

A Herpetological Survey of The Quarry Gardens in Schuyler, Virginia

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Introduction

The Virginia Herpetological Society (VHS) Quarry Gardens Survey was held at the Quarry Gardens in Schuyler, Virginia on 4 June 2016. This was the first herpetological survey conducted on the grounds (Bernice Thieblot, pers comm). The Gardens are located in Nelson County and there are several different types of habitat on the grounds: rocky outcrops, boggy meadows, springs, seepages, and forested hillsides. The variety of habitats makes it an ideal place to survey for local herpetofauna. The Quarry Gardens is comprised of 242.8 hectares (ha) with 16.2 ha around the native plant gardens and 21.4 kilometers (km) of trails. In the 1920's a soapstone processing plant was located in Schuyler, Virginia. Five of these quarry pits are the center of what is now The Quarry Gardens at Schuyler (Smith, 2015). In 1990 the land became privately owned and currently exists to: preserve and exhibit relics of the soapstone quarrying industry, assist the natural process of plant and habitat restoration, showcase native plant communities for public education and enjoyment, and maintain records of plants and animals as a resource for study.

The Quarry Gardens in Schuyler, Virginia is located on the edge of the Piedmont and Blue Ridge Provinces of Virginia (Mitchell and Reay, 1999) at 150 meters (m) elevation. Characteristics of the Piedmont Province is the presence of metamorphic rocks, like soapstone, and elevations of up to 90 m (Tobey, 1985). The Blue Ridge Province predominantly has igneous and metamorphic rocks and elevations ranging from 30 m to as high as 1,000 m (Thomas, 2010). The section of Nelson County that was surveyed is a southeastern mixed forest with plains and low mountains (Mitchell and Reay, 1999). The basic, upland soils found around the area support oak-hickory forests (Fleming, 2016). Although the Quarry Gardens is technically located in the Piedmont Province which is known for its poorly draining loamy or clay-like soils (Thomas, 2010), the soil at the Gardens is a magnesium-rich, alkaline soil (Smith, 2015). This magnesium-alkaline soil is more typical of soils in the mountainous areas of Virginia (Fleming, 2016). This makes the soil at the Quarry Gardens a unique soil-type for the area. Usually alkaline soil is present in soils near weathered carbonate formations such as limestone (Fleming, 2016) or in the case of the Quarry Gardens due to the soapstone that was mined on the grounds.

Study Sites

There were three study sites (see Figure 1 for survey areas)

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Site 1 (37°46'43"N, 78°42'27"W)

This site was around the main quarry gardens. The two paths hugged the large quarry ponds and also had a mixture of rocky outcrops, springs, streams, and upland mixed hardwood forests.

Site 2 (37°46'47"N, 78°42'52"W)

This site was off a dirt road that had a mix of springs, ponds, upland mixed hardwood forests, and rhododendron groves.

Site 3 (37°46'59"N, 78°42'43"W)

This site was up the road from site 2 and had ponds and mixed hardwood forests.

Figure 1. Map showing survey area.



Materials and Methods

On Saturday, 4 June survey participants were divided into 2 groups. Field gear was disinfected before surveying. Methods used to find animals included hand capture, visual observation, listening for calling anurans, and flipping over cover objects. All animals were photographed as voucher specimens and animals with abnormal patterning, signs of disease, or injury were especially noted. Group leaders filled out survey data sheets to record all animals encountered. Group leaders were tasked with recording all observations on standardized recording sheets which included: information on the physical environment, weather, animal health, and microhabitat. Other data collected included morphometric measurements of rare species, age, and sex. Data forms and digital photos of new county records from this survey were deposited into the VHS archives. Site 1 was surveyed in the morning from 0850hr – 1200hr. Sites 2 and 3 were surveyed

in the afternoon from 1300hr – 1500hr (see Table 1 for amount of survey effort expended at each site).

Table 1: The amount of survey effort per site for the 2016 Quarry Survey.

	Site 1	Site 2	Site 3	Total
Number of Surveyors	15	5	6	-
Hours Surveyed	3.25	2.0	2.0	-
Person Hours of Survey effort	48.75	10.0	12.0	70.75

Results

A total of 15 volunteers met at the Quarry Gardens on Saturday, 4 June 2016. Over 60 individual animals of 17 different species of herpetofauna were documented during this survey (see Table 2).

There were a few noteworthy finds. Several *Scincella lateralis* (Little Brown Skink) were observed; this is the first vouchered record of this species for Nelson County, Virginia. Additionally, one *Eurycea guttolineata* (Three-lined Salamander) was observed. This is the first time *E. guttolineata* has been documented in Nelson County. On the pre-survey, conducted Saturday, 28 May 2016, what appeared to be an amelanistic *Anaxyrus americanus americanus* (American Toad) was observed at site 2. This individual is not reflected on the tally below.

Table 2. Summary of the number of amphibians and reptiles observed at each site.

Sites	1	2	3	Total
<u>Amphibians</u>				
<i>Acris crepitans</i>	11		6	17
<i>Anaxyrus americanus americanus</i>	1			1
<i>Anaxyrus fowleri</i>	2			2
<i>Desmognathus fuscus</i>		1		1
<i>Eurycea guttolineata</i>		1		1
<i>Hyla versicolor</i>	1		1	2
<i>Lithobates catesbeianus</i>	1	6		7
<i>Lithobates clamitans</i>	4		4	8
<i>Notophthalmus viridescens viridescens</i>	3	1		4
<u>Reptiles</u>				
<i>Carphophis amoenus amoenus</i>	1			1
<i>Diadophis punctatus</i>	1	1		2
<i>Pantherophis alleghaniensis</i>	1		2	3

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<i>Plestiodon faciatus</i>	4			4
<i>Pseudemys concinna concinna</i>	1			1
<i>Sceloperus undulatus</i>	5			5
<i>Scincella lateralis</i>	3			3
<i>Terrapene carolina carolina</i>	2	1	1	4
Total:	41	11	14	66

Annotated Checklist

Amphibians

1. *Acris crepitans* (Northern Cricket Frog)
Cricket Frogs were found on the periphery of the pond habitats at both sites 1 and 3. Eggs were also observed at site 1 in puddles and shallow drainage areas. Adult males were calling at site 1.

2. *Anaxyrus americanus americanus* (American Toad)
A single juvenile American Toad was observed at site 1 under a rock in a woodland habitat. What appeared to be an amelanistic individual was observed the weekend before, during the pre-survey at site 2 in tall grass next to a forest. It is pictured below with an *Anaxyrus fowleri* found beside it for color reference.



3. *Anaxyrus fowleri* (Fowler's Toad)
Two Fowler's Toads were observed, one juvenile and one adult. Both were under cover objects in an upland forest at site 1.

4. *Desmognathus fuscus* (Northern Dusky Salamander)
A single adult Northern Dusky Salamander was observed at site 2 under a log on the edge of a seep.

5. *Eurycea guttolineata* (Three-lined Salamander)

A single sub-adult Three-lined Salamander was found upstream of the Dusky Salamander at site 2 under a log on the edge of a seep that led to a larger body of water.



6. *Hyla versicolor* (Gray Treefrog)

Two adult Gray Treefrogs were observed. One was at site 1 sleeping and tucked away on a tree branch overhanging one of the quarry ponds, the other was calling at site 3.

7. *Lithobates catesbeianus* (American Bullfrog)

Seven American Bullfrogs were observed. A single adult was found at site 1 in the mouth of a stream in shallow water. Six juveniles were observed at site 2 at the edge of a pond.

8. *Lithobates clamitans* (Green Frog)

Approximately eight Green Frogs were observed at both sites 1 and 3. At site 1 auditory observations of four males calling was noted. Four adults were seen at site 3 on the bank of a canal.

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

Four Red-spotted Newts were observed in the juvenile eft stage, three at site 1 and one individual at site 2. The three at site 1 were in an upland forest habitat and the one at site 2 was on a hillside leading to a seep. During the pre-survey an eft that was transitioning to an adult was noted at site 1 in a shallow puddle. It had the coloration of both the eft (dorsal) and adult form (ventral) (pictured below).



Reptiles

10. *Carphophis amoenus amoenus* (Eastern Wormsnake)

One Wormsnake was noted under a cover object at site 1 on the path around the Quarry Pond.

11. *Diadophis punctatus edwardsii* (Northern Ring-necked Snake)

Two Northern Ring-necked Snakes were observed under logs at sites 1 and 2. At site 1 it was in an upland habitat and at site 2 it was in a lowland habitat not too far from a seep. Both had a complete “ring” around their necks.



12. *Pantherophis alleghaniensis* (Eastern Ratsnake)

Three Eastern Ratsnakes were observed, one individual at site 1 and two at site 3. The two individuals at site 3 were sunning on the forest floor. One of the individuals at site 3 had a lot of healed scars on its body.

13. *Plestiodon faciatus* (Common Five-lined Skink)

Four Common Five-lined Skinks were noted at site 1 in a large rock pile/outcrop with lots of basking spots. They were observed either basking on the rocks or seeking refuge under the rocks.



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

One adult River Cooter was seen swimming in the Quarry Pond at site 1.

15. *Sceloporus undulates* (Eastern Fence Lizard)

Five Eastern Fence Lizards were observed at site 1. One was found under a log in an upland forest habitat. The rest were observed basking on rocky outcrops.

16. *Scincella lateralis* (Little Brown Skink)

Three Little Brown Skinks were observed at site 1. The first individual was found in a grassy floodplain under a log. The other individuals were found under rocks next to a large rocky outcrop.

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Discussion

The Quarry Gardens at Schuyler in Nelson County, Virginia was an interesting place to do a herpetological survey. This privately owned land was a soapstone quarry from the late 1800's up until the mid-1940's. The 243 ha of land has a variety of habitats such as upland forests, rocky outcrops, deep quarry lakes, streams, and grasslands. According to the Virginia Herpetological Society's database for Nelson County, 51 species of herpetofauna have been documented: 28 species of amphibian and 23 species of reptiles (VHS Herp Database). Nelson County has been surveyed once before by the Virginia Herpetological Society back in 18-19 May 2001 (Gibson, 2002). This survey covered two different counties in Virginia, Augusta and Nelson Counties. The survey in Nelson County was at Humpback Rocks in the northern, mountainous area of the county at an elevation of 1,021 meters. One amphibian and two reptile species were found: *Notophthalmus viridescens viridescens* (Red-spotted Newt), *Crotalus horridus horridus* (Timber Rattlesnake), and *Storeria occipitomaculata occipitomaculata* (Red-bellied Snake).

E.R. Dunn also surveyed Nelson County for herpetofauna more than 100 years ago in the summers of 1912 - 1914 (Dunn, 1915). Dunn found 33 species of herpetofauna, eight species of amphibians and 25 species of reptiles along the James River (Dunn, 1915). It is interesting to note that four species he found currently have not been documented in Nelson County: *Virginia valeriae valeriae* (Smooth Earthsnake), *Aspidoscelis sexlineata sexlineata* (Six-lined Racerunner), *Kinosternon subrubrum subrubrum* (Eastern Mud Turtle), and *Pseudemys rubriventris* (Northern Red-bellied Cooter); currently the latter is found to the northwest of Nelson County in Augusta County and Waynesboro City (VHS database). The rest are assumed to be in Nelson County. It should also be mentioned that Dunn listed Nelson County as being 64.4 km below Lynchburg (Dunn, 1915), currently Nelson County is 25.6 km northeast of Lynchburg. It is possible that county lines or locations have changed over time.

The Quarry Gardens surveyed a different area than what was previously covered in Nelson County. The Gardens are located in the eastern side of the county at a lower elevation, 150

meters. During the survey conducted on 8 June 2016, 17 species of herpetofauna were documented: nine species of amphibians and eight species of reptiles. Species that we hoped to find were *Opheodrys vernalis* (Smooth Greensnake) which had been found on site before on 11 July 2015 (Devin Floyd pers comm), but not documented as a county record. Since no specimens were found during the survey Devin agreed to submit a note to Catesbeiana (Floyd, 2017).

An individual *E. guttolineata* was found on the bank of a stream at site 2. *Eurycea guttolineata* had not been documented in Nelson County before and this served as a new county record for the species. It was entered into the VHS archives as #427. *Eurycea guttolineata* is found in three counties surrounding Nelson County: Amherst to the southwest, Rockbridge to the west, and Albemarle to the northeast (VHS database). A few *S. lateralis* were also found during this survey which was the second documentation of this species in Nelson County. The first report was by Tom Akre on 2 July 2015 (pers comm), but a voucher was never submitted. The present survey serves as the first voucher, and was entered into the VHS archives as #421. *Scincella lateralis* is thought to be found in counties surrounding Nelson County, but has only been confirmed in Amherst County to the southwest (VHS database). The possible amelanistic *A. a. americanus* that was found during the pre-survey is not common in Virginia (Joe Mitchell, pers comm) and may not have been documented yet in the state. Ongoing research will determine the prevalence of this color abnormality in the United States (Neff et al, in prep).

There are 12 species of herpetofauna, many of which are common species encountered in Virginia and found in nearby counties, but have not yet been confirmed in Nelson County (VHS database). We hoped to encounter some of these species during the survey, but failed to do so. Of these 12 species, two are turtles that have not been documented before: *Sternotherus odoratus* (Eastern Musk Turtle) and *Kinosternon subrubrum subrubrum* (Eastern Mud Turtle). *Sternotherus odoratus* is found north of Nelson County in Albemarle County and to the south in Amherst County (VHS database). *Kinosternon s. subrubrum* is assumed to be found in Nelson County and nearby counties, but has only been documented in Buckingham County to the southeast (VHS database). Both of these turtles prefer shallow, fresh-water pools with vegetation (Martof et al, 1980) which was habitat present at the Quarry Gardens at sites 1, 2, and 3. There are two species of snakes that are assumed to be in Nelson County, but have not been documented yet. *Lampropeltis getula* (Eastern Kingsnake) is found in three counties surrounding Nelson County: Augusta and Albemarle to the north and Buckingham to the east (VHS database). *Lampropeltis getula* is found around woodland areas and under cover objects and sometimes moist areas like swamps and wetlands (Linzey and Clifford, 1981) all of these habitats were present at the sites 1, 2, and 3. *Virginia valeriae valeriae* (Eastern Smooth Earthsnake) is assumed to be found in Nelson County and the counties surrounding it, but has not been documented yet. The closest *V. v. valeriae* has been found to Nelson County is Fluvanna County, 37.1 km to the east and the City of Lynchburg, 67.4 km to the southwest (VHS database). These snakes are seldom seen and are fossorial unless heavy rains bring them to the surface, then they can be encountered under rocks and logs (Linzey and Clifford, 1981). This habitat was seen at all of the sites at the Quarry Gardens.

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There are three salamander species that could be found in Nelson County that have not been documented yet: *Eurycea lucifuga* (Cave Salamander), *Hemidactylium scutatum* (Four-toed Salamander), and *Pseudotriton montanus montanus* (Eastern Mud Salamander). *Eurycea lucifuga* is found in Rockbridge County, to the west of Nelson County, and Amherst to the south (VHS database). *Eurycea lucifuga* is usually restricted to limestone caves, but can be found nearby under rocks next to streams during heavy rains (Martof et al, 1980). While there are no known caves at the Quarry Gardens, suitable habitat exists in other parts of Nelson County. *Hemidactylium scutatum* is assumed to be found state-wide, but has not been documented in Nelson County yet. They are found in Appomattox, Amherst, and Buckingham Counties to the south and Augusta County to the northwest (VHS database). *Hemidactylium scutatum* is found near slow moving seeps and moist upland woodlands with wet logs and leaf litter; they are sometimes associated with sphagnum ponds or bogs which are used as egg laying sites (Mitchell and Gibbons, 2010). *Pseudotriton m. montanus* is found in Augusta County to the west of Nelson County, but none of the other surrounding counties, although its presence is assumed (VHS database). Augusta represents one of the westernmost counties in its range in Virginia and Nelson County would bridge the gap to its range in the eastern part of the state. Other than Augusta, the closest county to Nelson where *P. m. montanus* has been confirmed is Goochland County, 66.4 km to the east (VHS database). The preferred habitat of *P. m. montanus* is muddy, leaf-filled seeps and springs (Petranka, 1998), which is present at site 2.

Four lizard species are assumed to be in Nelson County, but have not been officially documented. They are: *Aspidoscelis sexlineata sexlineata* (Eastern Six-lined Racerunner), *Plestiodon anthracinus anthracinus* (Northern Coal Skink), *Plestiodon inexpectatus* (Southeastern Five-lined Skink), and *Plestiodon laticeps* (Broad-headed Skink). *Aspidoscelis s. sexlineata* is found in three counties around Nelson County: north in Augusta, northeast in Albemarle, and south in Appomattox. *Plestiodon a. anthracinus* is documented in three counties surrounding Nelson County: Augusta and Albemarle to the north and Rockbridge County to the west (VHS database). *Plestiodon inexpectatus* is assumed to be in Nelson County and the surrounding counties, but has yet to be documented in any of them. The closest voucher is two counties to the southeast in Cumberland County and two counties to the southwest in Botetourt County (VHS database). *Plestiodon laticeps* is found in three counties surrounding Nelson County: Rockbridge to the west, Albemarle to the north, and Buckingham to the east (VHS database). All of the aforementioned lizards are usually found under brush, logs, and rocks, and can be seen basking during the day (Mitchell, 1994). Several *P. faciatus* were found onsite and share similar habitat preferences with the four aforementioned lizard species, it can be inferred that those lizards can also exist at the Quarry Gardens.

Although this was a smaller survey in regards to the number of volunteers surveying, when compared to the HerpBlitz or Annual Survey, it was still surprising not to find some common species. Further surveys in Nelson County, Virginia will most likely yield these “hidden” species.

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