Herpetological Survey of Big Woods State Forest & Wildlife Management Area

23 April & 7 May, 2017
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Introduction

Big Woods State Forest (BWSF) and Wildlife Management Area (BWWMA) are located in Sussex County. BWSF was acquired from the Nature Conservancy in 2010 and is comprised of 885.2 hectares (2188 acres) of pine forest and wetlands. BWWMA is comprised of two separate tracts. One tract, acquired from the Nature Conservancy in 2010, is adjacent to BWSF and consists of 886.3 hectares (2190 acres) of Pine Forest and wetlands. These properties are jointly and cooperatively managed by the Virginia Department of Forestry (VDOF) and the Virginia Department of Game and Inland Fisheries (VDGIF). These properties are located east of Beaver Pond Road (Rt. 606). The second BWWMA property is named Parker's Branch Tract (BWPBT) and is located near the other properties but is west of Beaver Dam Road. BWPBT was acquired by VDGIF from the nature conservancy in 2016 and consists of 795.2 hectares (1965 acres) of upland Loblolly pine forest and mature forest swamp. All these properties were logged and managed by the timber industry prior to Nature Conservancy ownership.

Each of these properties is being managed to develop additional habitat for the federally endangered Red-cockaded Woodpecker (RCW), which has been documented and is being monitored at the northern most edge of its range in the adjacent property of Piney Grove Nature Preserve of the Nature Conservancy. Another objective is to help restore the Long Leaf Pine forest to the area. These management strategies require a continued thinning of the forest and reduction of the forest understory through prescribed burns. RCWs require live mature pine trees to produce nesting cavities and mature open forests are ideal habitat. The impact of prescribed burns on amphibian and reptile populations is unclear.

All of the Big Woods properties are of interest to the VHS Conservation Committee because 16 herpetological species having a Virginia Department of Game and Inland Fisheries (VDGIF) conservation status of Tier I-IV have been documented for Sussex County.

Due to the large area to be surveyed, two Sunday survey dates, 23 April and 7 May 2017 were selected. Sunday was the day chosen to avoid any safety concerns with spring turkey hunting season (Monday-Saturday). Ten participants surveyed BWSF/BWMA/BWPBT ("BW") on 23 April and fourteen participants surveyed on 7 May.

Survey Sites

The following is a general description of the survey sites. Coordinates were specific GPS coordinates provided by the group leaders at the survey starting point. GPS coordinates for the beaver pond within BWSF was also recorded.

Site-1-Grassy Marsh (36.95951 º N, -77.05955 º W) Site-1 is located south of the portion of New Cut Road within BWWMA that forms the border with the Piney Grove Nature Preserve. This area is a grassy marsh with water depths less than 0.5 meters backing up to pine woods. This site was surveyed on 23 April and late in the afternoon of 7 May. A prescribed burn occurred in the marsh area between the survey dates.

Site-2-Ellis Path Creek (36.94250 º N, -77.05740 º W) Site-2 includes the creek and wetlands on both sides of Ellis Path within BWWMA and the pine woods area to the east and west of Ellis Path. The west pine woods area was burned about 5 weeks prior to 23 April. There was substantial charring of the forest floor and logs, but the understory vegetation was recovering. The east pine woods area to Faison Path had been previously burned but the understory vegetation was more fully developed. This site was surveyed on 23 April and minnow traps were placed in the creek on 22 April and 6 May and were retrieved and inspected on 23 April and 7 May.

Site-3- Knob Path North (36.93870 º N, -77.07475 º W) Site-3 includes the pine woods north of Knob Path and its ancillary trails as well as the north side of the beaver pond (36.93611ºN, -77.08586) which bisects Knob Path within BWSF. The eastern portion of Knob Path and its ancillary trail to the north were surveyed on 23 April. This area consisted of pine woods and had previously been burned but the understory vegetation was recovering. The western portion of Knob Trail and the northern side of the beaver pond were surveyed on 7 May. The area to the north of Knob Trail had been burned shortly before the 7 May survey. The pine woods forest floor and log debris were completely charred and understory vegetation was non-existent.

Site-4-Faison Path East (36.95155 º N, -77.03830 º W) Site-4 included the area north and south of Faison Path east of New Cut Road within BWWMA. This site consisted of pine woods, laden with log debris, and marsh and wet areas. The area had been burned at some time in the past but the understory was recovering. This site was surveyed on 7 May.

Site-5-Horse Path (37.93000 º N, -77.05251 º W) Site-5 was the area north and south of the Horse Path to the east of Line Pine Road within BWWMA. The area consisted of pine woods and some hardwoods and was thick with understory vegetation. This site was surveyed on 7 May.

Site-6- Parker's Branch South (36.93774º N, -77 º.12479W) Site-6 includes the area south of the last parking lot within BWPBT between Assamoosick Swamp to the west and Parker's Branch to the east. This site includes trails, pine woods and swamps. Some hardwoods, including maple, poplar, dogwood and sumac were also present. This site was surveyed on 7 May.

Site-7-Parker's Branch West (36.95310 º N, -77.13368 º W) Site -7 includes the trail to the north of Summerfield Road (Rt. 604) that borders the edge of Assamoosick Swamp. In addition to forest swamp, the area includes pine woods, some hardwoods and an open area with woody debris. This site was briefly visited on 23 April and surveyed on 7 May.

Figure 1. Map showing the survey area within BWWMA and BWSF. Survey sites are indicated by numbers.

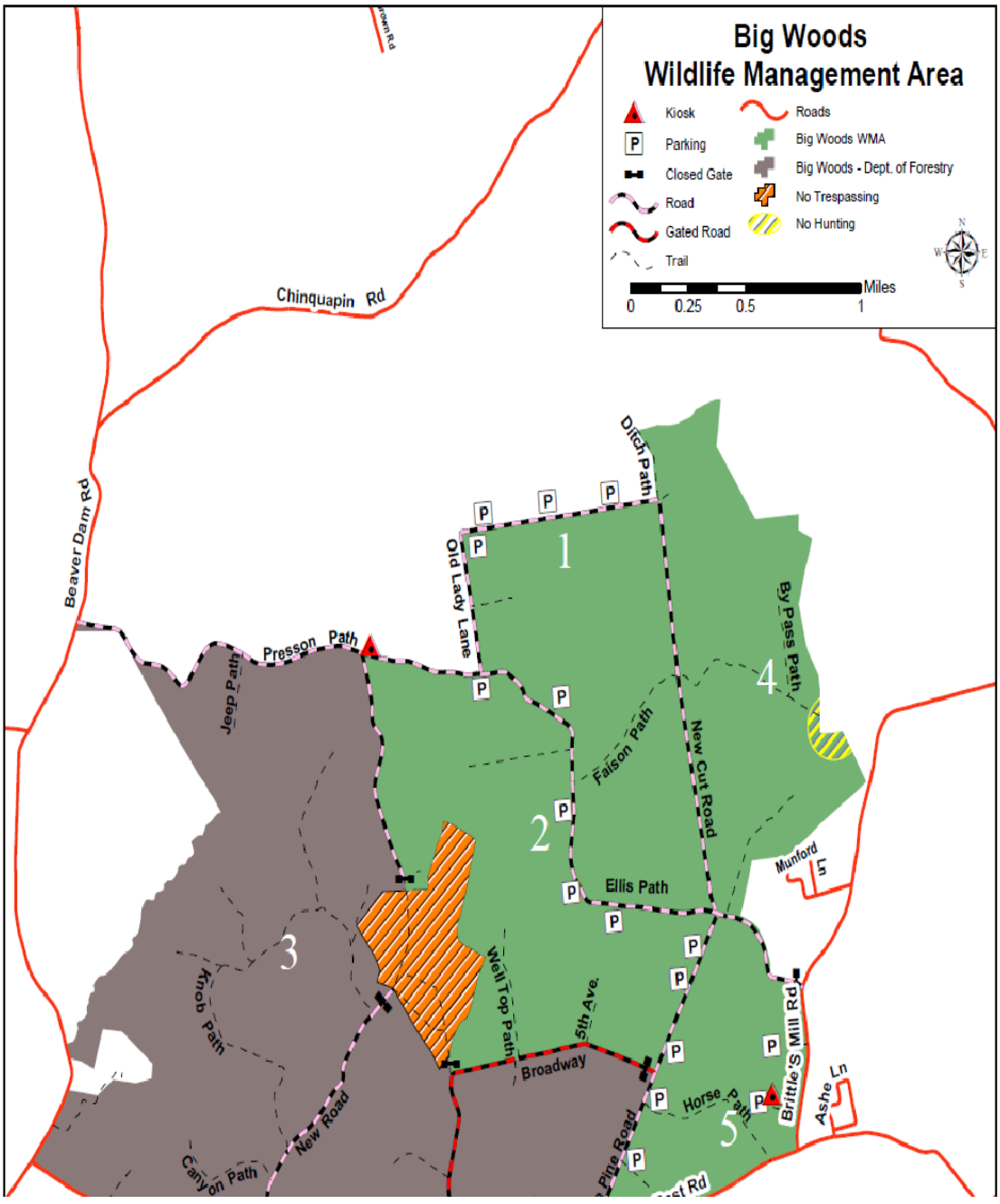
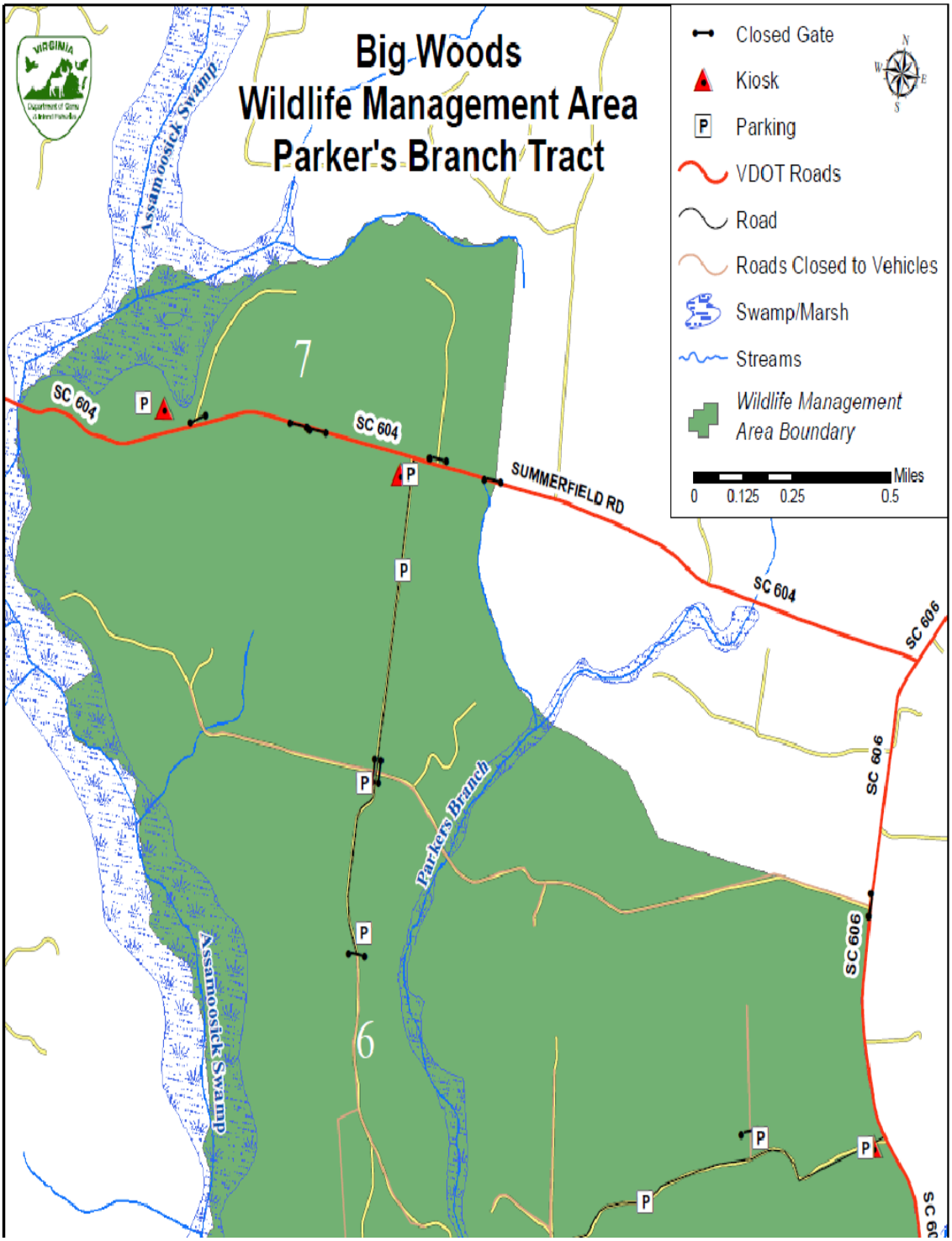


Figure 2. Map showing survey sites within BWPBT. Survey sites are marked by numbers.



Materials and Methods

Several traps were used to try to capture tadpoles, frogs and turtles. One hoop turtle trap, baited with sardines, was positioned during the afternoon of 22 April in the swamp area within Site-7. Eight minnow traps were also positioned on the afternoon of 22 April. Four minnow traps were placed in the creek on both sides of Ellis Path within Site-2. Two minnow traps were placed in the creek on the east side of New Road within Site-3 and two minnow traps were placed in Assamoosick Swamp within Site-7.

Ten volunteers participated in the survey for approximately four hours (from 09:00 to 13:00h) in the field on 23 April for a net survey total of about 35 person hours (subtracting travel time between sites). Due to the limited number of participants, one survey group was organized to survey four sites within CWMA (Sites-1 through 3 and 7 as described above). Weather conditions were unfavorable for most of the survey, with overcast skies and drizzle throughout the day. Temperatures remained unseasonably cool and constant at about 12 -13^{o} C.
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 many 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.
On the afternoon of Saturday 6 May, a hoop turtle trap baited with sardines was placed in the beaver pond on the north side of Knob Path within Site-3. Ten minnow traps were also positioned during the afternoon of 6 May. Two were placed in the grassy marsh within Site-1, four were placed in the creek on both sides of Ellis Path within Site-2 and four were placed in the beaver pond on both sides of Knob Path within Site-3.

Fourteen volunteers participated in the survey on 7 May from 09:00 to 15:30 for a net survey total of about 84 person hours (subtracting travel time between sites). Due to the large area to be surveyed, the volunteer participants were split into groups. One group surveyed Sites-1, 3, 4 and 5 and the other survey group surveyed Sites-6 and 7. Skies were mostly clear and sunny, although the air temperature remained unseasonably cool and ranged from 11-18 ^{o}C. There was some light rain in the afternoon. The following tables summarize the survey effort.

Table 1. Summary of the survey effort on 23 April 2017.

Survey Site	No. of Surveyors	Hours	Estimated Person Hours
1-Grassy Marsh	10	1	**10**
2-Ellis Path Creek	10	1	**10**
3-Knob Path North	10	1	**10**
7- Parker's Branch West	10	0.5	**5**
Total			**35**

Table 2. Summary of the survey effort on 7 May 2017.

Survey Site	No. of Surveyors	Hours	Estimated Person Hours
1-Grassy Marsh	6	0.5	**3**
3-Knob Path North	6	2.5	**15**
4-Faison Path East	6	1.5	**9**
5-Horse Path	6	1.5	**9**
6-Parker's Branch South	8	5.0	**40**
7-Parker's Branch West	8	1.0	**8**
Total			**84**

Results

During the two days of survey a total of 33 species were captured or positively identified, including 18 Amphibians and 15 Reptiles (Table 3). The survey produced a total of nine anuran, nine salamander, five snake, eight turtle and two lizard species. More than 107 animals were captured or positively identified. However, only five of the previously documented 16 Sussex County species with VDGIF conservation status tier I-lV were found (Tier III *Lithobates virgatipes, Terrapene c. carolina* and Tier IV *Heterodon platirhinos, Pseudotriton m.montanus,Trachemys s. scripta*). Three new Sussex County records were documented (*Hemidactylium scutatum, Plethodon cylindraceus, Pseudotriton m. montanus)*. One recently discovered Virginia species, *Lithobates Kauffeldi* was also documented. Table 3 summarizes the results for both survey dates.

Table 3. Survey Results

Site	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
Class Amphibia								
Anuran Species								
Acris gryllus	CM	1	2	3		1	1	**>9**
Anaxyrus fowleri		1						**1**
Gastrophryne carolinensis						1		**1**
Lithobates clamitans		3	1		1			**5**
Lithobates kauffeldi						1		**1**
Lithobates sphenocephalus	3			10		1	1	**15**
Lithobates virgatipes			1					**1**
Pseudacris crucifer	1							**1**
Pseudacris feriarum	CM							**>1**
Total Anurans	**>6**	**5**	**4**	**13**	**1**	**4**	**2**	**>35**

Site	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Totals**
Salamander species								
Ambystoma maculatum						7		**7**
Ambystoma opacum						21		**21**
Desmognathus auriculatus						1		**1**
Eurycea cirrigera		1						**1**
Hemidactylium scutatum							1	**1**
Notophthalmus v. viridescens						1		**1**
Plethodon chlorobryonis					2		3	**5**
Plethodon cylindraceus		1						**1**
Pseudotriton m. montanus							1	**1**
Total Salamanders		**2**			**2**	**30**	**5**	**39**
Total Amphibians	**>6**	**7**	**4**	**13**	**3**	**34**	**7**	**>74**
Class Reptilia								
Snake Species								
Carphophis a. amoenus	1		1			1		**3**
Coluber c. constrictor						5		**5**
Heterodon platirhinos			1					**1**
Nerodia s. sipedon			2					**2**
Storeria o. occipitomaculata			1					**1**
Total Snakes	**1**		**5**			**6**		**12**
Turtle species								
Chelydra serpentina			1					**1**
Kinosternon s. subrubrum						2		**2**
Pseudemys c. concinna						1		**1**
Pseudemys c. floridana						1		**1**
Pseudemys rubriventris			1					**1**
Sternotherus odoratus			1					**1**
Terrapene c. carolina		1	4	4		1		**10**
Trachemys s. scripta			1					**1**
Total Turtles		**1**	**8**	**4**		**5**		**18**
Lizard Species								
Sceloporus undulatus							2	**2**
Scincella lateralis			1			1		**2**
Total Lizards			**1**			**1**	**2**	**4**
Total Reptiles	**1**	**1**	**14**	**4**		**12**	**2**	**34**

Key: Site 1. Grassy Marsh, Site 2. Ellis Path Creek, Site 3. Knob Path North, Site 4. Faison Path East, Site 5. Horse Path, Site 6. Parker's Branch South, Site 7. Parker's Branch West

Annotated Checklist

Amphibians

1. *Acris gryllus* (Southern Cricket Frog) More than nine Southern Cricket Frogs were observed throughout the survey and were found at all of the survey sites except Site-5. Several males could be heard calling from the marsh area within Site-1 on 23 April but they were not heard during a brief return visit during the afternoon of 7 May. One adult was observed on the forest floor in the burned area within Site-2. Two adult Southern Cricket Frogs were observed in a puddle near the creek within Site-3. Three adult Southern Cricket Frogs were observed hopping in a wet area in the woods within Site-4. One adult Southern Cricket Frog was captured along the trail within Site-6 and photographed. One adult Southern Cricket Frog was captured in a tire rut puddle on the trail within Site-7 and was photographed. All of the observed Southern Cricket Frogs appeared to be healthy.

2. *Anaxyrus fowleri* (Fowler's Toad) One adult Fowler's Toad was observed under a charred log near the creek within Site-2 and was captured and appeared to be healthy.

3. *Gastrophryne carolinesis* (Eastern Narrow-mouthed Toad) One adult Eastern Narrow-mouthed Toad was captured alongside Route 604 while traveling from Site-6 to Site-7. The individual appeared to be healthy.

4. *Lithobates clamitans* (Green Frog) Four adult Green Frogs and one juvenile were observed during the survey. Three adult Green Frogs were observed in the creek within Site-2. One adult male could be heard calling from the beaver pond within Site-3. The juvenile Green Frog was observed in a water slough within Site-5 and was captured by dip net. There did not appear to be any obvious health issues for any of the Green Frogs

5. *Lithobates kauffeldi* (Atlantic Coast Leopard Frog) One adult Atlantic Coast Leopard Frog was found in a tire rut on the trail within Site-6 and was captured. Photographs were taken and this individual appeared to be healthy. This is a newly discovered Virginia Species.

6. *Lithobates sphenocephalus* (Southern Leopard Frog) Fifteen Southern Leopard Frogs were observed during the survey. Three Southern Leopard Frog Tadpoles were captured by dip net from the marshy area within Site-1. Ten Southern Leopard Frog Tadpoles were captured by dip net from a wet area within Site-4. One adult Southern Leopard Frog was observed alongside the swamp within Site-6 was captured and photographed. One young adult Southern Leopard Frog was observed in a tire rut puddle on the trail within Site-7 was captured and photographed. All of the captured animals appeared to be healthy.

7. *Lithobates virgatipes* (Carpenter Frog) A single adult male Carpenter Frog could be heard calling from the beaver pond within Site-3 during the afternoon of 6 May when the turtle and minnow traps were being positioned. A single male was heard calling during the afternoon of 7 May and was later captured by dip net and photographed. It is not known if these were the same specimens and only one individual is recorded in this report.

8. *Pseudacris crucifer* (Spring Peeper) One Spring Peeper tadpole was captured with a dip net from the marsh within Site-1 and appeared to be healthy.

9. *Pseudacris feriarum* (Upland Chorus Frog) Several male Upland Chorus Frogs could be heard calling from the marsh within Site-1 on 23 April. They we not heard during a brief return visit on the afternoon of 7 May.

10. *Ambystoma maculatum* (Spotted Salamander) Seven Spotted Salamander larvae were captured and photographed within Site-6. Two Spotted Salamander larvae were found in a tire rut puddle in the trail and 5 more were observed in a large puddle in the southernmost trail within Site-6. All Spotted Salamander larvae appeared to be healthy.

11. *Ambystoma opacum* (Marbled Salamander) Twenty one Marbled Salamanders were observed within Site-6. One adult Marbled Salamander was found under a log in a predominantly pine forest area and was photographed. Ten Marbled Salamander larvae were found in a tire rut puddle in the trail and were photographed. Ten more were observed in a large puddle in the southernmost trail within Site-6 and were captured. All of the Marbled Salamanders appeared to be healthy.

12. *Desmognathus auriculatus* (Southern Dusky Salamander) One adult Southern Dusky Salamander was observed alongside downed logs near the swamp edge within Site-6. The Southern Dusky Salamander was captured, photographed and appeared to be healthy.

13. *Eurycea cirrigera* (Southern Two-lined Salamander) One adult Southern Two-lined Salamander was found under a log near the creek within Site-2 in the prescribed burn area. The Southern Two-lined Salamander was captured, photographed and appeared to be healthy.

14. *Hemidactylium scutatum* (Four-toed Salamander) One adult Four-toed Salamander was found under a log near the edge of pine forest and an open area within Site-7. The Four-toed Salamander was captured and photographed to document a new Sussex County record. The Four-toed Salamander appeared to be healthy.

15. *Notophthalmus v. viridescens* (Red-spotted Newt) One adult Red-spotted Newt was found under a log at the edge of pine woods and an open area within Site-6. The Red-spotted Newt was captured, photographed and appeared to be healthy.

16. *Plethodon chlorobryonis* (Atlantic Coast Slimy Salamander) Five adult Atlantic Coast Slimy Salamanders were observed during the survey. Two adult Atlantic Coast Slimy Salamanders were found under a large pine tree branch of a downed tree 3 meters from Horse Path trail within Site-5 Three adult Atlantic Coast Slimy Salamanders were observed within Site-7. All were observed under logs; one near the trail, one near the swamp edge and one in an open area. All five adult Atlantic Coast Slimy Salamanders were captured, photographed and appeared to be healthy.

17. *Plethodon cylindraceus* (White-spotted Slimy Salamander) One sub-adult White-spotted Slimy Salamander was found under a log in the prescribed burn area within Site 2. The White-spotted Slimy Salamander was captured and photographed to document a new Sussex County record. The White-spotted Slimy Salamander appeared to be healthy.

18. *Pseudotriton m. montanus* (Eastern Mud Salamander) One adult Eastern Mud Salamander was found under a log at the edge of pine woods and an open area within Site-7. The Eastern Mud Salamander was captured and photographed to document a new Sussex County record. The Eastern Mud Salamander appeared to be healthy.

Reptiles

19. *Carphophis a. amoenus* (Eastern Wormsnake) Three adult Eastern Wormsnakes were observed during the survey. One adult was under a log within Site-1 near Old Lady Lane in an area that had not been burned. Another adult was observed under a log along one of the ancillary paths north of Knob Path in an area where vegetation was recovering from a previous prescribed burn. One adult Eastern Wormsnake was found under a log within Site-6. All of the Eastern Wormsnakes were captured, photographed and appeared to be healthy.

20. *Coluber c. constrictor* (Northern Black Racer) Five adult Northern Black Racers were observed during the survey. All of these observations were within Site-6, two were captured and one was photographed. One adult was observed crossing the road. Two Northern Black Racers were basking, one in an open spot in the woods and the other in an open field near the woods and the parking lot. Two adults were observed fleeing, one into a thicket the other from a basking spot up into a small tree. All of the Northern Black Racers appeared to be healthy.

21. *Heterodon platirhinos* (Eastern Hog-nosed Snake) One adult black phase Eastern Hog-nosed Snake was discovered basking in Knob Path within Site-3, about 2 meters from the recent prescribed burn area north of Knob Path. The snake was heading in a direction away from the burn area. The Eastern Hog-nosed Snake was captured and photographed. After handling a small toad was regurgitated and the death act followed. This Individual appeared healthy with an overall length of approximately 51 cm.

22. *Nerodia s. sipedon* (Northern Watersnake) Two adult Northern Watersnakes were captured in a single minnow trap within the beaver pond south of Knob Path within Site-3. One specimen was much larger than other. Both individuals were photographed and appeared to be healthy.

23. *Storeria o. occipitomaculata* (Northern Red-bellied Snake) One sub-adult Northern Red-bellied snake was found under a charred log about 2 meters into the recent prescribed burn area north of Knob Path within Site-3. The Northern Red-bellied Snake was captured, photographed and appeared to be healthy.

24. *Chelydra serpentina* (Snapping Turtle) An adult Snapping Turtle was observed basking on a log in the beaver pond to the north of Knob Path within Site-3.

25. *Kinosternon s. subrubrum* (Southeastern Mud Turtle) Two adult Southeastern Mud Turtles were observed on the forest floor within Site-6. Both turtles were captured, photographed and appeared to be healthy.

26. *Pseudemys c. concinna* (Eastern River Cooter) The shell of a deceased Eastern River Cooter was found next to a log in the woods by the swamp within Site-6.

27. *Pseudemys concinna floridana* (Coastal Plain Cooter) One large adult Coastal Plain Cooter was discovered crossing Route 604 while traveling from Site-6 to Site-7. The turtle was captured and photographed and appeared to be healthy.

28. *Pseudemys rubriventris* (Northern Red-bellied Cooter). The shell of a deceased adult Red-bellied Cooter was found about ten meters north of Knob Path and about five meters from the beaver pond on the afternoon of 6 May within the recent prescribed burn area. The carapace was substantially cracked and bleached but the plastron retained its color and was fully intact. Although the shell was in the recent prescribed burn area, it was not charred. The remains appeared to have been there for a while.

29. *Sternotherus odoratus* (Eastern Musk Turtle) The bleached shell of an Eastern Musk Turtle was found on the forest floor near the beaver pond on the south side of Knob Path within Site-3.

30. *Terrapene c. carolina* (Woodland Box Turtle) Ten adult Woodland Box Turtles were observed during the survey. Five of these specimens were alive and five were deceased. One adult Male Woodland Box Turtle was observed partially buried on the forest floor next to a tree within Site-2. This large male (carapace length of 13 cm) had some minor damage on one carapace scute. Three healthy adult Woodland Box Turtles were discovered within Site-3 Two adult males were observed on south side of Knob Path near the beaver pond and an adult female was found on the north side of Knob Path near the beaver pond but within the recent prescribed burn area. One healthy adult male Woodland Box Turtle was found basking on the trail within Site-6. This individual was captured, photographed and appeared to be healthy. The faded shells of four adult Box Turtles were discovered within Site-4. The condition of the shells indicated that they had been deceased for a while. Three of the remains were found on the forest floor, one of which was beneath a tree. The last of the remains was found on top of a tree stump. One recently deceased male Woodland Box Turtle was discovered on the afternoon of 6 May north of Knob Path about three meters into the recent prescribed burn area within Site-3. This turtle did not appear to be significantly charred and the spot beneath it was unburned. It appears to have been a victim of the prescribed burn and is depicted below.

31. *Trachemys s. scripta* (Yellow-bellied Slider). An adult female Yellow-bellied Slider was found heading into the recent prescribed burn area about 1 meter from Knob Path. The adult female appeared to be starting to dig a hole. The turtle was captured, photographed, measured (carapace length of 25 cm) and appeared to be healthy.

32. *Sceloporus undulatus* (Eastern Fence Lizard).Two adult Eastern Fence Lizards were observed basking within Ste-7. One was on the ground near the road and the other was basking on a pine tree near the trail.

33. Scincella lateralis (Little Brown Skink) Two adult Little Brown Skinks were observed during the survey. One adult was found under a charred log about 2 meters into the recent prescribed burn area north of Knob Path within Site-3. One adult Little Brown Skink was observed in leaf litter within Site-6.

Discussion

During the two day survey of "BW", the VHS survey groups positively identified more than 107 specimens representing thirty three species (Table 3). There were eighteen species of amphibians (nine frogs and nine salamanders) and fifteen species of reptiles (five snakes, eight turtles and two lizards). Thirty of the thirty three species encountered had been previously documented for Sussex County. Three new county records, *Hemidactylium scutatum* , (Four-toed Salamander), *Plethodon cylindraceus* (White-spotted Slimy Salamander) and *Pseudotriton m. montanus* (Eastern Mud Salamander) were documented. *H. scutatum* had previously been documented in Dinwiddie County adjacent to and west of Sussex County. However, *P. cylindraceus* had not been previously documented from any county adjacent to Sussex. Chesterfield is the closest county with a record for this species. *P. m. montanus* had previously been documented in Surry County adjacent to and northeast of Sussex County. A recently discovered Virginia species, *Lithobates kauffeldi* was also documented in "BW" during the survey.

There were five species, captured and photographed, with a designated conservation status as defined in "Virginia's 2015 Wildlife Action Plan" published by VDGIF ; *Heterodon platirhinos* (Eastern Hog-nosed Snake), *Lithobates virgatipes* (Carpenter Frog) , *Pseudotriton m. montanus* (Eastern Mud Salamander), *Terapene c. carolina* (Woodland Box Turtle) and *Trachemys s. scripta* (Yellow-bellied Slider). *H. platirhinos, P. m. montanus* and *T. s. scripta* have a conservation status of "*Tier lV. Moderate Conservation Need." L. virgatipes* and *T. c. carolina* have a conservation status of *"Tier lll. High Conservation Need."* In addition, VDGIF gives each tiered species a conservation opportunity ranking of **A, B or C.** An **A** ranking indicates "on the ground" species or habitat management strategies have been identified that are expected to benefit this species, at least some of which can be implemented with existing resources and have a reasonable chance of improving the species conservation status. A **B** ranking indicates only research needs have been identified for this species or "on the ground" conservation actions cannot be implemented due to resource constraints. A **C** ranking indicates no "on the ground" conservation actions or research needs that could benefit this species have been identified or all identified conservation opportunities for a species have been exhausted. *L. virgatipes, P. m. montanus* and *T. c. carolina* have an **A** ranking. For each of these species habitat conservation and restoration are underway (wetlands preservation and water quality improvement for the

aquatic species and open canopy forest and meadows preservation for *T. c. carolina)*. *T. s. scripta* has a **B** ranking. Inter-breeding with the non-native subspecies *Trachemys scripta elegans* (Red-eared Slider) threatens the genetic integrity of *T. s. scripta*. Before conservation actions can be identified, more research is required to more fully determine the extent to which *T. s. scripta* and *T.s.elegans* have interbred and to determine if it is feasible to remove and prevent the future introduction of *T. s .elegans*. *H. platirhinos* has a **C** ranking. No threat, research or conservation actions have been identified for this species. Despite its Tier III status, *T. c. carolina* was the most frequently observed reptile during the survey. Five living individuals were captured and five deceased specimens were observed during the survey and were found at four of the seven survey sites. The carapace remains of five adults were found at Site-3 (one) and Site-4 (four). All carapace remains from Site-4 were substantially faded, indicative that mortality was not recent. The recently deceased adult within Site-3 was approximately three meters into the recent prescribed burn area and an apparent victim.

Twelve other species with VDGIF conservation status Tier IV-II, which had previously been documented for Sussex County, were not observed during the survey. These are *Ambystoma mabeei* (Mabee's Salamander), *Anaxyrus quercicus* (Oak Toad), *Cemophora coccinea copei* (Northern Scarletsnake), *Clemmys guttata* (Spotted Turtle), *Farnacia a. abacura* (Eastern Mudsnake), *Farancia e. erytrogramma* (Common Rainbow Snake), *Hyla gratiosa* (Barking Treefrog), *Necturus punctatus* (Dwarf Waterdog), *Pseudacris nigrita* (Southern Chorus Frog), *Pseudacris ocularis* (Little Grass Frog), *Scaphiopus holbrookii* (Eastern Spadefoot) and *Thamnophis s. sauritus* (Common Ribbonsnake).

The portion of Site-2 west of Ellis Path and north of the creek underwent a prescribed burn approximately five weeks prior to the VHS survey of this site on 23 April. Five amphibians (*Acris gryllus, Anaxyrus fowleri, Eurycea cirrigera, Lithobates clamitans* and *Plethodon cylindraceus)* and one reptile species (*terrapene c. carolina)* were documented in this area. All the animals were found either on the forest floor or under logs except for 3 specimens of *L. clamitans,* which were all in the creek. All of the animals appeared to be alive and healthy.

The literature contains contradictory reports on the impact of prescribed burns on amphibian and reptile populations in Virginia. Keyser et al (2004) reported no difference in the relative abundance of all amphibians and reptiles captured in 1996 in unburned and seasonally burned (winter, spring, summer of 1995) oak wood and other hardwood stands within Horsepen Wildlife Management Area in the Virginia Piedmont (Buckingham County). In their study, 133 individuals of ten species were captured over 12,270 pitfall trap nights. Two species of amphibians, *Anaxyrus a. americanus* (Eastern American Toad) and *Plethodon cinereus* (Eastern Red-backed Salamander) were captured in equal abundance in burned and unburned stands. Three species of reptiles, *Sceloporus undulatus, Scincella lateralis* and *Plestiodon inexpectatus* (Southeastern Five-lined Skink) combined were captured more frequently in burned vs. unburned stands.

Mitchell (2000) reported that six species of amphibians and reptiles were found in unburned sections and eight species were found in the still smoldering burnt area of Fort A. P. Hill within the Upper Coastal Plain of Virginia (Caroline County). However, more individual amphibian

specimens were found in the unburned stands (46) compared to the burned stands (15). Adults of two species *Anaxyrus a. americanus* and *Plethodon cinereus* were found dead under logs. Mitchell's survey was conducted immediately after the prescribed burn in comparison with the multi-month time lapse in the Keyser study.

The area within Site-3 to the north of Knob Path west to the beaver pond was burned a few days prior to the 7 May survey. This area was only surveyed in the near proximity (up to 10 meters) to Knob Path. No amphibian species were encountered. A single specimen of five reptile species, *Heterodon platirhinos, Pseudemys rubriventris, Scincella lateralis, Storeria o. occipitomaculata* and *Trachemys s. scripta* was documented. Two specimens of *Terrapene c. carolina* were found. *S. lateralis* and *S. o. occipitomaculata* were found under charred logs about two meters off Knob path. Each appeared to be healthy. *H. platirhinos* was basking on Knob Path about 2 meters from the prescribed burn area heading away from it. The snake regurgitated a small toad as it was being handled. *T. s. scripta* was observed about 1 meter into the burn area and appeared to be starting to dig a nest hole. The deceased remains of *Pseudemys rubriventris* were about 10 meters north of Knob Path near the beaver pond. The carapace was cracked and bleached and death pre-dated the prescribed burn. A healthy adult female *T. c. carolina* was found on the charred forest floor near the beaver pond and a recently deceased adult male *T. c. carolina* was about 3 meters from Knob Path, an apparent victim of the prescribed burn. The ground all around the turtle was charred but there was only minor charring of the turtle remains. The spot beneath the turtle was not charred or burned.

Hingtgen (2000) summarized the observations of park personnel from 14 state parks of southwestern Florida providing anecdotal information on the interaction of wildlife and fire during the period of 1977 t0 1996. Fire associated activities of 7 species of amphibians and 28 species of reptiles were included. Most amphibians observed were fleeing the fire, jumping ahead of the flames or concentrating in wetlands and puddles within the burn zone. None were observed consumed by flames nor were any carcasses observed. Several instances of predation on amphibians were observed during and immediately after burns.

Among the reptiles, several species seemed to suffer inordinately high mortality from fire, or their carcasses were simply more likely to be noticed. Many observations noted that fire killed *Terrapene c. carolina* (70% of box turtle observations). Snakes were most often reported fleeing from fires, sometimes in large numbers. Other observations suggested that some snakes may have been hunting prey flushed by fires. *Thamnophis s. sirtalis* (Eastern Gartersnake) captured and consumed *Anaxyrus terrestris* (Southern Toad) within minutes after a burn and *Coluber constrictor priapus* (Southern Black Racer) did the same with *Hyla cinerea* (Green Treefrog). The *Heterodon platirhinos* observed basking in Knob Path within Site-3 on 7 May could have been similarly opportunistic.

When Site-1 was surveyed on 23 April, there was no evidence of a prescribed burn. Several *Acris* gryllus and *Pseudacris feriarum* calling males could be heard in the marsh area. Site-1 was briefly visited at about 15:00h on both 6 & 7 May to place and retrieve minnow traps. The marsh area had been burned between the survey dates and there were no frog calls heard on either day. The continued use of prescribed burns at BW to expand habitat opportunity for RCW and Long Leaf Pines will also provide a potential opportunity to further research interaction with fire by native Virginia species of amphibians and reptiles.

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