

Belmead BioBlitz and Ninth Annual HerpBlitz: Summary of Two Herp Surveys in Powhatan County, Virginia

Jason Daniel Gibson
Galileo Magnet High School
230 South Ridge Street
Danville, Virginia 24541

Introduction

Belmead is a diverse and large property located in northern Powhatan County. Belmead, in addition to an adjoining property called St. Francis, is owned and managed by Sisters of the Blessed Sacrament. FrancisEmma Inc, is a non-profit corporation which has been established to promote and conserve the environmental and historical aspects of this property. These two properties encompass 1052 hectares of land. This land consists of pastures, agricultural land, swamps, streams, hardwood and pine forests, vernal pools, riparian bottomland forest, and several historical structures including Belmead Mansion and St. Francis School. The property is bordered to the north by the James River and to the south by State Road 684. Powhatan County is centrally located in Virginia. It lies within the Piedmont physiographic province. Some herpetological survey work was conducted in Powhatan County in the late 1990's and early 2000's (Gibson, 2001a; Gibson 2001b; Gibson and Merkle, 2004) and a one day herp bioblitz of what was to be Powhatan State Park occurred on 8 May 2010 (P. Sattler, pers. comm.).

In 2013 Sister Jean, acting on behalf of FrancisEmma and the James River Master Naturalists contacted Dave Van Gelder about the Virginia Herpetological Society participating in a BioBlitz of the property. After this initial contact Dave became the herp group contact and leader for the VHS. The bioblitz ran for a 24 hour period on May 18th and 19th. The weekend of the BioBlitz was rainy and had suboptimum weather, therefore, it was agreed that the VHS would come back for a follow up survey to try to document more species. On 21 and 22 June 2014, the VHS returned and conducted the 2014 Belmead HerpBlitz. This was the ninth annual HerpBlitz that the VHS conducted. The report that follows details the findings of the 2013 and 2014 surveys and summarizes the current status of amphibian and reptile knowledge for Powhatan County.

Study Sites

FrancisEmma inc., working in conjunction with the James River Master Naturalists, divided the Belmead and St. Francis property into 19 distinct survey sections. A map showing each lettered section can be seen in Figure 1. The VHS did not have enough people or time to survey all the property so a few areas with high potential were selected to survey.

Site A:

This site consisted of a power line right-of-way with surrounding hardwood forests on either side. In the forest there were several springs. A large agricultural field was located in the northwest edge of this site.

Site B:

Site B included the remains of St. Francis School. Surrounding this school was a home site, a tall brick furnace, grassy fields, several old crumbling buildings, and debris piles from collapsed

or pushed over buildings. An interesting feature at this site was a tunnel near the school. Adjacent to the school was a mixed pine/hardwood forest and a small perennial stream.

Site C:

This site had several old quarry ponds, a perennial stream, and a mature hardwood forest.

Site G:

Site G contained some horse pastures, horse stables, maintenance buildings, and a mixed pine/hardwood forest. Deep Creek, a large perennial stream, borders the south side of this site.

Site J:

This site consisted of a large swampy wetlands. Hardwoods surround this wetlands. At the northern edge of this site this is a riparian area that meets the James River.

Site L:

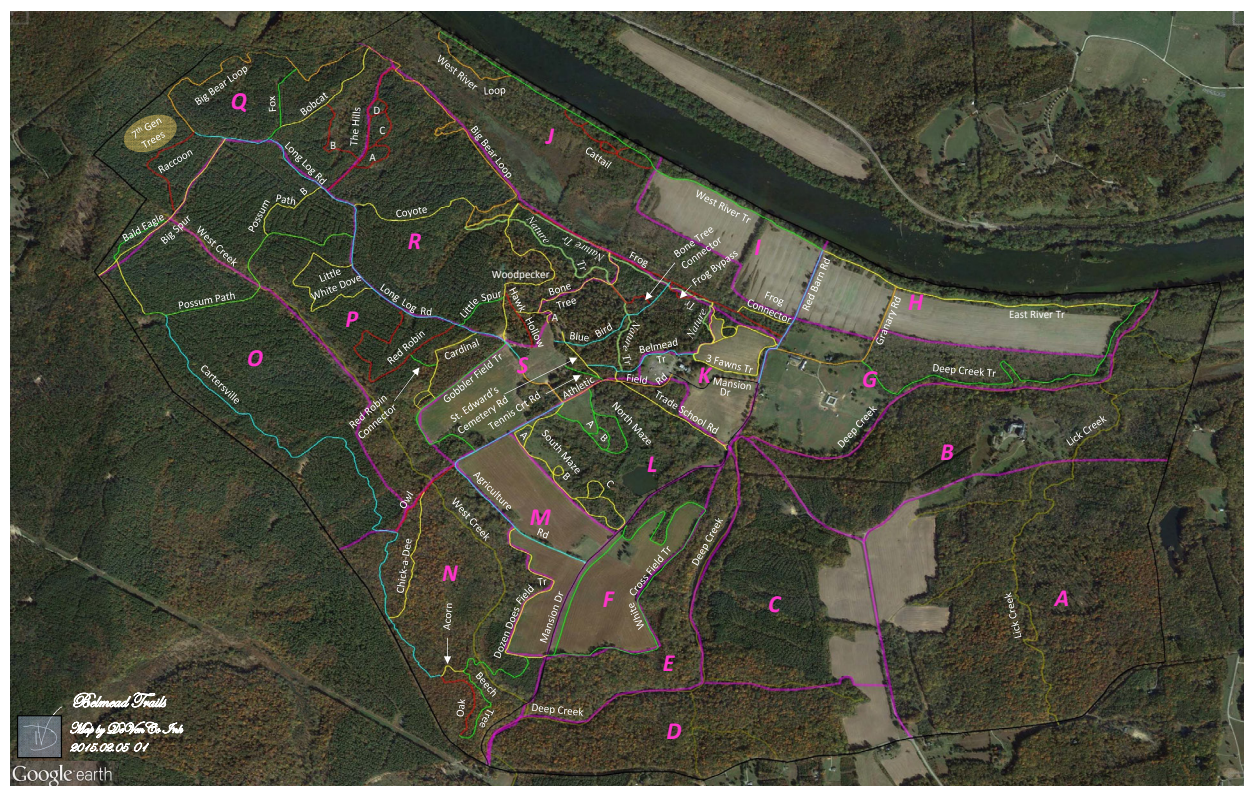
Site L included a small pond with a young mixed forest surrounding it.

Site N:

This site included a mature hardwood forest with a small perennial stream bisecting the property. Dotted along the site are several vernal pools.

Site R:

Site R consisted of the Mansion grounds. There were several debris piles and a surrounding mixed hardwood forest.



Materials and Methods

Similar data collection methods were utilized for both the 2013 and 2014 surveys with the exception that volunteers were divided into two teams for the 2014 survey. The 2013 survey had only enough people for one team. Collecting techniques included flipping over cover objects, visual observations, listening for calling anurans, hand capture, dipnetting, use of baited hoop turtle traps, and observing the roads for live and dead amphibians and reptiles. A quick visual inspection was made of all hand captured animals. Each animal was checked for malformations, injury, and disease. Group leaders were required to complete data sheets for each survey site and to digitally photograph any new county records or noteworthy observations. Tables 1 and 2 reflect the amount of survey time put into each survey site for each respective survey.

Table 1: The amount of survey effort per research site for 2013 survey.

	Site A	Site C	Site G	Site J1	Site J2	Site L
Number of surveyors	14	2	14	16	2	2
Hours surveyed	2	.1	1	1.5	.5	.1
Person hours of survey effort	28	.2	14	24	1	.2

Table 2: The amount of survey effort per research site for 2014 survey.

	Site B	Site G	Site J	Site L	Site N	Site R
Number of surveyors	13	5	12	5	11	5
Hours surveyed	2	.5	4	.5	3	1.4
Person hours of survey effort	26	2.5	48	2.5	33	7

Results

A total of 15 amphibians (nine anurans and six salamanders) and 18 reptiles (seven turtles, two lizards, and nine snakes) were observed in the 2013 and 2014 surveys. There were no county records found but one invasive species not previously recorded for Powhatan County, *Trachemys scripta elegans*, was caught in a turtle trap set in a pond at site L. Tables 3 and 4 summarize the species and number of animals found at each site for each respective survey date.

Table 3. Summary of the number of animals observed at each site for the 2013 survey.

Sites Species	A	C	G	J1	J2	L
Amphibians						
<i>Acris creptians</i>	1		3	13	LC	
<i>Anaxyrus americanus</i>	T					
<i>Anaxyrus fowleri</i>			2	1	8C	
<i>Hyla chrysoscelis</i>					LC	
<i>Hyla versicolor</i>			1C		LC	
<i>Lithobates catesbeianus</i>		1		LC		
<i>Lithobates clamitans</i>		1C				
<i>Lithobates palustris</i>			2			
<i>Pseudacris crucifer</i>			1C	1		
<i>Ambystoma maculatum</i>						
<i>Ambystoma opacum</i>	1			14		
<i>Desmognathus fuscus</i>						
<i>Eurycea cirrigera</i>						
<i>Notophthalmus viridescens</i>				1		
<i>Plethodon cylindraceus</i>	2					
Reptiles						
<i>Chelydra serpentina</i>		1		1		
<i>Chrysemys picta picta</i>						2
<i>Kinosternon subrubrum</i>						
<i>Pseudemys concinna concinna</i>						3
<i>Sternotherus odoratus</i>						1
<i>Terrapene carolina carolina</i>	1,1S					1D
<i>Trachemys scripta elegans</i>						
<i>Plestiodon fasciatus</i>			1	1		
<i>Scleoporus undulatus</i>						
<i>Agkistrodon contortrix mokasen</i>						
<i>Carphophis amoenus amoenus</i>	3					
<i>Coluber constrictor constrictor</i>	3					
<i>Diadophis punctatus</i>	1					
<i>Nerodia sipedon</i>		1				
<i>Opheodrys aestivus</i>						
<i>Pantherophis alleghaniensis</i>	1		SK			
<i>Storeria dekayi</i>				1		
<i>Virginia valeriae</i>						
Total Number of animals by site	13	4	10	32	8	7

D= Dead On Road, C=calling male, LC=large chorus, T=tadpoles, S=Shell, SK = shed skin, J1 = 5/18/13, J2 = 5/17/13

Belmead Survey

Table 4. Summary of the number of animals observed at each site for the 2014 survey.

<u>Sites</u> <u>Species</u>	B	G	J	L	LT	N	R
Amphibians							
<i>Acris crepitans</i>			13	C			
<i>Anaxyrus americanus</i>	1					2	
<i>Anaxyrus fowleri</i>	2		3				1
<i>Hyla chrysoscelis</i>							1C
<i>Hyla versicolor</i>							
<i>Lithobates catesbeianus</i>			5C				
<i>Lithobates clamitans</i>		1	9	C		4	
<i>Lithobates palustris</i>		1	7	1		1	
<i>Pseudacris crucifer</i>			32			2	1
<i>Ambystoma maculatum</i>						L	
<i>Ambystoma opacum</i>	3	1					1
<i>Desmognathus fuscus</i>			1				1
<i>Eurycea cirrigera</i>			1			1,2L	
<i>Notophthalmus viridescens</i>			4			3	
<i>Plethodon cylindraceus</i>			2			1	
Reptiles							
<i>Chelydra serpentina serpentina</i>					1		
<i>Chrysemys picta picta</i>							
<i>Kinosternon subrubrum</i>				2			
<i>Pseudemys concinna concinna</i>							1
<i>Sternotherus odoratus</i>			1				
<i>Terrapene carolina carolina</i>	2S		3			1De	
<i>Trachemys scripta scripta</i>					1		
<i>Plestiodon fasciatus</i>						1	1
<i>Sceloporus undulatus</i>	1						
<i>Agkistrodon contortrix mokasen</i>	1						
<i>Carphophis amoenus amoenus</i>	1					5	2
<i>Coluber constrictor constrictor</i>	1		1			1	
<i>Diadophis punctatus</i>	1		2			3	1
<i>Nerodia sipedon</i>							
<i>Opheodrys aestivus</i>			1				
<i>Pantherophis alleghaniensis</i>	2						
<i>Storeria dekayi</i>							
<i>Virginia valeriae</i>	1						
Total Number of animals by site	14	3	85	3	2	25	10

D= Dead On Road, De = dead, C=calling male, LC=large chorus, LT = Site L turtle traps
T=tadpoles, S=Shell, SK = shed skin

Annotated Checklist

Amphibians

1. *Acris crepitans* (Eastern Cricket Frog)

Eastern Cricket Frogs were heard calling on 17 May 2013 and 31 June 2014. Cricket frogs were hand captured along the wetland at site J and in a grassy road rut at site G.

2. *Anaxyrus americanus* (American Toad)

One adult American Toad was found on top of a log at site N and one juvenile American Toad was found in grass by the school building at site B. Tadpoles were observed in a road rut at site A on 18 May 2013.

3. *Anaxyrus fowleri* (Fowler's Toad)

Fowler's Toads were found in grass by road ruts, under cover boards, under tin, and foraging on dirt roads and trails. Calling males were heard on 17 May 2013.

4. *Hyla chrysoscelis* (Cope's Gray Treefrog)

Only calling male Cope's Gray Treefrogs were found during both survey time periods. A large chorus of males were heard at site J on 17 May 2013. One calling male was heard calling from the woods at site R on 22 June 2014.

5. *Hyla versicolor* (Common Gray Treefrog)

A large chorus of *Hyla versicolor* males was heard at site J on 17 May 2013. A single calling male was recorded at site G on 18 May 2013.

6. *Lithobates catesbeianus* (American Bullfrog)

American Bullfrogs were heard calling on 18 May 2013 and 31 June 2014. Both of these observations were recorded from the wetlands at site J.

7. *Lithobates clamitans* (Green Frog)

Green frog males were heard calling on 17 May 2013 and 21 and 22 May 2014. Males were heard calling from the wetlands at site J, a pond at site L, and by a stream at site N. One adult was found in a basement of a barn at site G.

8. *Lithobates palustris* (Pickerel Frog)

Pickerel frogs were hand captured under cover boards, in a barn basement, by streams, in vegetation by a pond and in road rut water. One adult Pickerel Frog was inspected and found to have 43 chiggers on its legs.

9. *Pseudacris crucifer* (Spring Peeper)

A single calling male was recorded on 18 May 2013. Adult and metamorph spring peepers were found along the shore of a pond, on the forest floor and along the trails at sites G, J, N, and R.

10. *Ambystoma maculatum* (Spotted Salamander)

Only Spotted Salamander larvae were found at site N, during the 2014 survey. There are many vernal pools on the Belmead property so surveys in the late winter or early spring should yield many *Ambystoma maculatum* adult observations.

Belmead Survey

11. *Ambystoma opacum* (Marbled Salamander)

A total of 15 Marbled Salamanders were found during the 2013 survey. Fourteen adults were found at site J alone. Marbled Salamanders were found under logs, under railroad ties, in rotten logs, and a neonate was found in a barn basement at site G. The most unusual place where salamanders were found was in a tunnel near the St. Francis School at site B. It was unclear whether the salamanders were living and breeding in the tunnel or if they were trapped in the tunnel. See below for a photograph of a male and female marbled salamander.



12. *Desmognathus fuscus* (Northern Dusky Salamander)

Two adult Northern Dusky salamanders were found in streams at sites J and R. One was found in a stream the other was found under a rock.

13. *Eurycea cirrigera* (Two-lined Salamander)

Two larvae and two adult *Eurycea cirrigera* were found during the 2014 survey. Salamanders were found under bark, leaf litter, and a rock in a stream; one adult salamander was found 20 m from the stream on top of a log at site N.

14. *Notophthalmus viridescens* (Red-spotted Newt)

Only eft stage Red-spotted Newts were found during both surveys. Efts were observed walking on the ground, on a log, and under logs.

15. *Plethodon cylindraceus* (White-spotted Slimy Salamander)

A total of 5 slimy salamanders were found; 2 at site A, 2 at site J, and 1 at site N. These animals were found under logs and under bark/leaf litter and one adult was found 20 m from the stream on top of a log.

Reptiles

16. *Chelydra serpentina* (Snapping Turtle)

One adult *Chelydra serpentina* was observed swimming in a stream at site C, and one adult was caught in a baited hoop turtle trap at site L.

17. *Chrysemys picta picta* (Eastern Painted Turtle)

Two Eastern Painted Turtles were spotted basking on logs along the margin of the pond at site L.

18. *Kinosternon subrubrum* (Eastern Mud Turtle)

A male and a female pair of Eastern Mud Turtles were found on the shore next to the pond at site L.

19. *Pseudemys concinna concinna* (Eastern River Cooter)

Three adults were observing basking on logs in the pond at site L. One adult was found on the road near site R on 22 June 2014; presumably it was a female looking for a nesting site.

20. *Sternotherus odoratus* (Stinkpot)

The 2013 BioBlitz fish group found one Stinkpot at site L. Another observation of a Stinkpot was made in 2014. This adult was found sitting on a trail at site J.

21. *Terrapene carolina carolina* (Eastern Box Turtle)

A mixture of live and dead Eastern Box Turtles were found the two years of the surveys. On 17 May 2013 a DOR turtle was found on the road by the pond at site L. On 18 May 2013 an adult female turtle was hand captured in a grassy powerline right of way at site A and found to be eating an *Apheloria virginiensis corrugata* millipede (millipede identification was obtained from P. Marek, pers. comm). What is significant about this observation is the fact that this species of millipede is known to produce benzaldehyde and hydrogen cyanide. These two chemicals make this millipede very poisonous. See below for a photograph of this observation. Two adult shells were found in a tunnel at site B. Presumably these turtles got into the tunnel and could not get out. One adult turtle was found floating in a creek dead. The cause of death could not be determined. At site J two turtles were found walking in a dry creek bed.



22. *Trachemys scripta elegans* (Red-eared Slider)

A turtle trap, baited with canned green beans and canned sardines, yielded one adult Red-eared Slider. On visual inspection the turtle was found to have a deformed shell. The general consensus among members was that the deformity probably came from improper care before

Belmead Survey

the animal was released into the pond. Since this was an invasive species, a DGIF employee removed the animal. Despite scanning the margin of the pond with a spotting scope and binoculars in 2013 and 2014 no other Red-eared Sliders were observed.



23. *Plestiodon fasciatus* (Five-lined Skink)

Adult Five-lined Skinks were found in a log, under a cooler, in a building, and climbing a tree. One skink was found with one tick attached.

24. *Sceloporus undulatus* (Fence Lizard)

One adult Fence Lizard was observed climbing on the bricks of an old furnace at Site B.

25. *Agkistrodon contortrix mokasen* (Northern Copperhead)

A single adult Northern Copperhead was found under a debris pile at site B.

26. *Carphophis amoenus amoenus* (Eastern Wormsnake)

Eastern Wormsnakes were the most commonly found snakes with a total of 11 being found. Snakes were found under cover boards, under metal, under logs, in logs, under bark, and one was found under a paint can in a trash pile.

27. *Coluber constrictor constrictor* (Northern Black Racer)

A total of six black racers were found. Several were observing basking but the majority were found under tin and old plywood.

28. *Diadophis punctatus* (Ring-necked Snake)

Eight Ring-necked Snakes were found in the two years of surveys. All of the animals expressed the full neck band. The snakes were found under bark, under logs, under debris piles, and under tin

29. *Nerodia sipedon* (Northern Watersnake)

Surprisingly only one adult Northern Watersnake was found in two separate surveys. This adult was observed swimming in a stream at site C.

30. *Opheodrys aestivus* (Rough Greensnake)

One adult Rough Greensnake was found at site J. It was observed climbing along a downed tree.

31. *Pantherophis alleghaniensis* (Eastern Ratsnake)

Two adult and one young adult snakes were found during the two surveys. One adult was found under a log and the other two snakes were found in grassy fields.

32. *Storeria dekayi* (Northern Brownsnake)

Only one Northern Brownsnake was found during both surveys. It was found under a log in a hardwood forest by a swamp at site J. A Marbled Salamander was found under the same log as the snake.

33. *Virginia valeriae* (Smooth Earth Snake)

One adult gravid female was found under plywood at site B.

Discussion

After conducting herpetological surveys in 2013 and 2014 and adding one species not found by the VHS but documented for the property, *Lithobates sylvaticus* (J. Ryan, pers. comm.), we now can report that the combined properties of Belmead and St. Francis host a total of 16 amphibians (10 anurans and six salamanders) and 18 reptiles (seven turtles, two lizards, and nine snakes) for a grand total of 34 species. This is 64% of the estimated total number of species currently thought to live in Powhatan County (see Table 5. for a complete list of known species for Powhatan County). For people conducting future work at the property, Table 5 can be used as a species list to begin target searches to add to the total for the property.

To date there have been 53 documented species of reptiles and amphibians in Powhatan County. This includes 25 amphibians (15 anurans and 10 salamanders) and 28 species of reptiles (seven turtles, 5 lizards, and 16 snakes). Since the work done by Gibson (Gibson, 2001a; Gibson 2001b; and Gibson and Merkle, 2004) in the late 1990's and early 2000's in Powhatan County, there has been a county record confirmation and range extension in Powhatan County for *Hyla cinerea*, there has also been two new county records including the addition of *Lithobates sylvaticus* (Whitehurst and Wright, 2010) and *Lithobates sphenocephalus* (Powhatan State Park BioBlitz reporting forms, unpublished data) and one new invasive species, *Trachemys scripta elegans*, reported in this paper. For people working in Powhatan County in the future we suggest being on the lookout for the following species. *Pseudacris brimleyi* is the only conceivable species of anuran which could be added to Powhatan's species list. It has been observed just across the eastern border of Powhatan County in Chesterfield County. Reporting any information on the distribution or status of *Scaphiopus holbrookii*, a Tier IV conservation status species, would also be useful. In regards to salamanders, *Pseudotriton montanus montanus* has been recorded in counties to the north and south, and *Siren lacertina* has been found in Amelia County to the south (Woodward, 1998). Three turtle species which should be sought after include *Kinosternon baurii*, has been found in a connecting county to the east; *Pseudemys rubriventris*, has been documented to the north and east in joining counties; and *Clemmys guttata* which has been found in Amelia (Clifford, 2006) and Cumberland Counties (Ritchie, 2004) to the south and west. Information on *Clemmys guttata* would be a high priority due to its Tier III conservation status. Lizard species to watch out for include *Aspidoscelis sexlineata sexlineata* and *Plestidon laticeps*.

Belmead Survey

Both of these species are recorded from bordering counties. Additional notes or distribution records on *Ophisaurus attenuates longicaudus*, a Tier IV conservation species, would be welcomed. Wright (1996) published a field note and location on this species which could serve as a starting point to finding new locations or at least confirming its status in Powhatan. Snakes possible for Powhatan County include *Farancia abacura abacura*, which has been found in Amelia County, *Farancia erythrogramma erythrogramma* which is documented in the north/west portion of Chesterfield County, *Lampropeltis triangulum triangulum*, which has a wide state distribution, *Regina septemvittata* which has been documented in counties surrounding Powhatan Co., *Thamnophis sauritus sauritus* which is found in surrounding counties, and *Virginia striatula* which is found in a joining county to the east.

In addition to biogeographical data on species residing in Powhatan, more work needs to be conducted on basic natural history information on all species (Mitchell and Pague, 2014). Information on clutch sizes, behavior, diet, population sizes, rates of parasitism and disease could occupy interested people for many lifetimes. This basic information is lacking but is necessary to better understand how to preserve these species.

Table 5. Summary of all known surveys and documented species for Powhatan County, Virginia.

Sites	M	G	P	B
Species				
Amphibians				
<i>Acris crepitans</i>	X	X	X	X
<i>Anaxyrus americanus</i>	X	X	X	X
<i>Anaxyrus fowleri</i>	X	X	X	X
<i>Gastrophryne carolinensis</i>		X	X	
<i>Hyla chrysoscelis</i>	X	X		X
<i>Hyla cinerea</i>		X		
<i>Hyla versicolor</i>	X	X		X
<i>Lithobates catesbeianus</i>	X	X	X	X
<i>Lithobates clamitans</i>	X	X	X	X
<i>Lithobates palustris</i>		X		X
<i>Lithobates sphenoccephalus</i>			X	
<i>Lithobates sylvaticus</i>			X	*
<i>Pseudacris crucifer</i>	X	X	X	X
<i>Pseudacris feriarum</i>	X	X		
<i>Scaphiopus holbrookii</i>	X			
<i>Ambystoma maculatum</i>	X	X	X	X
<i>Ambystoma opacum</i>	X	X	X	X
<i>Desmognathus fuscus</i>		X		X
<i>Eurycea cirrigera</i>		X	X	X
<i>Eurycea guttolineata</i>	X	X		X
<i>Hemidactylium scutatum</i>		X	X	
<i>Notophthalmus viridescens</i>	X	X	X	X
<i>Plethodon cinereus</i>	X	X	X	
<i>Plethodon cylindraceus</i>	X	X		X
<i>Pseudotriton ruber</i>	X			
Reptiles				
<i>Chelydra serpentina</i>	X	X		X

<i>Chrysemys picta picta</i>	X	X		X
<i>Kinosternon subrubrum</i>	X	X		X
<i>Pseudemys concinna concinna</i>	X	X		X
<i>Sternotherus odoratus</i>	X	X		X
<i>Terrapene carolina carolina</i>	X	X	X	X
<i>Trachemys scripta elegans</i>				X
<i>Ophisaurus attenuates longicaudus</i>	X			
<i>Plestiodon fasciatus</i>	X	X	X	X
<i>Plestiodon inexpectatus</i>	X	X		
<i>Scincella lateralis</i>		X		
<i>Sceloporus undulatus</i>	X	X	X	X
<i>Agkistrodon contortrix mokasen</i>	X	X		X
<i>Carphophis amoenus amoenus</i>	X	X	X	X
<i>Cemophora coccinea copei</i>	X			
<i>Coluber constrictor constrictor</i>	X	X	X	X
<i>Diadophis punctatus edwardsii</i>	X	X	X	X
<i>Heterodon platirhinos</i>	X	X	X	
<i>Lampropeltis calligaster rhombomaculata</i>	X	X		
<i>Lampropeltis getula</i>		X		
<i>Nerodia sipedon</i>	X	X		X
<i>Opheodrys aestivus</i>	X	X	X	X
<i>Pantherophis alleghaniensis</i>	X	X	X	X
<i>Pantherophis guttatus</i>	X	X		
<i>Storeria dekayi dekayi</i>		X		X
<i>Storeria occipitomaculata o.</i>	X	X		
<i>Thamnophi sirtalis sirtalis</i>	X	X		
<i>Virginia valeriae</i>	X			X

M = Mitchell and Reay, 1999, G = Gibson, 2001, P = Powhatan State Park Survey 5/8/2010 (unpublished data, acquired from Paul Sattler), B = Belmead/St Francis Survey 2013, 2014, * = recorded for Belmead but not found during this survey work.

Acknowledgments

First and foremost the VHS would like to thank Sister Jean Ryan and other Sisters of the Blessed Sacrament and the James River Master Naturalists for their willingness to organize the BioBlitz in 2013. The 2013 event was one of the most well run BioBlitzes the VHS has ever attended. We also appreciate Sister Jean for inviting us back in 2014. Sister Jean is a great steward of the environment. We would also like to thank Dave Van Gelder for leading the VHS team for the first BioBlitz and for helping in coordinating the second HerpBlitz. He generously housed and fed several members for both the 2013 and 2014 surveys. I thank Susan Watson and Paul Sattler for making earlier drafts of this manuscript better. Lastly, the VHS would like to thank all of the volunteers who came out to help with the survey. Listed below are the volunteers for each survey.

2013 Survey Volunteers

Jason Gibson, Julia Hebert, Brian and Mitchell Kim, Larry Mendoza, Julia Murphy, Mike and Arathi Salotti, Gary Sargent, Paul Sattler, Susan Shepperson, Igor Siwonowicz, Wes and Dave Van Gelder, and Tom Yates.

Belmead Survey



2014 Survey Volunteers

Craig Abbott, Joe Banashek, Jesse Ferrell, Robert and Rosemary Frezza, Zach Gajewski, Jason Gibson, Bari Hamrick, Bryan LePere, Nathan LePere, Samy Nuchols, Craig Odell, Sandy Ogelsby, Dave Perry, Rosalind and Madison Ryan, Katherine and Gene Sattler, Paul Sattler, Mickey Silberbauer, Sarah Sterritt, Meredith Swarwout, Dave Van Gelder, Susan Watson, Amy, Cherise, John, and Jennifer White.



Literature Cited

- Clifford, M. 2006. Field notes: *Clemmys guttata* (Spotted Turtle). *Catesbeiana* 26(2): 73-74.
- Gibson, J.D. 2001a. Amphibians and reptiles of Powhatan County, Virginia. *Catesbeiana* 21(1): 3-28.
- Gibson, J.D. 2001b. Turtle mortality in Powhatan County, Virginia. *Catesbeiana* 21(2): 65-68.
- Gibson, J.D. and D. Merkle. 2004. Road mortality of snakes in central Virginia. *Banisteria*, Number 24: 8-14.
- Mitchell, J.C. and C. A. Pague. 2014. Filling gaps in life-history data: clutch sizes for 21 species of North American anurans. *Herpetological Conservation and Biology* 9(3): 495-501.
- 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.
- Ritchie, S. 2004. Field notes: *Clemmys guttata* (Spotted Turtle). *Catesbeiana* 24(2): 74.
- Whitehurst, M. and A. Wright. 2010. Field notes: *Lithobates sylvatica* (Wood Frog). *Catesbeiana* 30(2): 87.
- Whitehurst, M. and A. Wright. 2011. Field notes: *Hyla cinerea* (Green Treefrog). *Catesbeiana* 31(2): 78.
- Woodward, K.O. 1998. Field notes: *Siren lacertina* (Greater Siren). *Catesbeiana* 18(1): 15-16.
- Wright, R.A. 1996. Field notes: *Ophisaurus attenuatus* (Eastern Slender Glass Lizard). *Catesbeiana* 16(1):12.