

**Eleventh Annual HerpBlitz:
Survey of Reptiles and Amphibians at Stewarts Creek Wildlife
Management Area, Carroll County, Virginia**

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Introduction

Stewarts Creek Wildlife Management Area (SCWMA) is located just off the Blue Ridge Parkway in Carroll County, Virginia, about 11 km (7 mi) southeast of Galax. Carroll County lies within the southern end of the Blue Ridge Physiographic Province. It consists of steep sided valleys with mountain streams at the bottom, the hillsides often covered by Rhododendron thickets. Most of the WMA (99%) is forested, with Tulip Poplar (*Liriodendron tulipifera*) and Yellow Birch (*Betula alleghaniensis*) at the lower elevations and Oak (*Quercus rubra* and *Q. alba*) and various species of Hickory (*Carya*) at higher elevations. The elevation ranges from 480m (1580 ft) at the lower parking lot to 910m (2995 ft) near the upper lot close to the Blue Ridge Parkway.

The WMA was purchased in 1988 and is named for the North and South Forks of Stewarts Creek which traverse and merge within it. There are 7.7 km (4.8 mi) of streams which provide one of the main attractions, native Brook Trout fishing. The streams begin in the higher elevations in the mountains and flow through the WMA carving deep pools and numerous cascades containing large populations of “Brookies”. This species, and the more recently documented Federally threatened Northern Long-eared Bat are the current focus of management efforts.

Stewarts Creek Wildlife Management Area consists of 440 ha (1087 acres) in the mountains of southwestern Virginia where many rare and endemic salamanders occur. The management plan for SCWMA states that little is known of the game or nongame fauna, surveys not having been performed; and called for volunteer groups to be recruited for the first basic surveys (Bassinger et al., 2016). The plan listed 13 tiered species likely to occur in Carroll County, which included three herps (the Hellbender, Bog Turtle and Timber Rattlesnake) with only the Timber Rattlesnake actually documented. None of the high-elevation endemic salamanders are included in that list. Since the WMA has not previously had a survey of amphibians and reptiles, the information gained could prove useful to the management of the WMA for these tiered species if they can be documented.

Stewarts Creek Wildlife Management Area was also selected for its special location in Virginia. Biogeographically, the site is interesting because it is part of the Yadkin - Pee Dee River watershed. The Stewarts Creek watershed carries water all the way to South Carolina. Over the eons of time, this watershed basin could have been used as a corridor for the contraction and expansion of species' ranges as the temperature of this region cooled and warmed. The HerpBlitz

committee thought this area might contain relict communities or perhaps some faunal surprises, being this is the only location in Virginia included within this drainage system. This report documents the eleventh annual HerpBlitz survey held on 28-29 May 2016 at Stewarts Creek Wildlife Management Area.

Study Sites

Upper Access:

This area consisted of upland hardwood forest with rolling hills and sometimes steep ravines. Dominant trees included White Oak, Rhododendron, White Pine, Cucumber Magnolia, Tulip Poplar, Black Locust, Chestnut Oak, Eastern Hemlock and Red Maple. The understory included Ferns, Greenbrier, May Apple and Wild Rose.

Site 1. (N 36° 35' 43.6"; W 80° 48' 11.4") In a tributary to the South Fork of Stewarts Creek, and the floodplain on either side of the creek. There was hardwood forest throughout the area, including some Rhododendron thickets.

Site 2. (N 36° 35' 31.2", W 80° 48' 14.5") In the South Fork of Stewarts Creek and the shore on both sides. Rhododendron lined both banks, with some Ferns.

Site 3. (N 36° 35' 49.8", W 80° 47' 46.9") Upland mixed hardwood and pine forest to the east of the upper access parking lot. Extensive tracts of White Pine with patches of Rhododendron interspersed. Some tracks of hardwoods were included.

Site 4. (N 36° 30' 0.07", W 80° 48' 24.81") A ravine to the north of the upper access parking area. Hardwood forest with a Fern and Greenbrier understory. A Rhododendron thicket lined the east slope. There was a small tributary to the North Fork of Stewarts Creek at the bottom end of the ravine.

Lower Access:

This area included the floodplain of Stewarts Creek. The dominant tree is mostly Tulip Poplar with some Red Oak, Hickory, American Sycamore, White Pine, and several dead Eastern Hemlocks. A small Rhododendron thicket occurred on one slope. The understory consisted of extensive patches of Stinging Nettle, some Eastern Redbud, Raspberry, Wild Rose, Virginia Creeper, and Spicebush.

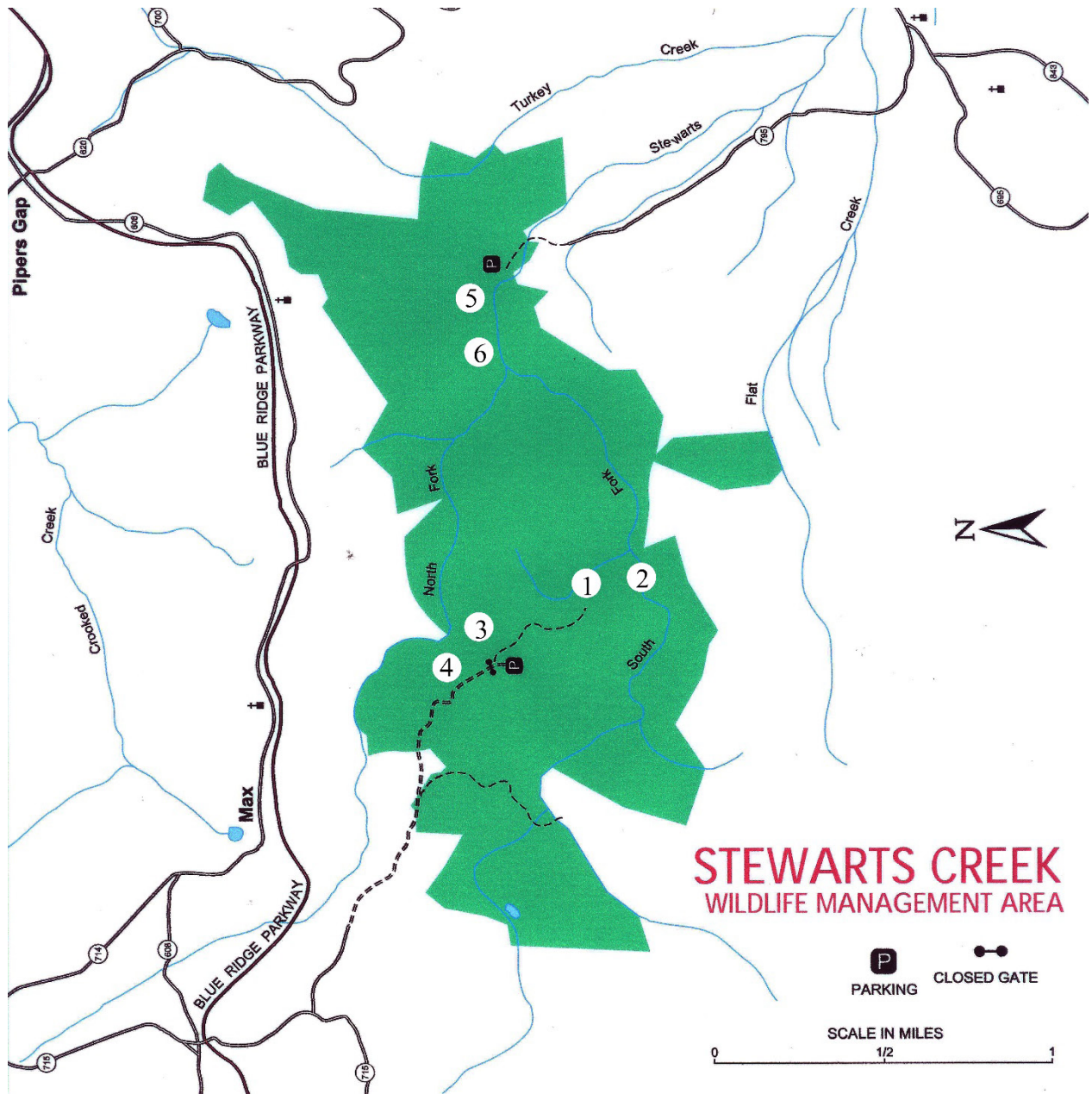
Site 5. (36° 35' 50.4", W 80° 46' 53.11) A small unnamed tributary to Stewarts Creek, including some terrestrial areas in the floodplain of the stream. The stream bed consisted of rock and some gravel.

Site 6. (36° 35' 53.4", 80° 47' 04.96") A smaller unnamed tributary to Stewarts creek, including the floodplain of the stream. The stream bed again consisted of mostly rock with some sand and gravel.

Site 7. Road running in Carroll County, south of US 58 and north of the Blue Ridge Parkway; primarily along Co. Rt. 712 west of Co. Rt. 620 and east of Co. Rt. 713.

Stewart's Creek WMA Survey

Figure 1. Map showing survey sites



Materials and Methods

Upon arriving in the morning, all participants were put through the VHS disinfection protocol. All boots and equipment were dipped in a bleach solution. After disinfection, participants were briefed on safety precautions and on proper methods of rolling logs and rocks and replacing them. Volunteers for this survey utilized a wide variety of collecting methods including flipping logs and rocks, hand capture, visual observation, dipnetting, and listening for calling anurans. For two nights some survey members cruised roads in the county looking for live and road killed animals and listening for calling anurans. Each animal collected was inspected for abnormalities such as parasites, disease, injuries, or malformations. All animals were immediately released at the site of capture. Digital photos and digital audio recordings were collected to voucher any county records or any abnormalities. The group leader recorded all observations on standard VHS data collecting forms. These forms and relevant digital photos have been placed in the VHS physical and digital archives. See Table 1 for the amount of survey effort given to each collecting site.

Table 1. Collecting effort per site at the VHS Stewart's Creek Wildlife Management Area Survey, 28-29 May 2016

Site	1	2	3	4	5	6	7
Number of surveyors	9	9	9	9	4	4	3
Hours surveyed	1.0	0.75	1.25	0.5	1.75	0.75	2
Person hours of survey effort	9.0	6.75	11.25	4.5	3.0	1.5	6

Results

A total of 16 species were found during the weekend survey. Of these there were 13 amphibian species (four anurans and nine salamanders) and three reptile species (one turtle and two snakes). All combined 114 animals were collected from the seven sites investigated. Two county records, *Anaxyrus a. americanus* and *Pseudacris crucifer* were found during the survey. Voucher digital photos and audio recordings have been submitted to the VHS digital archives (#417, 418). Table 2 summarizes the species, number of animals observed, and totals found at each survey site.

Table 2. List of individuals found at each site, with totals, from Stewarts Creek Wildlife Management Area 28-29 May 2016. C=Calling Males.

Species	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Total
Reptiles								
Snakes								
<i>Diadophis punctatus edwardsii</i>	3		1				2	6
<i>Thamnophis s. sirtalis</i>	2		1					3
Turtles								
<i>Terrapene c. carolina</i>							1	1

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Anurans								
<i>Anaxyrus a. americanus</i>	1						1	2
<i>Anaxyrus fowleri</i>							1	1
<i>Lithobates palustris</i>	1				1			2
<i>Pseudacris crucifer</i>							2C	2
Salamanders								
<i>Desmognathus fuscus</i>	2	2						4
<i>Desmognathus orestes</i>	2							2
<i>Desmognathus monticola</i>	6	4		6	12	7		35
<i>Desmognathus quadramaculatus</i>		7			4	1		12
<i>Eurycea wilderae</i>	3	1						4
<i>Gyrinophilus porphyriticus</i>		2						2
<i>Notophthalmus v. viridescens</i>	1			1	2			4
<i>Plethodon cylindraceous</i>	11		3	10		1		25
<i>Plethodon yonahlossee</i>	7		2					9
Totals	39	16	7	17	19	9	4	114

Annotated Checklist

Amphibians:

1. *Anaxyrus a. americanus* (American Toad): Found in sites 1 and 7.

One American Toad was found road cruising on the evening of 27 May. It was on Co. Rt. 620 east of Co. Rt. 712 and west of Co. Rt. 915. Another was found under a rock beside the trail at the Upper Access parking area on 28 May (VHS Archive #418).

2. *Anaxyrus fowleri* (Fowler's Toad): Found in site 7.

One Fowler's Toad was found road cruising on the evening of 27 May, north of the WMA.

3. *Lithobates palustris* (Pickerel Frog): Found in sites 1 and 5.

One Pickerel Frog was found in tall grass by the Upper Access parking area. A juvenile was found under a rock in a small tributary of Stewarts Creek.

4. *Pseudacris crucifer* (Spring Peeper): Found at site 7.

Spring Peepers were heard calling at a variety of sites when road cruising on the evenings of 28 and 29 May. Choruses ranged from a single individual to up to a half dozen males calling. Since there were no previous vouchers in Carroll County for this species (Mitchell and Reay, 1999; FWIS Database), a digital sound recording was made and deposited in the VHS Archive (#417) to verify the occurrence in the county. GPS coordinates for the site at which calls were recorded is N 36° 40' 27.0", W 80° 49' 25.1", on Co. Rt. 712 0.8 km SE of the intersection with Co. Rt. 713.

5. *Desmognathus fuscus* (Northern Dusky Salamander): Found at sites 1 and 2. Northern Dusky Salamanders were found under rocks in the small streams at sites 1 and 2, and under a log about 1m from the stream at site 1. On 12 March 2016 during a planning trip to the property we observed two dusky salamanders fighting. One salamander was biting the head of a second salamander. We filmed this fighting bout for over a minute until the dominant salamander released the subordinate.
6. *Desmognathus monticola* (Seal Salamander): Found at sites 1, 2, 4, 5, and 6. Most Seal Salamanders were found under rocks at the margin of streams at these sites. One was found under the bark of a dead tree in the trail 10 m from the stream at site 1, and another at site 1 was found under a log about 20 m from the stream. One at site 6 was found under leaf litter at the mouth of a small stream.
7. *Desmognathus orestes* (Blue Ridge Dusky Salamander): Found at site 1. Both of the Blue Ridge Dusky Salamanders at site 1 were found under logs, one about a meter from a very small stream, and the other about 20 m from a larger stream.
8. *Desmognathus quadramaculatus* (Black-bellied Salamander): Found at sites 2, 5, and 6. Black-bellied Salamanders were found under rocks along the larger streams at these sites.
9. *Eurycea wilderae* (Blue Ridge Two-lined Salamander): Found at sites 1 and 2. Blue Ridge Two-lined Salamanders were found under logs in the floodplains at sites 1 and 2. They were all small adults, less than a year old.
10. *Gyronephalus porphyriticus* (Northern Spring Salamander): Found at site 2. The one Northern Spring Salamander found in the WMA was under a rock in a relatively dry undercut protected above by a large rock protruding over the undercut area.
11. *Notophthalmus v. viridescens* (Red-spotted Newt): Found at sites 1, 4, and 5. All of the Red-spotted Newts found were in the red eft stage. These newts were found mostly under logs in the floodplains at these sites. One from site 5 was out walking on the forest floor on 29 May, a relatively overcast and rainy morning.
12. *Plethodon cylindraceous* (White-spotted Slimy Salamander): Found at sites 1, 3, 4, and 6. All of the White-spotted Slimy Salamanders were found under logs in the forests at these sites. At least one at site 6 was found under a log where the forest floor litter was composed of pine needles.
13. *Plethodon yonahlossee* (Yonahlossee Salamander): Found at sites 1 and 3. All of the Yonahlossee Salamanders were found under logs, close to *Rhododendron maximum* thickets. The elevation at site 1 was 2630' and for site 3 was 2835'. At site 1 there were 3 adults and 4 juveniles, indicated this was a good, reproducing population.

Reptiles

14. *Terrapene c. carolina* (Woodland Box Turtle): Found at site 7. A road killed Woodland Box Turtle was observed on County Route 696 on the bridge over Stewarts Creek just west of Lambsburg on 27 May while visiting the Lower Access to the WMA prior to the survey.

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15. *Diadophis punctatus edwardsii* (Northern Ring-necked Snake): Found at sites 1, 3, and 7. The Northern Ring-necked Snakes found were usually under bark of dead trees. However, the one at site 3 was a juvenile crossing the trail. The two found road cruising at night were both lying still on the side of the road. One of these vibrated its body when handled, much like a larger snake will sometimes vibrate its tail when cornered or handled. All but one had a full neck band and plain yellow venter, typical of the northern subspecies.. One had small dots down the middle of the belly, more typical of the intergrades between the two subspecies.

16. *Thamnophis s. sirtalis* (Eastern Gartersnake): Found at sites 1 and 3. The two Eastern Gartersnakes found at site 1 were found under rocks. The one at site 3 was coiled up and basking by the side of the trail.

Discussion

The Stewart's Creek Herpblitz documented 16 species of reptiles and amphibians with a total of 114 animals hand captured or observed. This is over half the number of species (31) reported by the VHS Herp Database for Carroll County. Of these species *Anaxyrus a. americanus* and *Pseudacris crucifer* were new county records and three salamander species had Wildlife Action Plan ratings. The species with Wildlife Action Plan ratings include *Desmognathus orestes* (tier IV), *Eurycea wilderae* (tier III), and *Plethodon yonahlossee* (tier IV). Finding *Plethodon yonahlossee* represents a new site not reported by Hoffman (1992) or Ogle (1977). Nine of the 16 species (56%) were salamanders which is not unexpected for a mountainous area in this region. Not one lizard species was collected during the survey and reptiles in general were poorly represented on this property. Anurans were also underrepresented in our survey, but proper habitat for this group is not in abundance at the sites we surveyed.

Our one and a half day survey only sampled a few locations at Stewart's Creek WMA. Future surveys should cover more area and habitat types. As the WMA is developed more fully in the future, greater access to the waterways is one goal of the management plan. This will facilitate future wildlife surveys. Surveying at other times of the year may also yield more species and animals. One location which future survey parties may explore is a pond on the western edge of the property. This site might increase the number of known turtles and anurans. There are many species that may still be found on this property. *Chelydra serpentina* and *Glyptemys muhlenbergii* are turtles already reported for the county. *Chrysemys p. picta*, *Kinosternon s. subrubrum*, and *Sternotherus odoratus* are turtles found in surrounding counties. With more surveying and use of turtle traps in the pond on the western edge of the property, some of these turtles may be found. Anurans which might be added to this site's list include *Hyla chrysoscelis*, *Hyla versicolor*, *Lithobates catesbeianus*, *Lithobates clamitans*, *Lithobates palustris*, *Lithobates sylvaticus*, *Pseudacris brachyphona*, and *Pseudacris feriarum*. With no lizard species being found, this taxon's species list has the greatest potential for being increased. *Plestiodon a. anthracinus*' distribution is still being elucidated, but this species is associated with the Blue Ridge and therefore may be found on this property. Additionally, *Plestiodon fasciatus* and *Sceloporus undulatus* have statewide distributions and *Plestiodon laticeps* is found in the adjoining county to the east. *Scincella lateralis* has an austral distribution, so one would think it might be associated with the Yadkin-Pee Dee drainage and likely to be found at this site. Snakes having statewide distributions including *Agkistrodon c. mokasen*, *Carphophis a. amoenus*, *Coluber c. constrictor*, *Heterodon platirhinos*, *Lampropeltis t. triangulum*, *Nerodia s. sipedon*, *Opheodrys aestivus*, and *Pantherophis alleghaniensis* would be highly likely to be found on this site. *Regina septemvittata* having a western distribution and *Crotalus horridus* being found

in the mountains are also possible future finds. It would not be surprising to also find *Storeria sp.* We did not find the proper habitat for *Ambystoma sp.* salamanders or *Hemidactylium scutatum* but these would be possible for the area if the proper habitat was found on the property. *Plethodon cinereus*, *Plethodon wehrlei*, and *Pseudotriton r. nitidus* are salamanders which should also be sought on the property. The large, clean streams on the property would provide excellent habitat for *Cryptobranchus a. alleganiensis*. It is unlikely that this species resides on the property since the drainage travels south and away from the watershed where Hellbenders are currently found. eDNA sampling is warranted to at least rule out the possibility.

The importance of proper management of this property cannot be overstated by the authors. Finding three tiered species with others that may be found should give property managers pause in logging or other land management practices. One of the goals in the management plans for Stewarts Creek is to ensure that streams stay unsilted so that Brook Trout can flourish (Bassinger et. al, 2016). This management practice goes hand in hand with protecting the Blue Ridge endemic salamanders. They too need clean water and mature forestland in order to thrive. *Plethodon yonahlossee* needs a little more care though. It thrives in mature forests that are not just by streams but that are also found away from streams. We strongly encourage the VDGIF to extensively survey for this species and protect all the habitat in which it is found. In continuing to update management plans for this site it should also be stated that poaching of this species could possibly be a threat. With limited manpower, perhaps strategic placement of trail cameras could be a deterrent. This has already been proposed as a means to monitor the level of trout fishing.

There is a lot left to be discovered at Stewarts Creek Wildlife Management Area but also Carroll County as a whole. The VHS Herp Database reports 31 species of reptiles and amphibians (15 salamanders, five anurans, three turtles, one lizard, and seven snake species) for the entire county. The high elevation sites have been surveyed but low elevation sites have not been given proper attention. There are many county records waiting to be found at low elevations sites around the county.

Literature Cited

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Acknowledgments

We wish to thank the volunteers who came out to western Virginia for this survey. Those volunteers are: Craig Abbott, Tina Altizer, Sydney Brown, David Van Gelder, Jason Gibson, Kyle, Josiah and Emma Harris, Tom Holman, and Paul Sattler.