Treefrog found near Purdy has been deposited in the VHS digital archives.

Steven M. Roble
Virginia Department of
Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219

Mike T. Jones
11254 Purdy Road
Jarratt, Virginia 23867

***Heterodon platirhinos* (Eastern Hog-nosed Snake)**. VA: Cumberland Co., 12.4 km NE Cumberland, (37.55647 N, 78.12666 W, NAD 844). 31 August 2012. Wendy H. Robertson.

County Record: On 31 August 2012 W.H. Robertson found a DOR Eastern Hog-nosed Snake on Co. Rt. 600 about 12 km northeast of Cumberland. It was a recent hatchling (170 mm SVL) with a visible umbilical scar. The SVL of this hatchling is slightly smaller but comparable to two individuals (185-190 mm SVL) found on Assateague Island, Virginia (Scott 1986. Brimleyana 12:51-55). This is the first documented record for this snake in Cumberland County (Mitchell 1994. The Reptiles of Virginia. Smithsonian Inst. Press, Washington, DC 352 pp.; Mitchell and Reay 1999. Atlas of Amphibians and Reptiles in Virginia. Spec. Publ. 1, Virginia Dept. Game and Inland Fisheries, Richmond, VA 122 pp.). A digital photograph has been deposited in the VHS archives (#251).

Joseph C. Mitchell
P.O. Box 2520
High Springs, Florida 32655

President's Corner

Greetings, my fellow herp lovers! Looks like this year's going to be another exciting year for the Virginia Herpetological Society! I would like to start off by thanking everyone for your continued support. As many of you may already know, the VHS is THE authority on all herpetological related information in Virginia. Many people rely on us for information on Virginia herps. This is evidenced by the many emails and interview requests for news articles and magazine articles we receive every year. We even received a radio show live interview request last year. The VHS is made up of wonderful people who volunteer their time, supplies and money to ensure that each survey, business meeting and other VHS activities continue to be a success. It is only because of the dedicated support of our volunteers that we can continue to move forward and make the VHS the best it can be. All of us who are members of the VHS support the mission of the VHS, which is to support research, conservation and education of our native herpetofauna.

I wanted to take this opportunity to introduce everyone to our Executive Committee who has worked tirelessly for the last two years and to thank him or her personally for all the hard work. Everyone on the Ex. Com. has provided me with much needed guidance, support and insight. Our Vice President David Perry has been a wonderful and enthusiastic resource. He has been very helpful in organizing our surveys and backing me up whenever I needed it. Emily Steele, our Treasurer/Secretary has been diligently working hard these past few years in keeping the VHS in order. She has been helping in providing logistical support during surveys, helping me create meeting agendas and minutes and keeping our finances in order. Essentially the VHS could not function without Emily's help. Paul Sattler is our *Catesbeiana* editor and long time VHS member. Paul has been integral in making sure that our journal is peer reviewed and full of good scientific information for everyone to learn from and enjoy. He has also been very helpful in answering many questions that we receive from the public. Susan Watson is our newsletter editor. I believe the quality of our newsletter speaks for itself. I also want to thank Susan for helping us get our collection permits year after year. Kory Steele, our past-president, has been helpful in almost every aspect of the VHS and without his guidance I wouldn't have known where to even begin. Kory continues to be a very strong voice in the VHS. He helps with surveys, herp ID's, IT issues and a number of other logistical issues. John White is our webmaster extraordinaire and one of our many herp experts. John was the recipient of the VHS lifetime achievement award last year. This is an honor that is not given away lightly and I truly thank John for not only making our website full of wonderful information and images, but to also help moderate our online presence including our Facebook page. Mike Clifford, another long time member, has been the Chair of our Educational Committee. Mike compiles data regarding our educational efforts that we all engage in throughout the year and he himself is heavily involved in making power points and other educational programs for children and adults alike. I want to especially thank Mike for donating to the VHS a number of GPS units. These GPS units will come in very handy during our surveys and will ensure we collect more precise data. Jason Gibson is a long time member of the VHS and has been organizing our yearly "Herp Blitz". Jason is very knowledgeable and wise when it comes to all things VHS. I've often relied on his knowledge and expertise. Jason has made many positive contributions to the VHS and has been a very sound and wise voice in the Ex. Com. Patricia (Pattie) Crane runs our online shop. She's constantly looking for new designs to put on our t-shirts, mugs and even iPad cases along with all of our other wonderful merchandise. If you haven't checked out our store yet, you should.

I also would like to thank our Advisory Committee for providing much guidance and help in leading the VHS in a positive direction: John Orr, Kelly Geer, Caroline Seitz, and last but certainly not least Rachel Goodman. Each one of them contributes regularly in leading surveys, helping to

write entries for Catesbeiana and bringing knowledge and expertise to our leadership.

I would like to welcome our newest member, Michael Meyer as our new Chair for the Research Committee. I will be working with Michael to ensure our grant requests continue to get proper review. Michael will be part of a research grant review team that will make recommendations to the rest of the Ex. Com.

Finally, but probably most importantly, I would like to thank all of you. At the foundation it is our membership that keeps this wonderful organization moving forward. Thank you for your continued support. I have met many of you during our surveys and fall meetings and I am delighted to have many of you as friends and colleagues.

SURVEYS

As always, this year's surveys will not disappoint. For more details, please visit our website.

Annual Spring Survey and Business Meeting. This year we have decided to move to southeast Virginia and conduct our spring survey at Back Bay National Wildlife Refuge and False Cape State Park. The survey will be conducted on the weekend of May 3-5.

The VHS will be partnering with the James River Master Naturalists to conduct a BioBlitz at the Francis/Emma/Belmead site in Powhatan County. This survey will be conducted May 18 and 19.

Our yearly Herp Blitz will be held at the Dick Cross (Elm Hill) Wildlife Management Area in Baskerville, Va. This two-day survey will occur on June 8th and June 9th.

I'm certain that this will be a fun and exciting year for the Virginia Herpetological Society. Please do not hesitate to contact me for any questions or comments at president@vaherpsociety.com

Regards,

Larry Mendoza, President
Virginia Herpetological Society

Minutes of the Fall 2012 VHS Meeting

Virginia Herpetological Society
Minutes of the Fall Meeting
Smithsonian National Zoological Park
Washington, DC 20008
October 20, 2012

The meeting was called to order at 1:37pm by the president, Larry Mendoza, with 13 in attendance. The agenda was provided to all attending.

The following old business was reviewed: Submission for the state reptile as the eastern ratsnake and the state amphibian as the spotted salamander was sent to Senator Black. The research and conservation committees are still in need of chair appointments. Snake Force One, a division of the research committee, is no longer active. The data collected in the field will be compiled. The duties of each committee will be expanded. Activity with the National Herpetological Society has waned as suggested at the last meeting. It is agreed to remove our name from the active membership list.

Committee Reports
Newsletter, Susan Watson: Unable to attend, report not made available.

Catesbeiana, Paul Sattler: 32(2)- 275 copies were printed at the cost of $408. 255 copies were mailed at the cost of $264. Should have Shenandoah River State Park, Pocahontas State Park, and Breaks Interstate Park available for publication in the next journal.

Past President, Kory Steele: Following up on grant recipients and their obligations to fulfil their agreement.

Education, Mike Clifford: Unable to attend, report made available online.

HerpBlitz, Jason Gibson: Possible upcoming survey idea, hellbender survey. Possible upcoming survey locations, Carol County, southwest region of the state.

Cafepress, Patricia Crane: Unable to attend and report made available and was reviewed. 2013 calendar is available for purchase. Will change photo submissions cut-off from Sept. 1 to Oct. 1 next year to allow extra time for more diverse photo submissions. Annual fee is no longer a flat fee, but a percentage of sales. This will decrease our cost to run the store.

Treasurer-Secretary, Emily Steele: 256 members, 1280 Facebook fans. Current bank account balance $8244.45.

Website, John White: Site is currently undergoing reorganization.

Advisory, Craig Pelke, John Orr, Rachel Goodman, Caroline Seitz, Kelly Geer: No report provided.

New business

1. Voted and approved unanimously to amend the constitution. Will cancel memberships in March instead of June. Will still provide adequate notice before removing names from membership list.
2. Catesbeiana and newsletter, pdf vs paper? Voted on allowing members to opt in for paper copy of Catesbeiana. Pdf will be default, but all members will be provided the option for a paper copy. Printing the newsletters and mailing to members vs pdf only will be discussed at the spring meeting.
3. Membership categories: Voted on and approved changing categories from youth, regular, family, and life **to** student, regular, and life. Will remove the family membership as an option. Increasing membership fees will be tabled until the next fall meeting.
4. VHS role in the "Dangerous Animal Initiative" legislation. Larry and David are attending meetings.
5. Create budget to encourage us to spend wisely and allocate amounts for purchasing items such as turtle traps, presentation tent, animal models, gps units, and other necessary supplies.
6. Suggestions for spring meeting and survey. Need to review the map on our website to see where surveys are lacking. Suggestions of coastal plain and Lake Anna were made.
7. October 2013 is our next election of officers. Nominating committee, Jason Gibson, will start the process to provide adequate time for considerations.
8. Open discussion raised the idea of potential joint meetings and surveys with the Tennessee and North Carolina herp societies.

Meeting was adjourned at 3:10pm.

Emily Steele
VHS Treasurer-Secretary

Treasurer's Report

Treasurer's Report by Emily Steele

Balance on hand 09/27/2012	**$8,056.58**	
Receipts		
New memberships		$1,121.00
Renewed memberships		$2,078.00
Donation from Anthony Leonardo		$200.00
Donation from Friends of Dyke Marsh, for presentation by Caroline Seitz		$100.00
Donation from Dale Brittle		$30.00
Donation from Elizbeth Elkovich		$40.00
Donation from Sonja, Bill, and Joe Hedstrom for Reptile Weekend		$10.00
Cafe Press Commission		$88.28
Total receipts:	$3,667.28	
Disbursements		
PayPal transaction fees		$112.69
Catesbeiana 32(2), printing and postage		$672.24
Fall Meeting, keynote speaker		$200.00
Fall Meeting, awards and plaques		$196.28
State Corporation Commission annual fee		$26.00
Exhibitor's permit fee		$20.00
Office supplies		$87.10
Total disbursements:	$1,314.31	
Balance on hand 04/21/2013	**$10,409.55**	
Total Society members:	202	
Total Facebook fans:	1,508	

2013 VHS Spring Survey and Meeting

The VHS will hold its Annual Spring Meeting and Survey May 3-5 at Back Bay National Wildlife Refuge and a portion of False Cape State Park, in Virginia Beach. Public vehicle access is not allowed beyond the visitor center at Back Bay NWR nor in any part of False Cape State Park. The VHS will rely on Park personnel to provide transport to and from several of the survey zones. The VHS will have access to certain impoundment areas not open to the public. Several species not frequently encountered have been sighted within these parks, including rainbow snakes, glass lizards and chicken turtles. Also, eastern cottonmouths are frequently encountered within the refuge, so snake boots/knee high rubber boots are strongly recommended for all survey participants.

Location: Back Bay National Wildlife Refuge
Dates: May 3-5
Schedule:
Friday May 3rd: The Business meeting will be held at the Ashville Bridge Creek Environmental Education Center located at 3022 New Bridge Road (near the intersection with Sandbridge Road). This is a Back Bay NWR facility. There is a small brown sign at the driveway that contains the name of the facility and a larger brown Maitenance-Authorized Vehicles sign. The building (house) is not visible from the road. Attendees should drive in and park behind the house. Occupancy is limited to 30 people. We will have access from 6:30-8:30 pm. Water and soft drinks will be provided.

Saturday May 4th – Sunday May 5th: On Saturday and Sunday the VHS will meet at the Visitor's Center of Back Bay NWR at 4005 Sandpiper Road. Scheduled departure time is 8:30 am for both days. Most of the survey groups will need to be transported by government vehicles. Two exceptions are the potential canoe/kayak team, who can launch from the Visitor's Center, and the survey group covering the area closest to the Visitor's Center. Back Bay will provide 3 vehicles capable of transporting about 20 people to 2 or 3 survey sites. False Cape will provide a school bus capable of transporting up to 35 people with gear to 3 or more survey sites. False Cape has a second 24 person vehicle they will make available.

Parking: Parking is free for the survey provided a VHS Parking Pass is visible on entry and placed on the dashboard of parked vehicles (see the VHS web site to print off this pass). Make sure your pass is properly displayed as towing is strictly enforced.

Accommodations: There are camping and motels in the area. See the VHS web site for a list of available accommodations.

Can't make this survey? Visit the VHS web page and click on the link to "Events" and look for a survey close to you!

Field Notes

The field notes section of *Catesbeiana* provides a means for publishing natural history information on Virginia's amphibians and reptiles that does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior, and other topics are welcomed. Field Notes will usually concern a single species. The format of the reports is: scientific name (followed by common name in parentheses), state abbreviation (VA), county and location, date(s) of observation, observer(s), data and observations. The name(s) and address(es) of the author(s) should appear one line below the report. Consult the editor if your information does not readily fit this format. **All field notes must include a brief statement explaining the significance of the record** (e.g., new county record) **or observation** (e.g., unusual or rarely observed behavior, extremely early or late seasonal record, abnormal coloration, etc.). Submissions that fail to include this information are subject to rejection. Relevant literature should be cited in the body of the text (see Field Notes in this issue for proper format). All submissions will be reviewed by the editor (and one other person if deemed necessary) and revised as needed pending consultation with the author(s).

If the field note contains information on a **new county (or state) record**, **verification is required in the form of a voucher specimen** deposited in a permanent museum (e.g., Virginia Museum of Natural History) or a **photograph** (print, slide, or digital image) **or recording** (digital recording of anuran calls) deposited in the archives of the Virginia Herpetological Society. Photographs and recordings should be sent to the editor for verification and archiving purposes; the identity of voucher specimens must be confirmed by a museum curator or other qualified person. Include the specimen number if it has been catalogued. Prospective authors of distribution reports should consult the VHS website (County/City Herp Lists) to determine if they may have a new county record. New distribution records from large cities that formerly constituted counties (Chesapeake, Hampton, Newport News, Suffolk, and Virginia Beach) are acceptable, but records from smaller cities located within the boundaries of an adjoining county will only be published if the species has not been recorded from that county. Species identification for observational records (e.g., behavior) should be verified by a second person whenever possible.

PHOTOGRAPHS

High contrast photographs (digital images) of amphibians and reptiles will be considered for publication if they are of good quality and are relevant to an accompanying article or field note. Published photographs will be deposited in the Virginia Herpetological Society archives.