

Smith Mountain Lake State Park Survey: Scarlet Kingsnake Blitz

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Introduction

Smith Mountain Lake was created in 1960 when Appalachian Power Company began construction of a dam on the Blackwater and Roanoke Rivers in Smith Mountain Gap in Bedford County to generate electricity. The dam was completed in 1966, and in 1967 Appalachian Power donated the first parcel of land for Smith Mountain Lake State Park. Over the next six years, the state bought the rest of the Park's land. The Park itself opened to the public in 1983. Smith Mountain Lake is the second largest body of freshwater in Virginia being 64 km long and 8335 hectares of surface with 800 km of shoreline. The deepest point in the Lake is about 83 meters near the dam, but the average depth is about 18 meters.

Bourassa State Forest is located in Bedford County just north of Smith Mountain Lake. It is a 117 hectare mixed hardwood forest used for timber production, as an outdoor laboratory, wildlife sanctuary and watershed protection. It was a gift to the state.

Smith Mountain Lake State Park and Bourassa State Forest were surveyed from 12-14 June 2009. The site was selected as a likely area in which to find the Scarlet Kingsnake. Roble et al. (2007) reported on a series of 11 juvenile Scarlet Kingsnakes found between 2003 and 2007 just to the east of Smith Mountain Lake State Park and along a road bordering Bourassa State Forest. The Scarlet Kingsnake was recently upgraded from a subspecies of the Eastern Milksnake

(*Lampropeltis triangulum triangulum*) to full specific status (*Lampropeltis elapsoides*) by Pyron and Burbrink (2009). It is one of the rarest and most elusive of the snakes found in Virginia, with this population possibly representing an isolated endemic population. This was the target species for the survey, however, there are no reports of herpetological surveys conducted for either Smith Mountain Lake State Park or Bourassa State Forest, and so these sites were long overdue for basic surveys.

Study Sites

Smith Mountain Lake State Park was divided into three parts due to it consisting of three peninsulas. Bourassa State Forest was divided into two parts due to there being two parking locations. Each site is briefly described below. The GPS coordinates represent one reading taken at a central point at each location. GPS coordinates were obtained from Google Earth.

Site 1: Campground Peninsula – (37° 5' 8.88"N, 79° 35' 39.69"W)

As the site name implies, this peninsula is the location of both cabins and a campground. These areas were off limits to survey but there was plenty of hardwood forest throughout the peninsula. One paved road bisected the peninsula into almost equal halves. This site contains several streams and two vernal ponds (one located near the amphitheater and one across the road from the campground entrance). In the forests there were many piles of rocks and logs.

Site 2: Park Office Peninsula – (37° 5' 33.09"N, 79° 35' 48.18"W)

The Park Office Peninsula is divided into two parts by a paved road leading Northwest to Osprey Point. The site contains mixed pine-hardwood forests with beech, maple, and white oak predominating with pines. Midway out, the peninsula is bisected by White Tail Path. The tip of the peninsula contains the swimming beach which was off-limits to our survey. From the Office, Walton Creek Trail runs up the northern shore. It was along this trail that the survey concentrated its efforts. The trail ran close to the shore of Smith Mountain Lake,

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bisecting many ravines that sloped down to the lake. Only one ravine contained flowing water in an intermittent stream.

Site 3: Visitor Center Peninsula – (37° 5' 10.53"N, 79° 36' 2.92"W)

The Visitor Center Peninsula is divided into two parts by the paved road leading to the visitor center. The site contains mix pine – hardwood forests. The border of the property touches Smith Mountain Lake. One stream is found on the southern portion of this property. Two major hiking trails run the full length of the peninsula and end near the visitor center.

Site 4a: Bourassa State Forest (37° 4' 46.06"N, 79° 31' 22.92"W)

This section of Bourassa State Forest was visited by a small survey group on Friday, 12 June. This portion of the State Forest contains hardwoods with surrounding planted pines. The portion of this site we surveyed did not have any streams or standing water. Tolers Ferry Road borders the property to the north.

Site 4b: Bourassa State Forest (37° 4' 21.11"N, 79° 30' 53.52"W)

The VHS visited this site on 14 June. This portion of the state forest did have a stream which was surrounded by many acres of hardwood forest. Blueberry bushes made up the dominant low ground cover. Tolers Ferry Road borders the property to the northeast and Silver Dollar Lane makes up an eastern boundary. Silver Dollar Lane goes to the highest elevation of the property. At the highest elevation there are many large exposed granitic rocks. Along Silver Dollar Lane there are some debris piles and road rut pools.

Materials and Methods

The Scarlet Kingsnake Blitz began at 1700 hours on 12 June and lasted until 1100 hours 14 June 2009. Groups ranging from 5 to 11 people visited each of the four sites during the survey window (see Table 1). Collecting at each site included visual encounters, road cruising, dipnetting, over turning cover objects, listening for calling anurans, and hand capture. Each animal captured was inspected for

overall health and disease and all observations were documented on data sheets by each team leader. Digital photos and/or digital sound recordings were collected for each species encountered.

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

| | Site 1 | Site 2 | Site 3 | Site 4a | Site 4b |
|--------------|--------|--------|--------|---------|---------|
| No. Persons | 15 | 11 | 23 | 5 | 8 |
| Hrs surveyed | 2.3 | 2.45 | 4 | 1 | 2 |
| Person hours | 34.5 | 26.95 | 92 | 5 | 16 |

Results

The Scarlet Kingsnake Blitz survey yielded no captures or sightings of Scarlet Kingsnakes. Despite this disappointment, 26 species of reptiles and amphibians were documented during the weekend (23 species for Smith Mountain Lake State Park and seven species for Bourassa State Forest). Of the 26 species, seven were anurans, seven were salamanders, two were turtles, two were lizards, and eight were snakes. Table 2 summarizes each species and the numbers of animals observed at each survey site. An annotated checklist follows. Numbers in brackets denote the survey sites where each species was documented.

Annotated Checklist

Amphibians

1. *Acris crepitans* (Northern Cricket Frog) –

At least 20 Northern Cricket Frogs were found, but only at a farm pond just outside the park boundaries (37° 6' 14.67" N, 79° 34' 55.20" W). During road cruising on Saturday night, a large chorus of males was heard at this pond.

2. *Anaxyrus americanus* (American Toad) – [1, 2, 4a]

The American Toad was the only toad found during the weekend survey. Two vocalizing males were heard calling after a light rain

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storm at the vernal pond by the amphitheater at site 1. Two live toads were found in leaf litter and under bark. One DOR toad was found on the road adjacent to site 4a.

Table 2. Summary of the number of animals observed per site.

| Sites | 1 | 2 | 3 | 4a | 4b | Total |
|---------------------------------------|-------|----|-------|----|----|-------|
| Species | | | | | | |
| Amphibians | | | | | | |
| <i>Acris crepitans</i> | | | | | | |
| <i>Anaxyrus americanus</i> | 2 | 2 | | 1 | | 5 |
| <i>Hyla versicolor</i> | 6 | | | | | 6 |
| <i>Hyla chrysoscelis</i> | 6 | | | | | 6 |
| <i>Pseudacris c. crucifer</i> | 10 | | | | | 10 |
| <i>Lithobates catesbeianus</i> | 7 | | | | | 7 |
| <i>Lithobates clamitans</i> | 2 | | 1 | | 2 | 5 |
| <i>Ambystoma maculatum</i> | 5L | | | | | 5 |
| <i>Ambystoma opacum</i> | 1A,3L | | | | | 4 |
| <i>Desmognathus fucus</i> | 3 | | 5 | | | 8 |
| <i>Desmognathus monticola</i> | | 3 | | | | 3 |
| <i>Eurycea cirrigera</i> | 1 | | | | | 1 |
| <i>Hemidactylium scutatum</i> | | 1 | | | | 1 |
| <i>Pseudotriton ruber</i> | | | 1A,1L | 1 | | 3 |
| Reptiles | | | | | | |
| <i>Chelydra serpentina serpentina</i> | | | | | | |
| <i>Terrapene c. carolina</i> | 10 | 2 | 4 | | 2 | 18 |
| <i>Plestiodon fasciatus</i> | 1 | | 1 | | | 2 |
| <i>Sceloporus undulatus</i> | | | 2 | | 1 | 3 |
| <i>Agkistrodon contortrix</i> | 1 | | | | | 1 |
| <i>Carphophis amoenus</i> | 5 | 9 | 2 | 2 | 1 | 19 |
| <i>Coluber constrictor</i> | | | 2 | | | 2 |
| <i>Diadophis punctatus</i> | 1 | 3 | | | | 4 |
| <i>Nerodia sipedon sipedon</i> | 1 | | | | | 1 |
| <i>Regina septemvittata</i> | | | 1 | | | 1 |
| <i>Pantherophis alleghaniensis</i> | 1 | 1 | 1 | | | 3 |
| <i>Virginia valeriae</i> | | | | | 1 | 1 |
| Total Number of animals by site | 66 | 21 | 21 | 4 | 7 | 119 |

3. *Hyla chrysoscelis* (Cope's Gray Treefrog) – [1]

Many males were heard vocalizing on Friday night at both vernal ponds at site 1. One Treefrog was observed being eaten by a Black Ratsnake at the campground vernal pond on Friday night. Two Treefrog egg masses were found floating on the surface of the campground vernal pond on Saturday.

4. *Hyla versicolor* (Common Gray Treefrog) – [1]

The campground and amphitheater vernal ponds yielded many observations of calling Common Gray Treefrogs on Friday night. Two males were heard calling at the amphitheater vernal pond on Friday night.

5. *Lithobates catesbeianus* (American Bullfrog) – [1]

During night searches of the two vernal ponds on site 1, five juvenile and two young adult American Bullfrogs were found.

6. *Lithobates clamitans* (Green Frog) – [1, 3, 4b]

Green Frogs were observed at vernal ponds, by the edge of streams, swimming in a stream, and in road rut puddles.

7. *Pseudacris crucifer crucifer* (Northern Spring Peeper) – [1]

On Friday night a large chorus of Northern Spring Peepers was vocalizing at the amphitheater vernal pond.

8. *Ambystoma opacum* (Marbled Salamander) – [1]

Marbled Salamander larvae were dipnetted at both vernal ponds. One metamorph was found at the edge of the amphitheater vernal pond.

9. *Ambystoma maculatum* (Spotted Salamander) – [1]

Only larvae of *Ambystoma maculatum* were found at both vernal ponds during the survey period.

10. *Desmognathus fuscus* (Northern Dusky Salamander) – [1,3]

Northern Dusky Salamanders were found at sites 1 and 3. Salamanders were found under rocks by streams, at the edge of streams, swim-

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ming in a stream and at the base of a culvert pipe. One gravid female was found to be parasitized by an intradermal trombiculid mite larvae on a hind foot.

11. *Desmognathus monticola* (Seal Salamander) – [2]

Seal Salamanders were only found at site 2. All were discovered under rocks by a stream. One 65 cm SVL adult was found dead in a stream.

12. *Eurycea cirrigera* (Two-lined Salamander) – [1]

Only one Two-lined Salamander was found under a rock by the edge of a stream at site 1.

13. *Hemidactylium scutatum* (Four-toed Salamander) – [2]

A Four-toed Salamander was found under the leaf litter under a log. Club moss was the dominant vegetation at the site of capture.

14. *Pseudotriton ruber* (Red Salamander) – [3, 4a]

One adult Red Salamander was found under a small log at site 3 and one larva was dipnetted in a stream at site 3.

Reptiles

15. *Chelydra serpentina serpentina* (Eastern Snapping Turtle)

No snapping turtles were found inside the boundaries of the state park or state forest. Two DOR turtles were found on 12 and 14 June just outside the park entrance. Two large farm ponds are adjacent to the road where these turtles were observed.

16. *Terrapene carolina carolina* (Eastern Box Turtle) – [1,2,3,4b]

Eastern Box Turtles were the most commonly found turtle species during the survey period. A total of 18 live turtles (11 males, 5 females, and 2 not sexed) and five dried shells were found. Box turtles were found in dry ravine streambeds, on dirt roads, foraging in leaf litter, soaking in stream water, and one was found in a form at the base of a tree.

17. *Plestiodon fasciatus* (Five-lined Skink) – [1,3]

Five-lined Skinks were found in a tree and under debris in a trash pile near the maintenance area.

18. *Sceloporus undulatus* (Fence Lizard) – [3, 4b]

Fence lizards were found basking on logs and rocks on Saturday and Sunday. Two males and one unsexed lizard were observed.

19. *Agkistrodon contortrix mokasen* (Northern Copperhead) – [1]

Under a rock in a rock pile at site 1, a juvenile Northern Copperhead was uncovered. This animal was at least a year old and still had remnants of the sulfur colored tail.

20. *Carphophis amoenus amoenus* (Eastern Wormsnake) – [1,2,3,4a,4b]

Carphophis amoenus was the most commonly found snake species during the survey. Snakes were found at the base of old standing stumps, in logs, under logs, under mats of moss, and under debris piles.

21. *Coluber constrictor constrictor* (Northern Black Racer) – [3]

Two racers were hand captured (112 cm TL and 125 cm TL) at site 3. One was basking by a tree and the other was found at the interface of the tree line with the road.

22. *Diadophis punctatus* (Ring-necked Snake) – [1,2]

Four Ring-necked Snakes were collected in logs, and under logs on Saturday. Each animal had full neck rings and no spots on the ventrum. One DOR adult snakes was found on the road leading to the campground. It had a full neck band and a few spots on the ventrum.

23. *Nerodia sipedon sipedon* (Northern Watersnake) – [1]

One juvenile Northern Watersnake was hand captured at the edge of a stream at site 1. Several other snakes were seen dropping from overhanging branches into the stream and could have been either *Nerodia*

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sipedon or *Regina septemvittata*.

24. *Regina septemvittata* (Queen Snake) – [3]

A juvenile *Regina septemvittata* was hand captured while it was swimming in a stream at site 3.

25. *Pantherophis alleghaniensis* (Eastern Ratsnake) – [1,2,3]

Two Eastern Ratsnakes were found on Friday night. One was collected AOR near the park office, the other was observed eating a *Hyla* sp. (grey treefrog) by the campground vernal pond. A 173 cm ratsnake was treed by survey members at site 3 on Saturday.

26. *Virginia valeriae* (Smooth Earth Snake) – [4b]

One adult Smooth Earth Snake was observed DOR on Tolers Ferry Road near the entrance to state forest property.

Discussion

Of the 14 amphibian and 12 reptile species found on the Scarlet Kingsnake Blitz, virtually all are widely distributed species with a distribution that is either statewide or nearly so. This would include all the species found except *Acris crepitans* where Bedford County is on the western edge of the range, *Hyla chrysoyelis* which is mostly distributed in the Coastal Plain and far southwestern Virginia with only a sparse Piedmont presence, *Hyla versicolor* which is prevalent only in the Piedmont, and *Desmognathus monticola*, prevalent in the Piedmont and western Blue Ridge, Valley and Ridge, and Cumberland Plateau Physiographic Provinces.

Of the 26 species recorded, several are possibly new county records. *Hyla chrysoyelis* and *Ambystoma opacum* are not listed for Bedford County in the Virginia Department of Game and Inland Fisheries' database, and are not recorded for Bedford either in Toby (1985) or Mitchell and Reay (1999), although both are recorded just to the south in Pittsylvania County. *Hyla chrysoyelis* probably has a wider Piedmont distribution than has been previously recognized, and it

would be helpful for researchers to pay closer attention to gray tree-frog calls in the breeding season to better delineate this species' range, especially in the Piedmont. *Ambystoma opacum* is found throughout Virginia and its presence in Bedford County is not surprising. Like most mole salamanders of the genus *Ambystoma*, they can be difficult to find outside of the short breeding season. Their prior absence from the fauna of Bedford County most likely represents a lack of careful surveys during the fall breeding season, and a failure to find the larvae in the early spring.

Both species of gray treefrog were calling at the same time and the same vernal pool at the Park. *Hyla versicolor* is not listed in the VDGIF database, but is found for Bedford County in both Toby (1985) and Mitchell and Reay (1999). *Virginia valeriae* is not listed for Bedford County in the VDGIF database, Toby (1985) or Mitchell and Reay (1999) but is in Linzey and Clifford (1981). Roble et al. (2007) mention that *Virginia valeriae* was found on Co. Rt. 608 during their searches for *Lampropeltis elapsoides* but no vouchers were apparently collected. Thus, it appears that two new county records came from this survey, that for *Hyla chrysoscelis* and *Ambystoma opacum*. Digital recordings of the calls of *Hyla chrysoscelis* and *H. versicolor* were deposited in the VHS digital archive (#126 & 127) as were photographs of a newly metamorphosed *Ambystoma opacum* (#135-136).

There are a large number of species either widespread in Virginia or specifically the Piedmont, which were not found but expected during this survey. These species include: *Lithobates palustris*, *Lithobates sylvatica*, *Eurycea guttolineata*, *Plethodon cinereus*, *Plethodon cylindraceous*, *Chrysemys picta*, *Sternotherus odoratus*, *Plestiodon laticeps*, *Crotalus horridus*, *Pantherophis guttata*, *Heterodon platyrhinos*, *Opheodrys aestivus*, and *Thamnophis sirtalis*. Many of these species are undoubtedly present, but just not encountered during this short survey. For example, Park staff reported that *Crotalus horridus* had been seen in the Park previously as road killed specimens. Bedford County occurs on the eastern or western edge of the

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range of several species, including: *Pseudacris feriarum*, *Gyrinophilus porphyriticus*, *Kinosternon subrubrum*, *Lampropeltis calligaster*, *Lampropeltis getula*, *Lampropeltis triangulum*, *Storeria dekayi*, and *Storeria occipitomaculata* making it likely they also would occur in Smith Mountain Lake State Park. Finally, *Pseudemys concinna* has a sparse distribution in the Piedmont, but appears to be much more prevalent than current range maps would indicate. The River Cooter is likely to occur in the Roanoke River. However, because Smith Mountain Lake was formed by damming rivers in steep valleys, the shoreline recedes quickly, making the placement of turtle traps difficult. Many of the turtles thought likely to occur in the Lake could perhaps be verified if hoop traps could be employed.

The major activities and emphasis for this Park all revolve around water recreation sports. Boating, fishing and swimming are the major activities enjoyed. There is a Nature Program offered, but most events seem poorly attended. The Life of the Park appears to revolve around the Lake and the water activities it presents. For the number of trails available, there seemed to be few people enjoying them and the wildlife associated with the outdoors. We hope this work may encourage others to explore the natural beauty of the Park and the wildlife it harbors.

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Acknowledgments:

Craig Abbott, Scott and Sophie Duncan, Jason and Mark Gibson, Kyle Harris, Brian and Mitchell Kim, David and Jennifer Kiser, Michael and Nancy Percy, Paul and Nancy Sattler, Gene and Katherine Sattler, Kory and Emily Steele, David and Wes Van Gelder, John, Amy and Cherise White, Gordon Wilson, and Dennis Woodson all helped collect data for this survey. Special thanks to Lauri Schular for help in organizing survey locations.