

Herpetological Survey of Natural Bridge Park 11 and 12 June, 2016

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Abstract: On 11 and 12 June 2019 the Virginia Herpetological Society conducted a field survey of several diverse habitats located in Natural Bridge Park (NBP) in Rockbridge County, Virginia to identify amphibian and reptile species within NBP. Operational Management of NBP was assumed by the Virginia Department of Conservation and Recreation (VDCR) on September 24, 2016 and this report provides VDCR with an initial inventory of amphibian and reptile species for this new state park. Thirteen Amphibian (4 anuran and 9 salamander) and thirteen reptile (9 snake, 2 turtle and 2 lizard) species were positively identified. Noteworthy species included *Eurycea lucifuga* (Cave Salamander), *Plethodon hoffmani* (Valley and Ridge Salamander), *Lampropeltis t. triangulum* (Eastern Milksnake), *Regina septemvittata* (Queensnake) and *Terrapene c. carolina* (Woodland Box Turtle). One adult *E. lucifuga* was observed in an unusual habitat, about 28 meters inside the third chamber of a cavern far from the entrance and any visible openings. *E. lucifuga* usually inhabit the twilight zone area of caves, where there is some light but not enough for plants to grow. The sex of 10 *T. c. carolina* were identified, 9 of which were male. The 9/1 sex ratio of males to females is much higher than the 1/2 and 1.2/1 sex ratios reported in two previous Virginia distribution studies for *T. c. carolina*.

Key Words: Natural Bridge State Park, *Eurycea lucifuga*, *Lampropeltis t. Triangulum*, *Plethodon hoffmani*, *Regina septemvittata*, and *Terrapene c. carolina*

INTRODUCTION

Natural Bridge Park (NBP) is located in Natural Bridge, VA in Rockbridge County and contains the Natural Bridge which is a U.S. national historic landmark. This natural arch is approximately 66 meters (250 ft) high, spans 27 meters (90 ft) and is situated within a gorge carved from surrounding mountainous terrain by Cedar Creek, a tributary of the James River. On the dates of the survey, there were approximately 623 hectares (1,540 acres) of surrounding and nearby woodlands, grasslands, creeks, caves and ravines within NBP that are privately owned by the Virginia Conservation Legacy Fund (VCLF). VCLF acquired the property in 2013 to prevent it from being auctioned in parcels and to preserve the Natural Bridge and the surrounding natural habitat. However, as a result of an inability to service the debt required to acquire the property under their operational management, VCLF

has accepted an offer from the Commonwealth of Virginia to manage this property as a Virginia State Park. It will continue to be owned by VCLF until all debts are repaid. The operational management transition occurred on September 24, 2016.

NBP is located at the top of Southside Virginia of the state's western Appalachian Mountains, what geologists call the Valley and Ridge Province. The parallel folds of mountains and valleys all run in a northeast-southwest direction. The valleys and rivers have served as a natural migration route for wildlife. Virginia's Valley and Ridge region is part of a gigantic trough that runs from Quebec to Alabama. Virginia's portion is distinctive for its size (greater than any other state), its narrow and elongated parallel ridges (3,000-4,000 feet high), flat lush valleys, gentle topography, caves, caverns and hot springs" (Smith 1998).

The Virginia Herpetological Society (VHS) selected NBP for its Annual Spring Survey as NBP contains some very interesting habitats for a variety of amphibian and reptile species and has not been previously surveyed by VHS. A VHS survey will also provide the Virginia Department of Conservation and Recreation (“VDCR”) with an initial inventory of amphibian and reptile species for its new state park. Two survey dates were selected, Saturday 11 June and Sunday 12 June 2019. A total of 56 volunteers participated in the survey on 11 June and 21 volunteers participated on 12 June.

Survey Sites

The following is a general description of the survey zones. GPS coordinates were obtained via Google satellite maps at the approximate zone location contained in Figure 1.

Sites 1 and 2 - Golf Course Road Site-1 (N37.626052, W-79.550469) is located on the west side of Golf Course Road (State Route 760) and Site-2 (N37.624558, W-79.546601) is located on the east of Golf Course Road. The two sites are very similar in habitat with mixed hardwood and pine forest bordering large grassy meadows. Site-1 extends to the western NBP boundary. Site-2 contains some poorly maintained structures on its southern end and borders a ravine and creek and extends to site-4 on its eastern end. Both of these zones were surveyed on 11 June by the same survey group.

Site 3 - Cedar Creek Trail Site-3 (N37.634699, W-79.54893) is the area west of U.S. Route 11 to the western NBP boundary along cedar creek trail. Site-3 contains mixed hardwood and pine forest, creeks and caves. At the eastern end of Site 3 there is the Monacan Village, a large dump, some maintenance facilities and other structures. The westerly end of site-3 was surveyed on 11 June and the east and west

ends were surveyed on 12 June.

Site 4 - State Route 608 Site-4 (N37.62642, W-79.539408) is the area east and west of State Route 608 and abuts site-2 on the west end, the NBP boundary on the south end and site-10 on the east end. Site-4 has a creek with steep ravines and rocky outcrops among mixed hardwood and pine forest. Tree species in site-4 include maples, oaks, chestnuts, pines as well as a variety of fern species. Site-4 was surveyed on 11 June.

Site 5 – Foamhedge Sites-5&6 are named for the foam replica of Stonehenge located in the northeast corner of Zone-6. Site-5 (N37.643484, W-79.549198) abuts NBP boundaries to the west and north, sites-6&7 to the east and site-3 to the south. Site-6 (N37.637163, W-79.551601) borders U.S. Route 11 to the east, site-3 to the south, site-5 to the west and site-7 to the north. Sites 5&6 have similar habitats of mixed hardwood and pine forest, open fields and wetlands. Sites 5&6 were surveyed on 11 June by the same survey group.

Site 7 - State Route 743 West Site-7 (N37.645285, W-79.540958) is the area at the northern boundary of NBP west of State Route 743. It borders Site-6 to the south and Site-5 to the west. Site-7 is comprised of mixed hardwood and pine forest, grassy meadows and contains a vernal pool. Site-7 was surveyed on 11 June.

Site 8 - Caverns Site-8 (N37.636891, W-79.536490) is located east of U.S. Route 11 and is boarded by Site- 9 to the south and the east and the NBP boundary to the north. Its habitat is mixed hardwood and pine forest, with scarlet oak, tulip, hickory, redbud and some evergreen trees but Natural Bridge Caverns are the most notable feature. Site- 8 was surveyed on 11 June.

Site 10 - West Faulkner Site-10 (N37.631776, W-79.530959) is the area east

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and west of West Faulkner Highway (State Route 130). Site-10 is bordered by Sites-4 and 9 to the west and NBP boundaries to the north and the east. The habitat in Site-10 is

mixed hardwood and pine forest, grassy meadows and creeks. Site-10 was surveyed on 11 June.

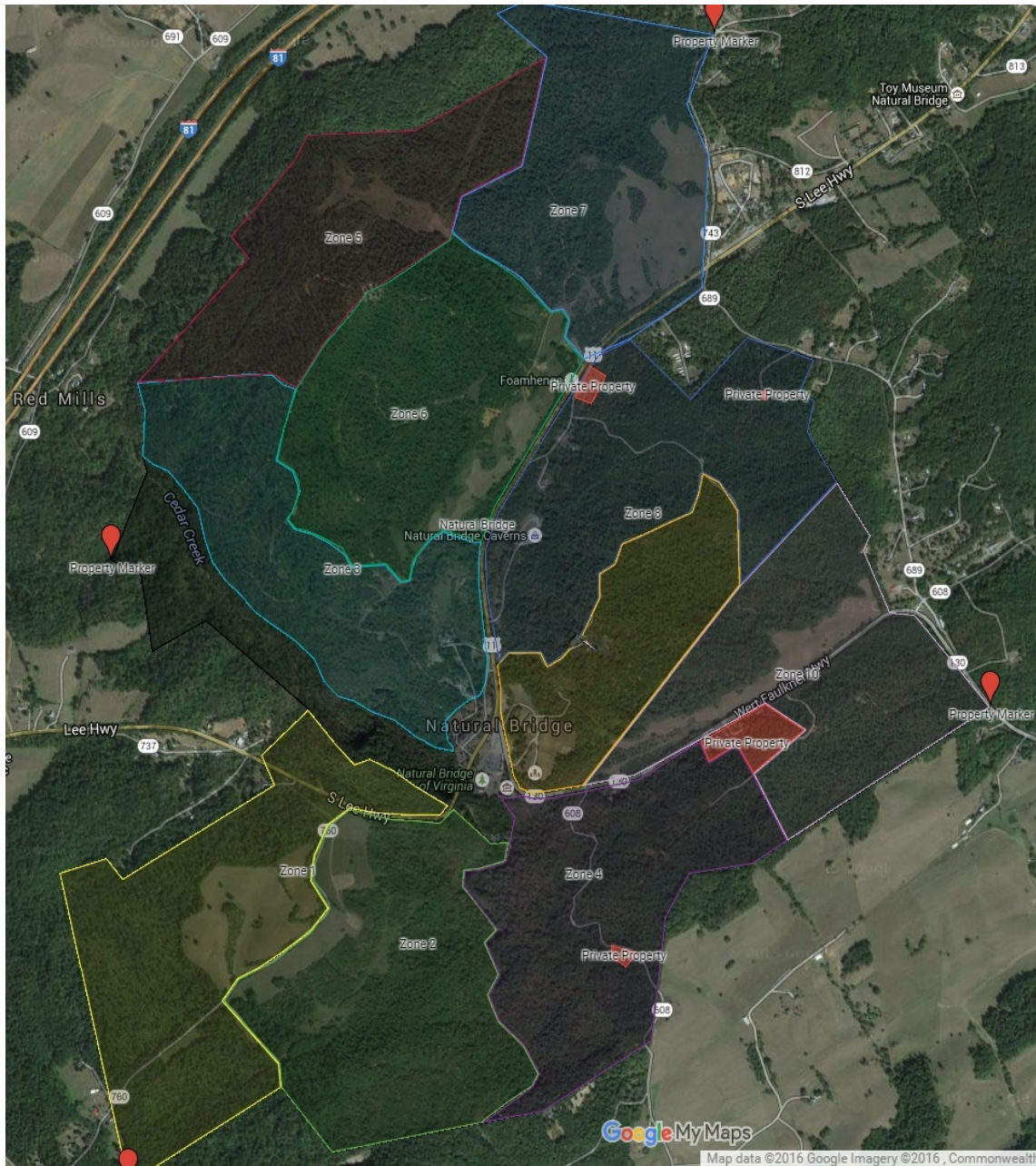


Figure 1 The survey sites within NBP.

MATERIALS AND METHODS

Fifty-six volunteers participated in the survey for approximately 5 hours (from 08:30 to

14:00h), excluding time spent in transit, in the field on 11

June and 21 volunteers participated for

approximately 3 hours (from 9:00 to 12:00h) in the field on 12 June for a net survey total of about 343 person hours (Tables 1 and 2). Due to the large number of participants, 7 survey groups were organized to survey 9 zones within NBP on 11 June (All of the zones as described above). In Site 8, 10 surveyors surveyed for 5 hours and an additional 4 surveyors joined them for 3 hours. Weather conditions were sunny and hot for most of the day, with temperatures ranging from 20° to 35° C. Two survey groups were organized to survey different sections of Site 3 on 12 June. Weather conditions remained sunny and hot.

Prior to each survey, all participant footwear and survey gear (snake hooks, field sticks,

dip nets etc.) were disinfected using Nolvasan® Solution (chlorhexidine diacetate). Survey participants on both survey days used multiple collecting methods to find amphibians and reptiles, including visual observation, listening for calling anurans, hand capture and over-turning objects with 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 some of the captured animals prior to their release at the site of capture. Survey group leaders summarized and submitted all relevant data on VHS survey group data sheets. The following tables summarize the survey effort

Table 1. Summary of the survey effort on 11 June 2016

Survey Site	No. of Surveyors	Hours	Estimated Person Hours
1-Golf Course Road	6	5	30
3-Cedar Creek Trail	12	5	60
4-State Route 608	11	5	55
5-Foamhenge	10	5	50
7-State Route 743West	3	5	15
8- Caverns	10	5	50
8- Caverns	4	3	12
10-West Faulkner	4	2	8
Total	56	35	280

Table 2. Summary of the survey effort on 12 June 2016

Survey Site	No. of Surveyors	Hours	Estimated Person Hours
3-Cedar Creek (East)	12	3	36
3-Cedar Creek (West)	9	3	27
Total	21	6	63

RESULTS

During the 2 days of survey a total of 26 species were captured or positively identified, including 13 amphibians and 13 reptiles (Table 3). The survey produced a total of 4 anuran, 9 salamander, 9 snake, 2

turtle and 2 lizard species. More than 139 animals were captured or positively identified. However, there may be some redundancy in the animal count recorded for Site 3 as this zone was surveyed by one survey group on 11 June and 2 survey groups on 12 June. .

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Table 3. Amphibian and reptiles observed at Natural Bridge State Park.

Species/Site	1	3	4	5	7	8	10	Total
Class Amphibia								
<i>Anaxyrus a. americanus</i>		1	2					3
<i>Hyla versicolor</i>						2		2
<i>Lithobates catesbeianus</i>		1		2			1	4
<i>Lithobates clamitans</i>		2	1	4				7
<i>Desmognathus fuscus</i>		10	1				1	12
<i>Desmognathus monticola</i>		1						1
<i>Eurycea cirrigera</i>		1	1				1	3
<i>Eurycea l. longicauda</i>			7	2				9
<i>Eurycea lucifuga</i>		9				>21		>30
<i>Notophthalmus viridescens</i>		2			2			4
<i>Plethodon cinereus</i>			1					1
<i>Plethodon cylindraceus</i>			1			1		2
<i>Plethodon hoffmani</i>						2		2
Total Amphibians	0	27	14	8	2	>26	3	>80
Class Reptilia								
<i>Agkistrodon contortrix</i>				1				1
<i>Carphophis a. amoenus</i>		2					1	3
<i>Coluber c. constrictor</i>		1		2				3
<i>Diadophis punctatus edwardsii</i>	1							1
<i>Lampropeltis t. triangulum</i>	1							1
<i>Nerodia s. sipedon</i>		4	1	1			1	7
<i>Pantherophis alleghaniensis</i>		4	1	1				6
<i>Regina septemvittata</i>		6	1				1	8
<i>Thamnophis s. sirtalis</i>			1					1
<i>Chelydra serpentina</i>	1	1					1	3
<i>Terrapene c. carolina</i>	2	3	5	5	1	1	1	18
<i>Plestiodon fasciatus</i>		2	1			1		4
<i>Sceloporus undulatus</i>	1	1		1				3
Total Reptiles	6	24	10	11	1	2	5	59
Grand Total	6	51	24	19	3	>28	8	>139

ANNOTATED CHECKLIST

Amphibians

1. *Anaxyrus a. americanus* (American Toad)
One adult male American Toad was heard

calling in Site 3 and 2 other adults were captured in Site 4 on 11 June. One of the captured toads was in a leafy area next to a creek and some rocks and the other captured adult was on a mossy patch next to a ravine.

2. *Hyla versicolor* (Gray treefrog) Two adult male Gray Treefrogs were heard calling within Site 8 on 11 June.

3. *Lithobates catesbeianus* (American Bullfrog) One adult American Bullfrog was observed in a wetland swamp and another adult male was heard calling from a creek near a bridge within Site 5 on 11 June. One adult American Bullfrog was observed in a pond near the café within Site 3 West on 12 June.

4. *Lithobates clamitans* (Green Frog) One Green Frog tadpole was observed in a creek within Site 3 and 3 adult male Green Frogs were heard calling from a creek within Site 5 on 11 June. Two of these calling males were also seen. One adult green frog was captured under a rock in a creek within Site 4 and appeared to be healthy. A fifth adult Green Frog was observed within Site 5 sitting on a log within the creek. One adult Green Frog was seen next to a creek within Site 3 East on 12 June.

5. *Desmognathus fuscus* (Northern Dusky Salamander) One adult Northern Dusky Salamander was captured from under a rock near a stream within Site 4 and a juvenile Northern Dusky Salamander was captured from under a rock within a stream in Site 10 on 11 June. Ten Northern Dusky Salamanders, a mix of juveniles and adults, were captured from under rocks in a creek in Site 3 East on 12 June and were photographed. All of the Northern Dusky Salamanders captured on 11 & 12 June appeared to be healthy.

6. *Desmognathus monticola* (Seal Salamander) One adult Seal Salamander was captured in the creek within Site 3 East on 12 June, was photographed and appeared to be healthy.

7. *Eurycea cirrigera* (Southern Two-Lined Salamander) One neonate Southern Two-Lined Salamander was observed under a rock within a creek in Site 4 on 11 June. One adult Southern Two-Lined Salamander was captured in a creek within Site 3 and photographed and another adult was captured from a creek within Site 10 on 11 June. The captured adults appeared to be healthy.

8. *Eurycea l. longicauda* (Long-Tailed Salamander) Six adult Long-Tailed Salamanders were observed and captured from under rocks next to a creek bed and an adult Long-Tailed Salamander was observed under a large piece of tin on a concrete slab within Site 4 on 11 June. Two adult Long-Tailed Salamanders were captured from under rocks on the edge of a field and woods within Site 5 on 11 June. All of the captured Long-Tailed Salamanders from both sites appeared to be healthy.

9. *Eurycea lucifuga* (Cave Salamander) More than 30 Cave Salamanders were found during the survey. Seven Cave Salamanders were observed in caverns within Site 3 on 11 June. Six adult Cave Salamanders were captured about 6-7 meters in from the natural entrance, which is above the main commercial entrance, of Natural Bridge Caverns. One adult Cave Salamander was observed in a third cavern chamber about 27 to 28 meters (90 feet) from the natural entrance near no other visible opening. Ten or more neonate Cave Salamanders were observed in a cavern pond and four adults and a juvenile Cave Salamander were found under rocks all near the main cavern entrance within Site 8 on 11 June. All of the captured Cave Salamanders appeared to be healthy. Two adult Cave Salamanders were observed in a cave off the trail within Site 3 West on 12 June.

10. *Notophthalmus v. viridescens* (Red-Spotted Newt) Two juvenile Red-Spotted Newts (Red Efts) were captured in a forest area within Site 7 on 11 June and appeared to

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be healthy. Two Red Efts were observed within Site 3 West on 12 June. One was located just off the trail and the other was under a log. All four specimens appeared to be healthy.

11. *Plethodon cinereus* (Eastern Red-Backed Salamander) One adult Eastern Red-Backed Salamander was observed under a piece of large tin resting on a concrete slab, the same tin that covered a Long-tailed Salamander, in Site 4 on 11 June.

12. *Plethodon cylindraceus* (White-Spotted Slimy Salamander) One adult White-Spotted Slimy Salamander was captured from under a rock in the woods near a ravine within Site 4 and a juvenile White-Spotted Slimy Salamander was observed near the natural entrance to Natural Bridge Caverns within Site 8 on 11 June. Both specimens appeared to be healthy.

13. *Plethodon hoffmani* (Valley and Ridge Salamander) Two adult Valley and Ridge Salamanders were captured inside but close to the natural entrance of Natural Bridge Caverns within Site 8 on 11 June. These specimens appeared to be healthy. However, neither specimen could be positively identified during the survey. A later DNA analysis of tail clips confirmed the species identification of these specimens as *Plethodon hoffmani*.

Reptiles

14. *Agkistrodon contortrix* (Eastern Copperhead) One adult Eastern Copperhead was observed coiled on a rocky pile within Site 5 on 11 June.

15. *Carphophis a. amoenus* (Eastern Wormsnake) One adult Eastern Wormsnake was observed under a rock within Site 10 on 11 June. One juvenile and an adult Eastern Wormsnake were captured under rocks along the trail within Site 3 East on 12 June. The

captured individuals appeared to be healthy.

16. *Coluber c. constrictor* (Northern Black Racer) One adult Northern Black Racer was observed in an abandoned agricultural field and another was observed basking on a rock near a creek close to Foamhenge within Site 5 on 11 June. One adult Northern Black Racer was observed basking and then crossing the trail within Site 3 East on 12 June.

17. *Diadophis punctatus edwardsii* (Northern Ring-Necked Snake) One adult Northern Ring-Necked Snake was captured under a brick in a poorly maintained shed within Site 1 on 11 June. This snake was photographed and appeared to be healthy.

18. *Lampropeltis t. triangulum* (Eastern Milksnake) One adult Eastern Milksnake was captured under a deep debris pile on 11 June within Site 1. This snake was captured, photographed and retained for group demonstration. This specimen appeared healthy and was released in the late afternoon of 11 June at the debris pile.



19. *Nerodia s. sipedon* (Northern Watersnake) On 11 June, 1 adult Northern Watersnake was captured while swimming in a creek within Site 4. One juvenile Northern Watersnake was observed basking on a rock within a creek near a bridge within Site 5 and another juvenile was observed basking on a rock near the Natural Bridge arch within Site 10. On 12 June in Site 3 West 1 juvenile Northern Watersnake was observed on a log/wood pile in a creek near a cave and

another juvenile Northern Watersnake was observed basking on top of a high wall. An adult gravid female Northern Watersnake was captured near Cedar Creek Trail and a second adult Northern Watersnake was observed in a crevice in a concrete bridge spanning a creek. The captured adult appeared to be healthy.

20. *Pantherophis alleganiensis* (Eastern Ratsnake) On 11 June, one large adult Eastern Ratsnake was observed beneath a tree within Site 3 and was captured. This individual was retained until the end of the 11 June survey, for group observation and measurement. This specimen had an overall length of approximately 180 cm (5.9 feet) and was later released where it was captured. On 11 June the shed skin of an adult Eastern Ratsnake was found on the side of a road within Site 4 and an adult Eastern Ratsnake was observed alongside a creek within Site 5. On 12 June, a juvenile Eastern Ratsnake was captured at the base of a tree near the creek in Site 3 West and 2 adults were captured and photographed in Site 3 East. The first larger adult Eastern Ratsnake was caught while basking on the window sill of a barn and appeared to be healthy. The second smaller adult Eastern Ratsnake was found under a bell behind a greenhouse and had some older scale wounds.

21. *Regina septemvittata* (Queensnake) On 11 June, within Site 3, an adult Queensnake was captured on a branch in a creek, was photographed and appeared to be healthy. A second adult Queensnake was observed basking on a rock within a creek. A third adult was observed in the water and appeared to be somewhat disfigured. Photographs were taken of the disfigured adult. A fourth adult Queensnake was observed and photographed basking in a grassy area by the bank of a creek. Within Site 4, a deceased Queensnake was found in the grass near water. Within Site 10 an adult Queensnake was captured in brush near Natural Bridge

was photographed and appeared to be healthy. On 12 June 2 adult Queensnakes were observed basking within vegetation next to a creek within Site 3 West. Both adult Queensnakes appeared to be healthy.

22. *Thamnophis s. sirtalis* (Eastern Gartersnake) One juvenile Eastern Gartersnake was captured in thick underbrush near a creek in a ravine within Site 4 on 11 June. This specimen appeared to be healthy.

23. *Chelydra serpentina* (Snapping Turtle) An adult Snapping turtle was observed in a creek within Site 1 and a juvenile Snapping Turtle was observed and captured in a creek near Natural Bridge within Site 10 on 11 June. The captured juvenile Snapping Turtle appeared to be healthy. An adult Snapping Turtle was observed in a pond near the café within Site 3 West on 12 June.

24. *Terrapene c. carolina* (Woodland Box Turtle) Eighteen Woodland Box Turtles were documented during the survey and at least one individual was recorded in each survey site. On 11 June, an adult female Woodland Box Turtle was captured crossing the road and was photographed and an adult male Woodland Box Turtle was captured in the woods on a bluff above a creek in Site 1. Both specimens appeared to be healthy. In Site 3 the shell of a deceased Woodland Box Turtle was observed in a debris pile on the bank of a creek. In Site 4 two adult male Woodland Box Turtles were captured near each other facing uphill in a dry creek bed. Two adult Woodland Box Turtles were found in leaf litter in a ravine. These 4 specimens appeared to be healthy. Another Woodland Box Turtle was observed in leaf litter and dirt near a creek. In Site 5 one adult male Woodland Box Turtle was captured in a meadow and another adult male Woodland Box Turtle was captured in a wooded area. Two adult male Box Turtles were captured

together on the edge of a field and appeared to be fighting. All 4 adult male specimens appeared to be healthy. One deceased juvenile Woodland Box Turtle was observed next to a log in a field. In Site 7, one adult male Woodland Box Turtle was captured in the forest and its top marginal scute was missing. In Site 8 one adult male Woodland Box Turtle was captured in leaf litter and appeared to be healthy. In Site 10 one adult Woodland Box Turtle was captured next to a log beside the trail behind some caverns. On 12 June, in Site 3 East a deceased adult Woodland Box Turtle was found on the trail and a healthy juvenile Woodland Box Turtle was captured and photographed.

25. *Plestiodon fasciatus* (Common Five-Lined Skink) On 11 June, an adult Common Five-Lined Skink was observed on a tree within Site 3. One juvenile Common Five-Lined Skink was captured under a concrete rock near the wax museum within Site 4. One adult Common Five-Lined Skink was observed within Site 8 near the caverns. On 12 June, in Site 3 West, a juvenile Common Five-Lined Skink was observed on a concrete walkway over Cedar Creek.

26. *Sceloporus undulatus* (Eastern Fence Lizard) On 11 June, an adult Eastern Fence Lizard was observed on a tree near a turkey nest within Site 1 and an adult Eastern Fence Lizard was observed on the side of the trail within Site 5. On 12 June in Site 3 East an Eastern Fence Lizard was observed basking on a wood pile.

DISCUSSION

During the two day survey of “NBP”, the VHS survey groups positively identified more than 139 specimens representing twenty six species (Table 3). There were 13 species of amphibians (4 frogs and 9 salamanders) and 13 species of reptiles (9 snakes, 2 turtles and 2 lizards). However there may be some redundancy in the

specimen counts from Site 3 which was surveyed by one survey group on 11 June and the same area by two other survey groups on 12 June, one focused on the east end and the other focused on the west end of Site 3. One species, *Plethodon hoffmani*, could not be positively identified during the survey but DNA testing of tail clips confirmed the species. All of the species encountered had been previously documented in Rockbridge County.

The number of specimens documented is low for a two day survey with a large volunteer participation but is most likely due to the very hot weather conditions encountered during the survey. Salamanders were the most frequently encountered animals during the survey with more than 64 observations, including more than 30 *Eurycea lucifuga*. Snakes were the most frequently encountered reptiles with 31 observations, including eight *Regina septemvittata*. *Terrapene c. carolina* was the most frequently encountered reptile species with 18 observations.

Some of the common amphibian and reptile species previously documented for Rockbridge County that were not encountered include *Ambystoma maculatum* (Spotted Salamander), *Ambystoma opacum* (Marbled Salamander), *Anaxyrus fowleri* (Fowler’s Toad), *Chrysemys p. picta* (Eastern Painted Turtle), *Eurycea guttolineata* (Three-Lined Salamander), *Lithobates palustris* (Pickerel Frog), *Opheodrys a. aestivus* (Northern Rough Greensnake) and *Pseudacris crucifer* (Spring Peeper).

All 30 observations of *E. lucifuga* were in caves and caverns with some under rocks. More than 10 neonates were observed in a cavern pond near the main cavern entrance. Six individuals were observed approximately six to seven meters in from the entrance. However, one adult was observed within the third chamber of a cavern in Site 3 about 27 to 28 meters (90 feet) from the entrance. There

were no other visible openings in the vicinity of this specimen. Conant et. al. (1998) reports that a favorite habitat for *E. lucifuga* is in the twilight zone of caves, where light is weak. These salamanders are excellent climbers and move about on the formations and ledges. The twilight zone area of a cave is the area just inside the entrance where there is some light, but not enough for plants to grow (Fawley 2002). They also occur outside of caves and may be discovered beneath logs, stones and debris in wooded or fairly open spaces. Beane et. al. (2010) reports *E. lucifuga* may occur near springs and along rocky brooks under rocks and stones during wet periods. No observations were made outside the caves and caverns during the survey.

Of the species encountered only *P. hoffmani* has a distribution range which is limited primarily to the Valley and Ridge physiographic province. Beane et. al. (2010) reported that the distribution range of *P. hoffmani* in Virginia is north of the New River to Rockingham County.

Eighteen *T. c. carolina* specimens were observed during the survey and were present in every zone surveyed. Group leaders identified the sex of 10 individuals, 9 of which were male with only 1 female identified. Mitchell (1994) cites two Virginia distribution studies for Woodland Box Turtles with sex ratios of 1 male to 2 females among 255 individuals sampled in a mixed hardwood forest in Prince William County and sex ratios of 1.2 males to 1 female, among 50 individuals that were sampled in an open field, hardwood forest and marsh in Fairfax County. It is unclear why only 1 female Woodland Box Turtle was identified during the survey.

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