Amphibian and Reptile Survey of Westmoreland State Park

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Introduction

The VHS annual spring meeting and survey was held at Westmoreland State Park on May 8-10, 2015. Westmoreland to our knowledge has never been surveyed so it presented an ideal place for the VHS to conduct a survey. The park is located in Westmoreland County and is bordered to the north by the Potomac River and all sides of the park are surrounded by private land holdings. Westmoreland State Park is one of the six original state parks formed in Virginia. It opened its doors to the public in 1936. Many of the trails and other features of the park were constructed by the CCC in the early 1930's. The park comprises 530 hectares and has many well maintained trails and many kilometers of beach along the Potomac River. There is a diversity of habitats from brackish marshes, freshwater wetlands, streams, ponds, and mature hardwood/mixed hardwood forests. This park lies within the coastal plain physiographic province. The rise and fall of sea level over millions of years deposited many layers of fossil containing layers of sediments. Visitors can enjoy collecting fossils along the several kilometers of beach where the Potomac River has carved into these fossil-containing sediments.

Study Sites

Westmoreland State Park was divided into 10 distinct survey areas. The characteristics for each area and a GPS (Google Earth) reading at a central point in the area are presented below. Figure 1 is a map of the state park showing the 10 survey areas.

Site 1 (38°10'13.92"N, 76°52'41.78"W)
This site has a mixture of wetland ponds and upland mixed hardwood forest. Steep banks at the edge of the wetlands area transitions into an upland mixed hardwood forest with species such as Chestnut Oak, Red Maple, American Holly, and Mountain Laurel. Many downed trees were observed everywhere in this site due to the effects of hurricane Irene in 2011.

Site 2 (38° 09'57.23"N, 76°52'30.21"W)
This site included Rock Spring Pond Road, Rock Spring Pond and the surrounding forest. The forest is mostly upland hardwood; dominant canopy species include the Tulip Popular and American Sweetgum. Laurel was the dominant plant in the understory. An intermittent stream followed the road and ran into Rock Spring Pond. *Sphagnum sp*. moss covered a large area where the stream met the pond.

Site 3 (38°10'2.78"N, 76°51'42.52"W)
Site 3 included the Beach Trail, beach rip rap habitat, the edge of a cliff and an upland mixed hardwood forest. The dominant species of tree included American Sweetgum, American Holly, American Beech, and Pines. As in other sites there were many downed logs. This site also had a lot of edge habitat and buildings.

Site 4 (38° 09’51.89”N, 76°51’31.26”W)
This site followed Big Meadow Trail. The trail follows a ridgeline with steep banks on either side of the trail. The north side of this site follows a steep bank away from the trail and merges with the Potomac River. The forest consists of hardwoods including American Beech, Paw Paw, and many Oak species. The south side of this site included a marshy habitat which created a margin around a meandering creek. There are many wet areas and springs on the south side of this site. At the most eastern side of this site is a boardwalk crossing through a tidal marsh.

Site 5 (38° 09’37.89”N, 76°51’22.68”W)
Several trails cross through this site. Turkey Neck Trail is hilly and has a hardwood forest with many downed trees. The forest surrounding this trail also has Mountain Laurel thickets and lots of American Holly. The eastern section of this site included the end of Turkey Neck Trail and a small section of Beaver Dam Trail. Several features occur on this portion of the site including an upland mixed hardwood forest with many downed trees and a swampy, marshy area which turns into a stream.

Site 6 (38° 09’35.71”N, 76°51’38.88”W)
Site 6 has several interesting features including a marshy area, a mixed hardwood forest, and many cliffs and ravines.

Site 7 (38° 09’27.84”N, 76°51’52.78”W)
One part of this site was a timbered area with new-growth forest. Traversing this area were old logging roads. In one section there is a wood processing area with many wood piles and scrap logs. A second section of this site has a steep ravine with many springs forming a perennial stream. Surrounding the stream is a mature hardwood forest with American Beech, Tulip Popular, Ironwood and an herbaceous layer of Lizard’s Tail, Japanese Stilt Grass, Sensitive Fern and other fern species.

Site 8 (38° 09’6.15”N, 76°51’16.59”W)
The northwestern section of this site was a swamp surrounded by a mixed hardwood forest. Many trees had been downed by beaver activity. The northeastern section is an expansive wetlands with lots of beaver activity. The center of this site is an upland mixed hardwood forest bounded by a wheat field. The southwest corner has a small stream at the base of steep ravines.

Site 9 (38° 09’27.31”N, 76°52’29.90”W)
The western section of this site is an open field with debris from past timbering. Scattered around is some metal debris. A mixed hardwood forest surrounds the field. The eastern section of this site was a steep ravine with a mixed hardwood forest.

Site 10 (38° 09’42.74”N, 76°52’24.46”W)
There is a diversity of habitats on this site. Rock Spring Pond is a major feature. North of the pond is a wetland meadow with a meandering stream. The soil in this wetland is very spongy with lots of *Sphagnum sp*. moss. Surrounding the pond is a mixed hardwood forest. Another section of this site has a power line right of way and a maintenance area. Around this area is a lot of stone, wood, and plastic debris.

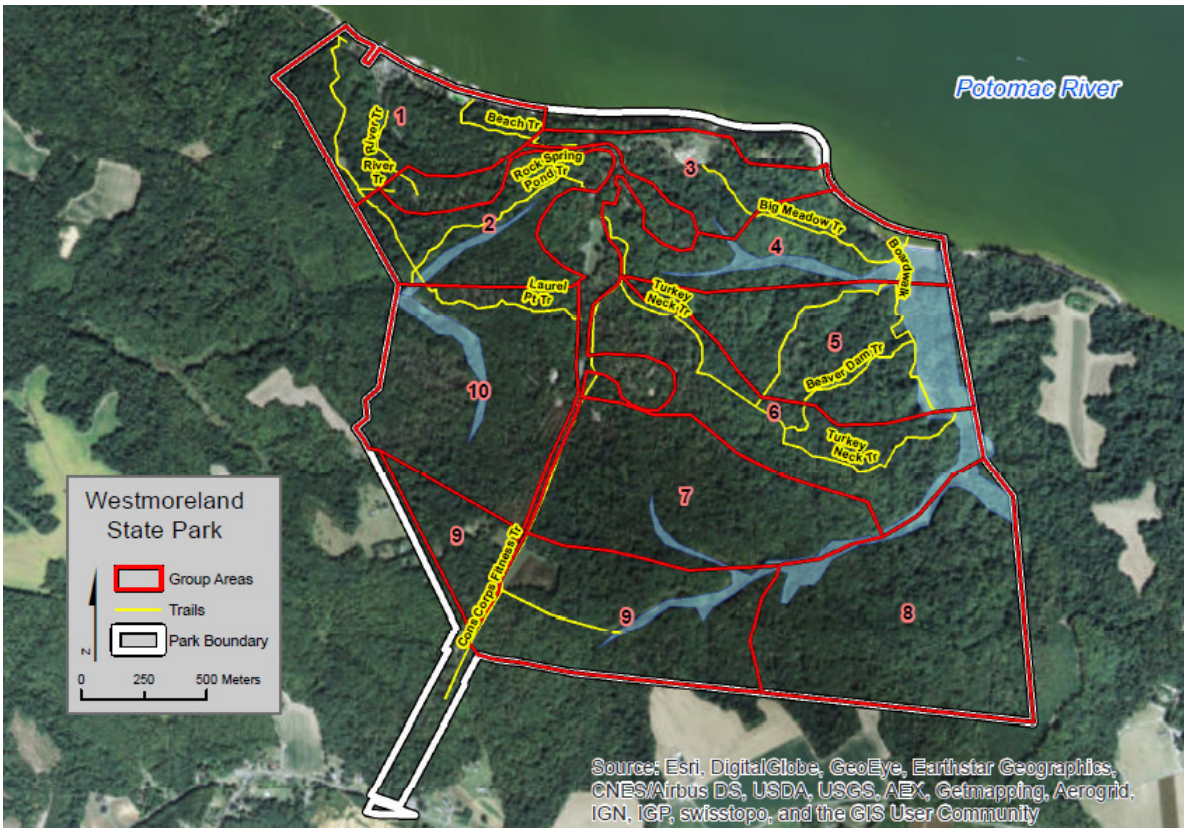

Figure 1. Map showing survey 10 surveys areas.

Materials and Methods

On Friday 8 May 2015 several survey participants placed hoop turtle traps, baited with sardines, at two locations. Two turtle traps were set in Rock Spring Pond and one turtle trap was put in the tidal marsh at site 4. Leading up to the survey Kory Steele divided the state park property into 10 distinct areas. On Saturday 9 May, survey participants were divided into 8 groups. On Sunday survey participants were divided into 2 groups. Once at survey sites, methods used to find animals included hand capture, visual observation, listening for calling males, flipping over cover objects, and dipnetting. Rare animals and animals with signs of disease or injury were photographed. Group leaders filled out survey data sheets to record all animals encountered. Survey data sheets include information on the physical environment, weather, animal health, and microhabitat. Other data collected included morphometric measurements of rare species, age, and sex.

Table 1: The amount of survey effort per research site.

	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**	**Site 7**	**Site 8**	**Site 9**	**Site 10 (Sat)**	**Site 10 (Sun)**
Number of surveyors	11	11	9	9	6	9	13	7	9	5	10
Hours surveyed	3.5	2.5	5.5	5.5	5.5	5.5	2.3	5.5	5.5	5.5	3.5
Person hours of survey effort	38.5	27.5	49.5	49.5	33	49.5	29.9	38.5	49.5	27.5	35

Results

The survey yielded a total of 33 species (10 anurans, 4 salamanders, 5 turtles, 4 lizards, and 10 snake species). A total of 550 animals were either seen or hand captured during the survey weekend. The most commonly collected amphibian was *Acris crepitans* and the most frequently found reptile was *Carphophis amoenus amoenus*. One Eastern Red Salamander was found missing an eye. This was probably due to an injury not a malformation. A few *Anaxyrus americanus* and *Lithobates palustris* were found parasitized by chigger larvae, and *Plestiodon fasciatus* and *Sceloporus undulatus* were found with tick parasites. There were no new county records reported for the survey.

Table 2. Summary of the number of animals observed at each site.

Sites	1	2	3	4	5	6	7	8	9	10	10*	Total
Species												
Amphibians												
Acris creptians	20		1		3	1	10	4		6	10	55
Anaxyrus americanus	1	2	1	1	2		12	5	11	5	4	44
Anaxyrus fowleri	3			1	5	5		6				20
Hyla chrysoscelis	4	2	3	1	3	3	3	6	1	1	1	28
Hyla cinerea	2							1		1		4
Lithobates catesbeianus								1			1	2
Lithobates clamitans	23			1	3	4		5		5	2	43
Lithobates palustris		4					3	2		5	3	17
Lithobates sphenocephalus	1											1
Pseudacris crucifer		1	1	1		1						4
Ambystoma maculatum	1L				1							2
Notophathalumus viridescens v.		1					1		1			3
Plethodon cinereus	1		17	2				2				22
Pseudotrition ruber										1		1

Reptiles												
Chelydra serpentina				1						2		3
Chrysemys picta p.										11		11
Kinosternon subrubrum s.	1			1								2
Sternotherus odoratus										1		1
Terrapene carolina c.	2	2S		2,1S	1,1S		3,1S	2,1S	2	1	4	17
Plestiodon fasciatus	12	6			5	5	5	6	3	7	15	64
Plestiodon laticeps	4		2	5	2	2	1					16
Scleoporus undulatus	5	1	4	2	3	4	2	1	1	5	1	29
Scincella lateralis	1	1		2		1	2		1	1		9
Carphophis amoenus	17	12	2	7	15	4	11	5	18	10	5	106
Coluber constrictor c	1			2	3		1	2	1	1		11
Diadophis punctatus	3				3						1	7
Lampropeltis getula			1									1
Nerodia sipedon								4		5		9
Pantherophis alleghaniensis					1				1		1	3
Storeria dekayi d.		1		2			2		2	1		8
Thamnophis sauritus .				1			1	2				4
Thamnophis sirtalis s							1				1	2
Virginia valeriae v.			1									1
Total Number of animals by site	102	31	33	31	50	30	58	54	42	69	49	550

L=larva, T=tadpoles, S=Shell, * = Site visited Sunday

Annotated Checklist

Amphibians

1. *Acris crepitans* (Eastern Cricket Frog)
   Eastern Cricket Frogs were observed calling in grassy wetland areas, along the margin of Rock Spring Pond, and in the tidal marsh at site 4. Many adults were hand captured and observed in grassy areas around and in small streams, and on the ground next to trails. Many hand-captured animals were inspected for disease and parasites but nothing unusual was documented.

2. *Anaxyrus americanus* (Eastern American Toad)
   This species was found in a wide variety of locations. Habitats included in grass, on the forest floor, under bark, under logs, in timber debris, in open fields, under stumps, and under a Jon Boat. Of 10 sites sampled, American Toads were found in 9. One chigger larvae was observed parasitizing a small toad. This mite was attached to the pectoral region.

3. *Anaxyrus fowleri* (Fowler's Toad)
   Fowler's Toads were typically found foraging in leaf litter. Several males were heard calling on Sunday morning at site 4.

4. *Hyla chrysoscelis* (Cope's Gray Treefrog)
   Hyla chrysoscelis males were calling from every site visited during the survey weekend. Calling males were heard calling high within the canopy of all the sites, most of these sites are adjacent to wetlands, small streams, and marshy areas.

5. *Hyla cinerea* (Green Treefrog)
   No Green Treefrogs were hand captured during the survey, only males were heard calling from wetlands at three sites.

6. *Lithobates catesbeianus* (American Bullfrog)
   Only two bullfrogs were documented during the survey time period. One was hand captured in the spillway coming out of Rock Spring Pond.

7. *Lithobates clamitans* (Green Frog)
   Of the Lithobatid frogs, the Green Frog was most frequently encountered. Males were heard calling along Rock Spring Pond, in water in various wetlands, and also calling from the tidal marsh at site 4.

8. *Lithobates palustris* (Pickerel Frog)
   Pickerel Frogs were mainly found at the edge of small streams and ephemeral pools. Numerous Pickerel Frogs were not captured because of their ability to jump into the water and escape. One juvenile which was captured was inspected and found to have 3 chigger mites on its hind leg.

9. *Lithobates sphenocephalus* (Southern Leopard Frog)
   Despite many hours of surveying and visiting a diversity of habitats, only one adult female Southern Leopard Frog was caught. This individual was carefully inspected to ensure it was not the newly described Atlantic Coast Leopard Frog (*Rana kauffeldi*) (Feinberg, et.al., 2014).

10. *Pseudacris crucifer* (Spring Peeper)
    Juvenile Spring Peepers were observed foraging on the forest floor near wetlands at four sites.

11. *Ambystoma maculatum* (Spotted Salamander)
    One Spotted Salamander larva and one old egg mass were dipnetted from a wetlands area at site 1. One adult salamander was found under a log in the forest near wetlands at site 5.

12. *Notophathalumus viridescens viridescens* (Red-spotted Newt)
    Red-spotted newts were found under debris and walking in a forest near a wetlands area. Only efts were reported on data sheets.

13. *Plethodon cinereus* (Eastern Red-Backed Salamander)
    A total of 22 Eastern Red-Backed Salamanders were found at four sites. All of these animals were found under logs.

14. *Pseudotriton ruber ruber* (Northern Red Salamander)
    One large adult northern red salamander was found under a log pile at site 10. Upon closer inspection this animal had a missing eye. This appeared to be an injury and not a malformation.

Reptiles

15. *Chelydra serpentina* (Snapping Turtle)
Two adult Snapping Turtles were captured in baited hoop turtle traps set in Rock Spring Pond. One other adult turtle was observing in the tidal marsh at site 4.

16. *Chrysemys picta picta* (Eastern Painted Turtle)
Eastern Painted Turtles were observed basking on logs in Rock Spring Pond on Friday. Several baited hoop traps placed at this site caught 10 turtles. One small female was missing the toes on its right foot. Another turtle was seen eating a dead sunfish.

17. *Kinosternon subrubrum subrubrum* (Eastern Mud Turtle)
Only two mud turtles were found during the survey weekend. One was found along the side of a small stream and a juvenile was found in tidal wetlands at site 4.

18. *Sternotherus odoratus* (Eastern Musk Turtle)
One adult Eastern Musk Turtle was seen basking on a log in Rock Spring Pond during the Saturday survey. After photographing the animal it went into the water and then 30 minutes later it can back and climbed back on the same log.

19. *Terrapene carolina carolina* (Eastern Box Turtle)
Six dry shells and 17 live Eastern Box Turtles were found during the survey. Turtles were found on the forest floor, in forms made of leaf litter, and among fallen debris. A male was found 6m from a female in a form made of leaf litter. One adult female was found to have 3 missing scutes.

20. *Plestiodon fasciatus* (Common Five-lined Skink)
A total of 64 Common Five-lined Skinks were observed or captured during the survey weekend. This is 12% of all animal observations reported. A mixture of males, females and juveniles were observed. Lizards were found basking on logs, inside logs, and under logs. One male had a tick in its armpit area and a female was also observed having several ticks in its armpit area.

21. *Plestiodon laticeps* (Broad-headed Skink)
Sixteen Broad-headed Skinks were found at 6 sites. Animals were reported on fallen trees, under bark, and on the ground beside trees. One lizard was observed eating an insect and one juvenile was observed with a regenerating tail.

22. *Sceloporus undulatus* (Eastern Fence Lizard)
Eastern Fence Lizards were found at all ten sites. This species was found on logs, along a concrete wall, on fallen trees, on the sides of trees, and along the ground near trails. Male fighting behavior was reported on three data sheets. One lizard was reported having a truncated tail and one lizard was observed with a heavy infestation of ticks.

23. *Scincella lateralis* (Little Brown Skink)
Scincella lateralis was found at seven of ten sites. This species was mainly observed running on the ground in leaf litter within forested habitats.

24. *Carphophis amoenus amoenus* (Eastern Wormsnake)
Of 550 animals found during the survey weekend, 106 were Eastern Wormsnakes. This comprises 19% of all animals found. Wormsnakes were found under logs, inside logs, under bark, under debris piles, under boards, under a canoe, under a barrel, and one gravid female was found in a rotten log. One snake was found dead, it was floating in a small woodland stream at site 10.

25. *Coluber constrictor constrictor* (Northern Black Racer)
Racers were found sitting in leaf litter in the forest at multiple sites, sunning on a log, and one was found under a canoe. One snake was found to have a bad scale on its bottom lip.

26. *Diadophis punctatus* (Ring-necked Snake)
Ring-necked Snakes were found under logs and under bark. One recorded snake had a complete neck ring and no marks on its belly.

27. *Lampropeltis getula* (Eastern Kingsnake)
Only one Eastern Kingsnake was found on the edge of the path at site 3.

28. *Nerodia sipedon sipedon* (Northern Watersnake)
Watersnakes were found basking on logs, along small streams, and several were found coiled in the middle of grass clumps by a small stream.

29. *Pantherophis alleghaniensis* (Eastern Ratsnake)
A total of three Eastern Ratsnakes were found at three sites. One was found on the forest floor, one was found along a woodland border, and one was found in a tree hollow approximately 2.1m off the ground.

30. *Storeria dekayi dekayi* (Northern Brownsnake)
Northern Brownsnakes were found in various habitats including under logs and under metal debris. Several snakes were observed foraging on the ground in wetlands and on the forest floor.

31. *Thamnophis sauritus sauritus* (Common Ribbonsnake)
Common Ribbonsnakes were all found near or in wetland areas. One juvenile ribbonsnake was found within feet of a juvenile Eastern Gartersnake at site 7. It was nice to find four ribbonsnakes considering this is a Virginia Wildlife Action Plan Tier IV species.

32. *Thamnophis sirtalis sirtalis* (Eastern Gartersnake)
    Two garter snakes were found, at sites 7 and 10. The juvenile on the forest floor at site 7 was found within a meter of a juvenile Common Ribbonsnake.

33. *Virginia valeriae valeriae* (Smooth Earth Snake)
    One Smooth Earth Snake was found under a log beside the trail at site 3.

Discussion

A number of herpetological diversity surveys have been reported in the literature for the Northern Neck of Virginia (Hill and Pierson, 1986; Eckerlin, 1991; Greenlee, 2001; Steele, 2006; and Perry, 2013). These reported sites lie to the east, west, and south of Westmoreland State Park. This gives us a good idea of the diversity for this region and each report serves as a guide as to which species may still be found in the park during future surveys. Within this report we have recorded 33 species of reptiles and amphibians for Westmoreland State Park. *Malaclemys terrapin terrapin* has also been observed on the property; one dead terrapin washed up on the shoreline late last fall (Ken Benson, pers. comm.). This brings the total documented for the park to around 34 species. This total is very similar to the range of total species found in surveys which have been conducted near the park. Hill and Pierson (1986) found 39 species in a one year survey of Caledon State Park, Eckerlin (1991) collected 31 species from George Washington Birthplace National Monument during 1986-1989, Greenlee (2001) recorded 29 species in a two day survey of Northumberland County, Lancaster County, and Middlesex County, Steele (2006) reported 32 species during a two day survey of Rappahannock River Valley National Wildlife Refuge, and Perry (2013) was able to find 22 species in a one day repeat survey of Caledon State Park. Since each of these published accounts have expected species lists for the area, we will conclude this discussion by stating some possible interesting biogeographical puzzles for this region.

The distribution of three anurans present a challenge to future investigations of this region. *Gastrophryne carolinensis* was reported in Greenlee (2001) but not in any other published reports

from Northern Neck sites to the west. One must think that perhaps northwestern Westmoreland County may be the end of its range (Mitchell and Reay, 1999). *Lithobates sylvatica* on the other hand was reported in Hill and Pierson (1986) in King George County but was not reported in any other survey in the Northern Neck. Future surveys may extend its known range east of Caledon State Park. The range and distribution of *Rana kauffeldi* (Feinberg, et.al., 2014) will need to be investigated in this region of Virginia. Since this is a newly described species for the state, its entire range will need clarification. Since all these species have conspicuous calls, members of the Virginia Frog and Toad Survey and FrogWatch USA may help extend the known ranges of these species in the Northern Neck. The depauperate species count for salamanders in Westmoreland State park probably represents either a lack of good habitat, bad luck in sampling, poor weather conditions, or not enough sampling effort. Hill and Pierson (1986) reported the largest number of salamander species at nine; and their research extended for a longer period of time and utilized drift net fences. One species, *Eurycea guttolineata* is surprisingly absent from the Northern Neck despite being found to the south, west, and in northern Virginia counties (Mitchell and Reay, 1999). What is the barrier preventing this species from the Northern Neck? The true range of one species of turtle, *Kinosternon baurii*, will be aided by more surveys with baited hoop turtle traps. This species is found on the southeastern end of the Northern Neck but its range probably extends further to the northwest. One lizard has a puzzling distribution on the Northern Neck. *Plestiodon inexpectatus* has been found at sites on the southeastern Northern Neck with a three county hiatus which ends in northern Virginia with several records in Fairfax and Loudoun counties. Are the records from Fairfax and Loudoun misidentifications or do they represent the most northerly range for this species? The last species that would be interesting to add to the list of herps found in the Northern Neck would be *Regina septemvittata*. This species is documented in Caroline County, which touches counties in the Northern Neck. It is interesting to speculate what current or what past barrier is preventing this species from being found in the Northern Neck. As a concluding note of interest, this survey only produced one observation of a snake with a lesion on its skin. This contrasts strongly with Steele's 2006 report on a survey close to Westmorland State Park in Richmond County. In that survey many snakes including different species were found to have skin lesions. As noted by the author, the spring leading up to that survey was cool and wet. The weather leading up to this survey was much different.

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