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RESEARCH ARTICLE

UNUSUALLY HIGH HERPETOFAUNAL SPECIES RICHNESS AT ARCH OF THE NOTTOWAY WILDLIFE MANAGEMENT AREA IN SUSSEX COUNTY, VIRGINIA

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ABSTRACT

Arch of the Nottoway Wildlife Management Area (WMA) is a 638-hectare property in Sussex County, Virginia managed by The Virginia Department of Wildlife Resources (DWR). Between June 2021 and March 2024, I documented the herpetofaunal biodiversity at the WMA using a variety of survey methods, including visual encounter surveys, bioacoustic surveys, road surveys, cover boards, and aquatic traps. I documented 51 species, including 27 amphibians and 24 reptiles, representing one-third of Virginia's herpetological diversity. Of these, six species are listed by the DWR as Species of Greatest Conservation Need in Virginia's 2025 State Wildlife Action Plan (DWR, 2025b) and three are listed by the Virginia Department of Conservation and Recreation Division of Natural Heritage as state rare or watchlist species (Roble, 2025). I identified three species as new county records: *Stereochilus marginatus* (Hallowell, 1856), *Virginia valeriae valeriae* (Baird & Girard, 1853), *Nerodia taxispilota* (Holbrook, 1838), and confirm the county record of *Pseudemys concinna concinna* (Le Conte, 1830). I document the first record of *N. taxispilota* in the Nottoway River drainage in Virginia, and one of the only records of *P. c. concinna* east of the Fall Line in southeastern Virginia. The addition of these four species brings the total number of species documented in the county to 80. With these additions, Sussex is now the most species-rich county in Virginia, reflected in the incredible biodiversity at Arch of the Nottoway Wildlife Management Area.

Keywords: amphibian, biodiversity, inventory, reptile, conservation.

INTRODUCTION

In 2021, The Conservation Fund (TCF) purchased a 638-hectare property along the Nottoway River in Sussex County, Virginia. In 2024, TCF transferred ownership to The Virginia Department of Wildlife Resources (DWR), who opened the site to the public as Arch of the Nottoway Wildlife Management Area (WMA). Prior to its purchase by TCF, the property was

primarily managed as timberlands. The site is within an area designated as a Wildlife Biodiversity Resilience Corridor by Virginia's Wildlife Corridor Action Plan (DWR et al., 2023).

Sussex County is a hotspot of rare species richness (DCR-DNH, 2022). Despite this, published herpetofaunal surveys of Sussex County have been scarce and largely limited in taxonomic scope. Turtle surveys in the Blackwater River drainage from 1987–1988 found three species (Norman, 1989; Norman & Mitchell, 2014). Opportunistic anuran (i.e., frogs and toads) surveys along roads in summer 2003 found 13 species (Roble et al., 2005). Perry (2018) and Sattler & Gibson (2024) represent the only published full-taxa herpetofaunal surveys in Sussex County. These surveys found 56 species between 2017 and 2024 at the Big Woods State Forest, Big Woods Wildlife Management Area, and Flippo-Gentry Wildlife Management Area (approximately 18 km ESE of the Arch of the Nottoway WMA). Other than these surveys, the herpetofauna of Sussex County has primarily been documented state books and atlases (Tobey, 1985; Mitchell, 1994; Mitchell & Reay, 1999) and in numerous geographic distribution notes (e.g., Songer, 2020). In total, 77 amphibian and reptile species have been documented in Sussex County (VHS, 2025).

Here, I present the first herpetofaunal inventory of the Arch of the Nottoway WMA, and one of the most comprehensive surveys in Sussex County to date. With this survey, I aim to update the herpetology of Sussex County, create a baseline for future research and monitoring, and inform conservation management actions at the WMA.

MATERIALS AND METHODS

Study site

Arch of the Nottoway Wildlife Management Area is located on the unpaved Cabin Stick Road. Dirt logging roads cross much of the property, along which several small clearings (> 0.5 ha) have formed meadows (Fig. 1). Depressions in these roads often form pools that provide ephemeral amphibian breeding habitats. Planted loblolly pine (*Pinus taeda* Linnaeus, 1753) dominates the uplands of the property, with interspersed sections of hardwood or mixed forest.

The northern property boundary runs along the Nottoway River for approximately 4 kilometers. In many portions of the property, the river is surrounded by high (up to 3 m) bluffs. Other portions of the river have rocky banks and bottoms and smaller bluffs. Black Branch Swamp also flows through the property for 4 km. In portions of Black Branch Swamp, manmade canals drain the water into distinct channels. In sections without canals, it forms a broader swamp. In at least one section, Black Branch Swamp is dammed by beavers (*Castor canadensis* Kuhl, 1820). Before it empties into the Nottoway River, Black Branch Swamp enters a high ravine. Water does not flow through the mouth of the stream during drier portions of the year.

Other unnamed streams and canals exist on the property. These streams are surrounded by swampland that holds water only during high-water events and wet portions of the year. Several streams flow from east to west in the northern section of the property before converging into a deep ravine and emptying into the Nottoway River. These streams have floodplains dominated by grasses and sedges. Along the northern and central sections of the property are several seasonally inundated bottomland forests. These swamps are dominated either by oak (*Quercus sp.*) and river birch (*Betula nigra* Linnaeus, 1753) or sweetgum (*Liquidambar styraciflua* Linnaeus, 1753), tupelo (*Nyssa sp.*), and red maple (*Acer rubrum* Linnaeus, 1753). Multiple ephemeral pools exist on the southern end of the property that provide further amphibian breeding habitat.

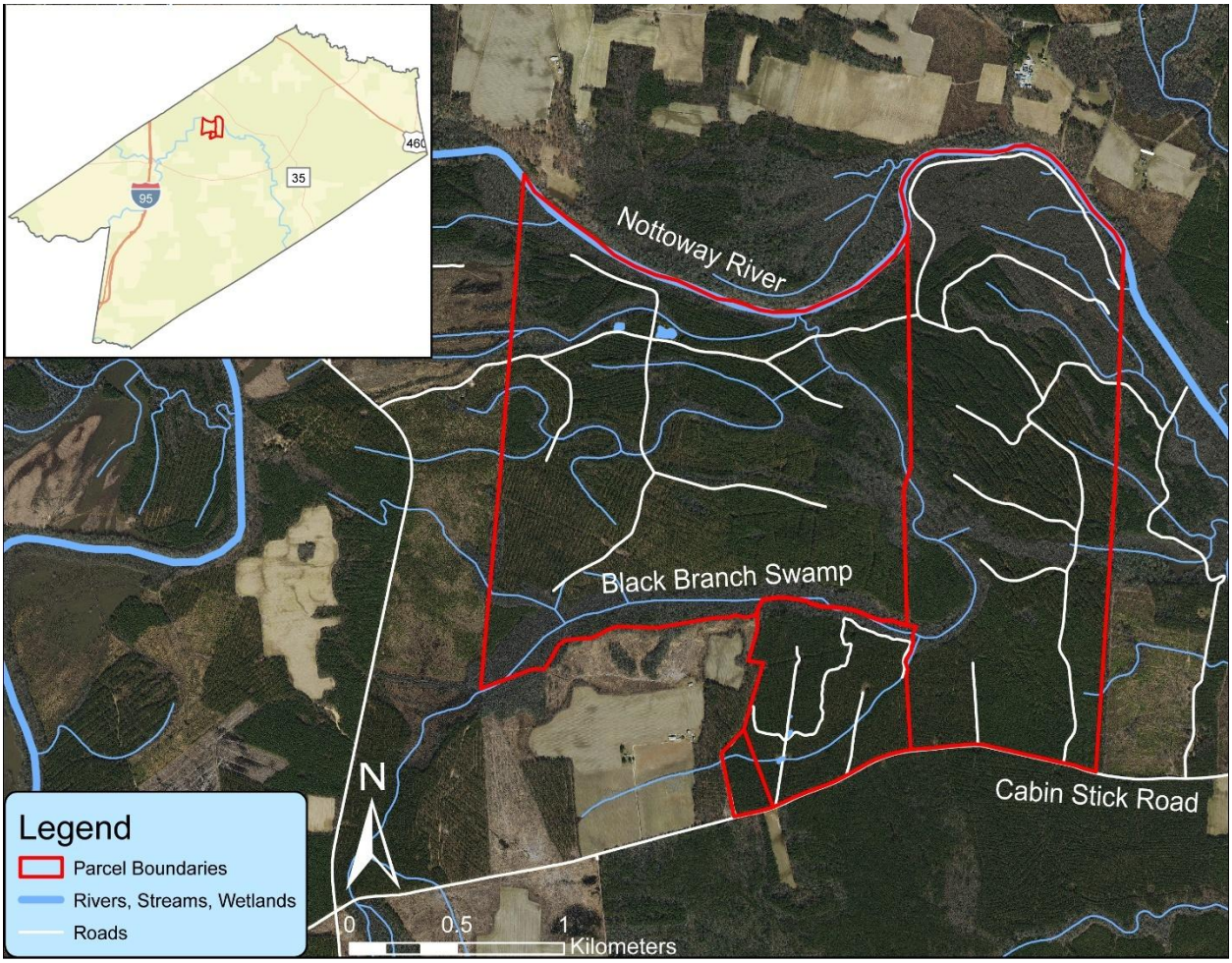

Figure 1. Map of Arch of the Nottoway Wildlife Management Area and surrounding area. The four parcels that make up the site are outlined in red. Roads are drawn in white and water bodies are drawn in blue. Inset shows the location of the WMA (red) in Sussex County. GIS data by VGIN (2021) and OpenStreetMaps Contributors et al. (2022).

In the north of the property are two manmade borrow pits. The western borrow pit is dry for most of the year, with only a small portion holding water year-round. Fish in this pit are mostly smaller species, including banded sunfishes (*Enneacanthus* sp.), mudminnows (*Umbra pygmaea* [DeKay, 1842]), and mosquitofish (*Gambusia holbrooki* Girard, 1859). The eastern borrow pit is deeper, holds water year-round in the northern and eastern portions, and contains larger fish, including sunfishes (*Lepomis sp.*), lake chubsuckers (*Erimyzon sucetta* [Lacepède, 1803]), largemouth bass (*Micropterus salmoides* [Lacepède, 1802]), and banded sunfishes (*Enneacanthus* sp.). In the southwestern portion of the eastern borrow pit, the water is shallower and ephemeral. Here a portion of the borrow pit is an open, grass and sedge-dominated wetland and another portion is a forested swamp dominated by pine (*Pinus sp.*), sweetgum and river birch. Buttonbush (*Cephalanthus occidentalis* Linnaeus, 1753) is common throughout both borrow pits.

Survey techniques and sampling effort

I sampled amphibians and reptiles on 60 separate days between June 2021 and June 2022, and an additional five days in March 2024, for a total of 559 person-hours (Table 1). To maximize

the number of species encountered, I utilized multiple survey methods, including visual encounter surveys, dip netting, road surveys, auditory surveys, artificial cover boards, and aquatic hoop traps.

The primary method of sampling included a combination of visual encounter and auditory surveys, following that of Weisenbeck et al. (2022). For visual encounters, I surveyed the property day and night by traversing the land and opportunistically flipping cover objects (e.g., rocks, logs, and artificial cover). To provide artificial cover to flip during sampling, I placed 24 cover boards made of varying sizes of rubber stall mats, plywood, or Ondura corrugated asphalt roofing across the property, primarily along roads and clearings.

I collected all amphibians and reptiles encountered for identification either by hand or net. I used dip nets in water bodies to capture aquatic amphibians. I conducted road surveys on rainy nights to encounter animals crossing public roads adjacent to the property. In each survey method, I either photographed animals (in-situ or in hand using a Ricoh [Tokyo, Japan] WG-6) and released them shortly after capture or retained them as voucher specimens.

Auditory surveys were conducted using two methods: opportunistically during visual encounter surveys and systematically with passive audio recorders (Audiomoth v1.1.0 and v1.2.0). During visual encounters, frog calls were recorded using an iPhone 11. I also deployed four passive audio recorders from June–November 2021 and February–June 2022 near wetlands to record frog calling activity. Audio loggers were set to record four times per night at two-minute intervals in 2021 and one-minute intervals in 2022. I adjusted the timing of recording throughout the season to always have one recording before sunset and three after sunset. I analyzed a subset of audio logger data by ear to identify all calling frogs (Table 1). I deposited representative audio recordings for each species in the Macaulay Library of Sounds, and accession numbers can be found in the annotated checklist.

I deployed aquatic traps in bodies of water across the property during several multi-day sampling events. I used hoop traps (Memphis Net & Twine [Memphis, TN) TN220 turtle net, 76 cm diameter with 5 cm mesh), Promar traps (Promar [Gardena, CA] TR-503 crawfish/bait trap, 60 cm by 30 cm), metal minnow traps (various brands, 40 cm by 18 cm with a 2.5 cm opening), and metal crayfish traps (Bass Pro Shops [Springfield, MO], 40 cm by 18 cm with a 5 cm opening). I baited hoop traps and Promar traps with either dry dog food (varying brands) or canned sardines. I baited metal crayfish and minnow traps with either canned sardines or chicken livers. Traps were partially submerged in water, leaving a pocket at the top to allow animals to breathe. I placed traps in the water for 1–4 consecutive days and checked them at least once daily.

To evaluate how sampling effort impacted observed biodiversity, I created rarefaction curves using the R package iNEXT (Chao et al., 2014; Hsieh et al., 2016). Curves were built using daily species incidence data; 95% confidence intervals were generated with 1000 bootstraps. Rarefaction curves should approach an asymptote when the total species richness for a site has been documented (Chao et al., 2014; Hsieh et al., 2016).

Specimen preservation

For most species, I collected at least one individual and preserved it to serve as a full-body voucher specimen. I photographed all animals dorsally, laterally, and ventrally in a light box prior to preservation using a Ricoh (Tokyo, Japan) WG-6. I euthanized specimens using tricaine methanesulfonate (MS-222; Simmons, 2015). I collected samples of liver tissue from each individual for future molecular analysis and stored them in RNAlater (Invitrogen [Waltham, MA]). I fixed specimens in 10% neutral buffered formalin and later transferred them to 70% ethanol. I

deposited specimens and tissue samples in the collections at the North Carolina Museum of Natural Sciences. Accession numbers for each species can be found in the annotated checklist.

Table 1. Summary of survey effort for June 2021 – March 2024. Survey time is the total time spent using various methods (i.e. visual encounter, dip-netting). Survey time is in person hours, which is the time spent surveying multiplied by the number of surveyors. Trap time is in trap days and is the total number of days traps were active multiplied by number of active traps. Audio Logger time is the number of minutes of analyzed audio recordings.

Month	Survey Time (person hours)	Trap Time (trap days)	Audio Loggers (minutes)
January	18	1	0
February	47	0	170
March	59.5	0	351
April	53.5	22	149
May	84.5	59	103
June	25	0	183
July	54	19	480
August	61.5	49	344
September	45.5	34	112
October	74.5	12	0
November	8	0	0
December	28	14	0
Total	559	210	1892

Conservation status and nomenclature

The conservation status of amphibians and reptiles reported in this study follows the criteria of the Virginia Department of Wildlife Resources (DWR) 2025 State Wildlife Action Plan (DWR, 2025b) and the Virginia Department of Conservation and Recreation Division of Natural Heritage (DCR-DNH) list of state rare and watchlist species (Roble, 2025). See these sources for an in-depth breakdown of ranking criteria. In general, a lower numerical rank indicates higher conservation need. For amphibian and reptile nomenclature, I follow the Society for the Study of Amphibians and Reptiles' 9th edition Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico (Nicholson, 2025).

RESULTS

I documented a total of 51 amphibian and reptile species at the Arch of the Nottoway WMA, including 19 frogs, 8 salamanders, 11 snakes, 4 lizards, and 9 turtles. Species accumulation began to level off towards the end of the survey, and the last new species was encountered on 13 May 2022. However, the rarefaction curve failed to reach an asymptote, indicating that more species could be documented with additional sampling (Fig. 2).

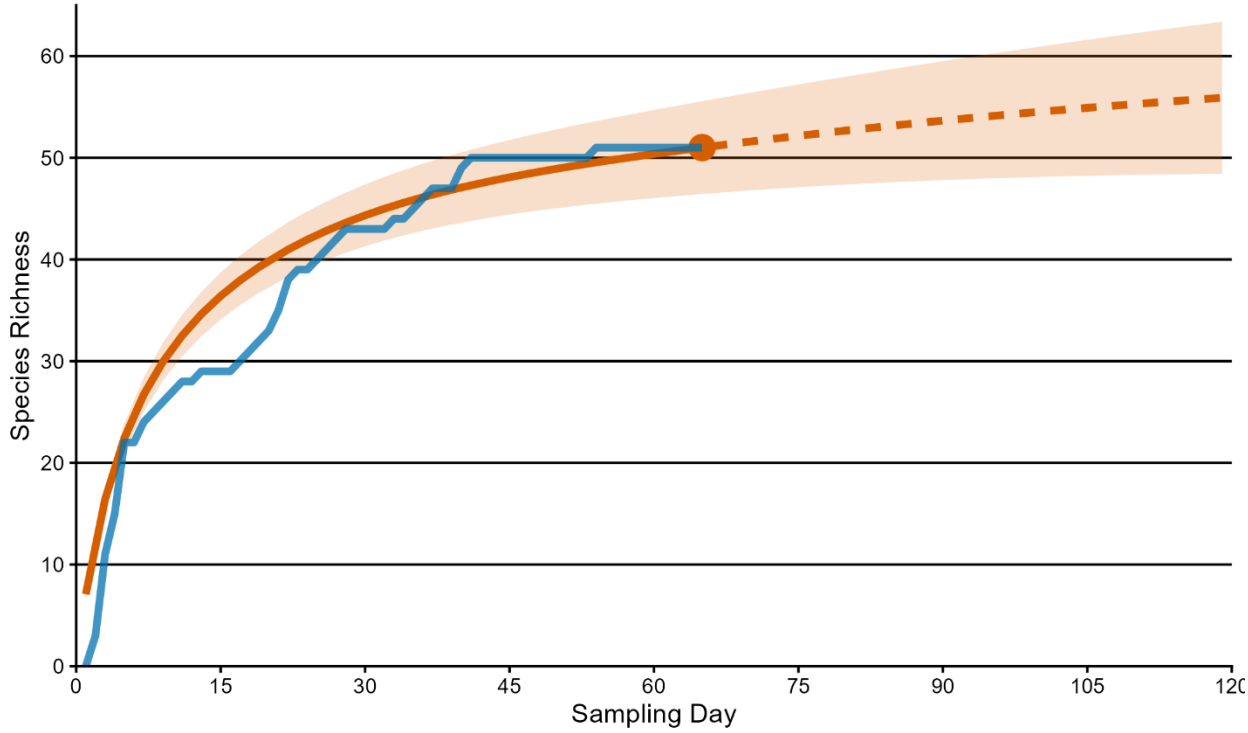

Figure 2. Extrapolated rarefaction curve (orange) and observed species accumulation plot (blue) showing amphibian and reptile species richness as a function of sampling effort. Shaded area represents 95% confidence intervals for the rarefaction curve.

Annotated checklist

Frogs (order Anura)

Eastern cricket frog (*Acris crepitans* Baird, 1854; Fig. 3A)

Acris crepitans were active year-round in virtually every wetland on the property and nearby uplands. The species called from April through August throughout most wetlands on the property. In most wetlands it called concurrently with *Acris gryllus.* The species was more

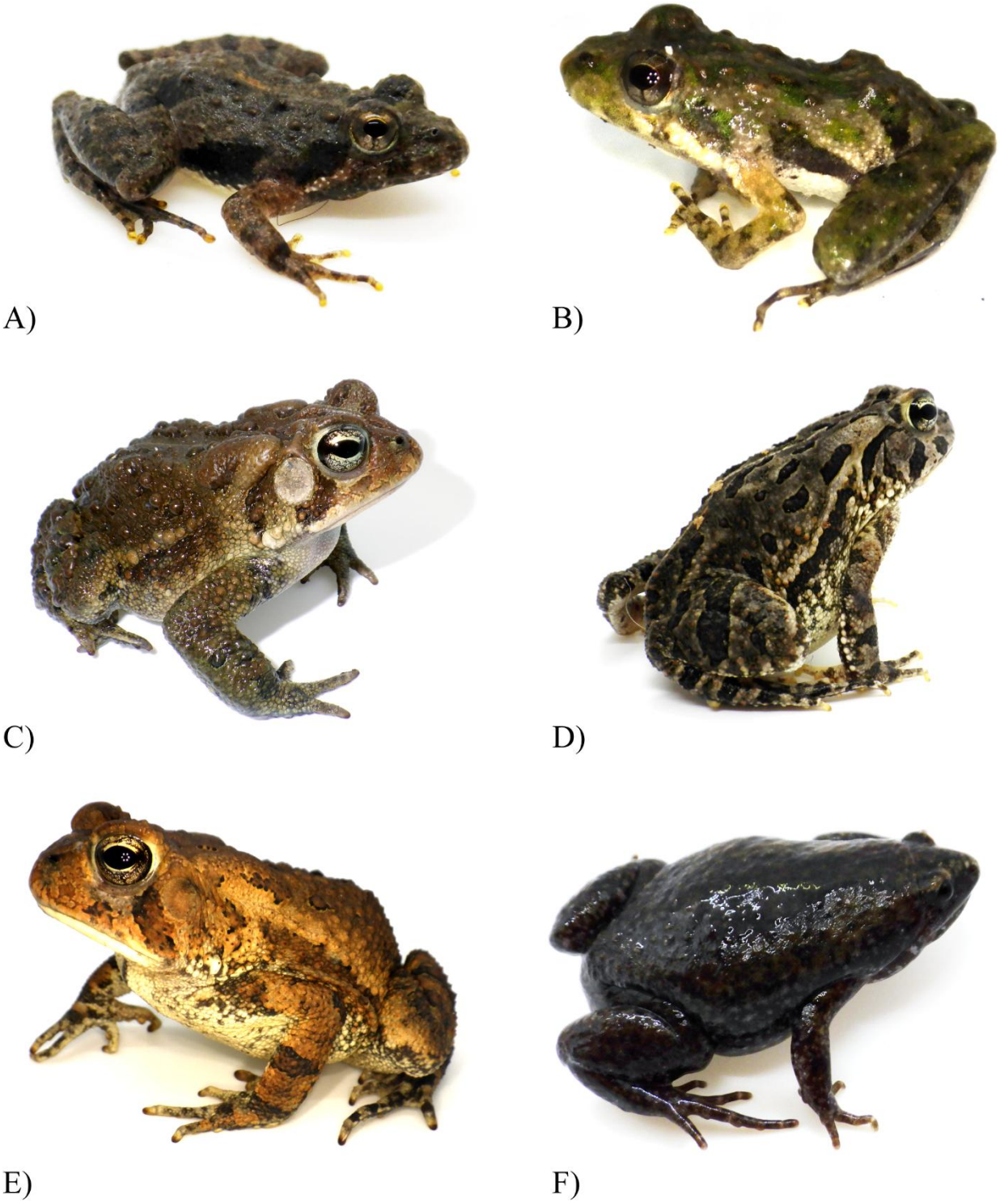

Figure 3. Frogs at Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Acris crepitans* (eastern cricket frog); B: *Acris gryllus (*southern cricket frog); C: *Anaxyrus americanus* (American toad); D: *Anaxyrus fowleri* (Fowler's toad); E: *Anaxyrus terrestris* (southern toad); F: *Gastrophryne carolinensis* (eastern narrow-mouthed toad). Images are not to scale.

commonly encountered than *A. gryllus* in the swamps and canals along the eastern portion of the property.
Specimens: NCSM 107857.
Recordings: ML506562951, ML506563071, ML506563231, ML506563271; ML506565401; ML506565501; ML506565621; ML506567231; ML506567291.

Southern cricket frog (*Acris gryllus* [LeConte, 1825]; Fig. 3B)

Acris gryllus were active year-round in virtually every wetland on the property and in upland woods. The species called from March through August throughout most wetlands on the property. In most wetlands it called concurrently with *Acris crepitans*. The species was more commonly encountered than *A. crepitans* in the pine woods and ephemeral wetlands along the southern portion of the property.
Specimens: NCSM 107869, NCSM 107871.
Recordings: ML506563071, ML506563171, ML506563201, ML506563231, ML506563271; ML506565401; ML506565501; ML506565621; ML506566011; ML506566051; ML506566161; ML506567151; ML506567231; ML506567291.

American toad (*Anaxyrus americanus* [Holbrook, 1836]; Fig. 3C)

Anaxyrus americanus called from ditches and pools along Cabin Stick Road and logging roads on the property. The species called from February through May.
Specimens: NCSM 108474, NCSM 108481.
Recordings: ML506564091; ML506564161; ML506564971; ML506565321; ML506565811; ML506565981.

Fowler's toad (*Anaxyrus fowleri* [Hinckley, 1882]; Fig. 3D)

Anaxyrus fowleri called from April through July in wetlands including the borrow pits, the Nottoway River, and ditches and pools along logging roads and Cabin Stick Road. Nonbreeding individuals and juveniles could be found in upland woods throughout much of the property from April through September.
Specimens: NCSM 107855, NCSM 108464.
Recordings: ML506563041; ML506564971; ML506565321; ML506565501; ML506565541; ML506565621; ML506565641; ML506565681; ML506565731.

Southern toad (*Anaxyrus terrestris* [Bonnaterre, 1789]; Fig. 3E)

Anaxyrus terrestris called from March through May in the borrow pits, pools along logging roads, and in one case an ephemeral swamp in the northern portion of the property. *Anaxyrus terrestris* were also found outside of the breeding season in July, September, and October along Cabin Stick Road and in an ephemeral swamp in the north of the property. Introgressive hybridization has been documented in all three toad species found at the WMA (Volpe, 1959; Green & Parent, 2003; Cobb & Oaks, 2024), and many of the individuals I encountered were morphologically ambiguous. The hybridization of toads in Virginia has been scarcely studied, and

this area, where three species are sympatric, may present an interesting opportunity for further study.
Specimens: NCSM 107868.
Recordings: ML506564931; ML506565321; ML506565731; ML506565811.

Cope's gray treefrog (*Dryophytes chrysoscelis* [Cope, 1880]; Fig. 4A)

Dryophytes chrysoscelis were found from April through October, primarily in and around breeding wetlands but occasionally in upland woods. Juveniles were common in upland pine and mixed woods in September and October. The species called from late April through August in wetlands across the property including the borrow pits, portions of Black Branch Swamp, bottomland forests in the northern portions of the property, pools on and along logging roads, ditches along Cabin Stick Road, and ephemeral wetlands in the southwestern portion of the property
Specimens: NCSM 107859, NCSM 108466.
Recordings: ML506563011, ML506563041, ML506563121, ML506563171, ML506563231, ML506563271, ML506563381; ML506564971; ML506565441; ML506565501; ML506565541; ML506565621; ML506565681; ML506565731; ML506565781; ML506565811; ML506565891; ML506565931; ML506565981; ML506566011; ML506566161; ML506566241; ML506567151.

Cope's gray x pine woods treefrog hybrid (*Dryophytes chrysoscelis x D. femoralis*; Fig. 4E)

Two male hybrid treefrogs were identified on the property based on an abnormal mating call resembling both *D. chrysoscelis* and *D. femoralis* (see Weisenbeck et al., 2025 for a detailed call description). One individual called from the western borrow pit on 4 and 5 August, before it was collected. Another called from an ephemeral wetland in the southwestern portion of the property from 25–27 May. In both instances, the hybrids called among large choruses containing both *Dryophytes femoralis* and *Dryophytes chrysoscelis.* The hybrid identity of the individual found in August was confirmed by molecular data (Weisenbeck et al., 2025).
Specimens: NCSM 107863.
Recordings: ML506563271; ML506567151.

Green treefrog (*Dryophytes cinereus* [Schneider, 1799]; Fig. 4B)

Dryophytes cinereus were found on the edges of wetlands in several portions of the property in February, March, May, and October. The species was only recorded calling twice; both times in July on an audio logger directed over a pool on a logging road and the unnamed creek in the southern portion of the property.
Specimens: NCSM 107872.

Pine woods treefrog (*Dryophytes femoralis* [Daudin, 1800]; Fig. 4C)

Dryophytes femoralis were found from April through October in and around breeding wetlands and in upland woods. Juveniles and adults were particularly abundant along roads and in

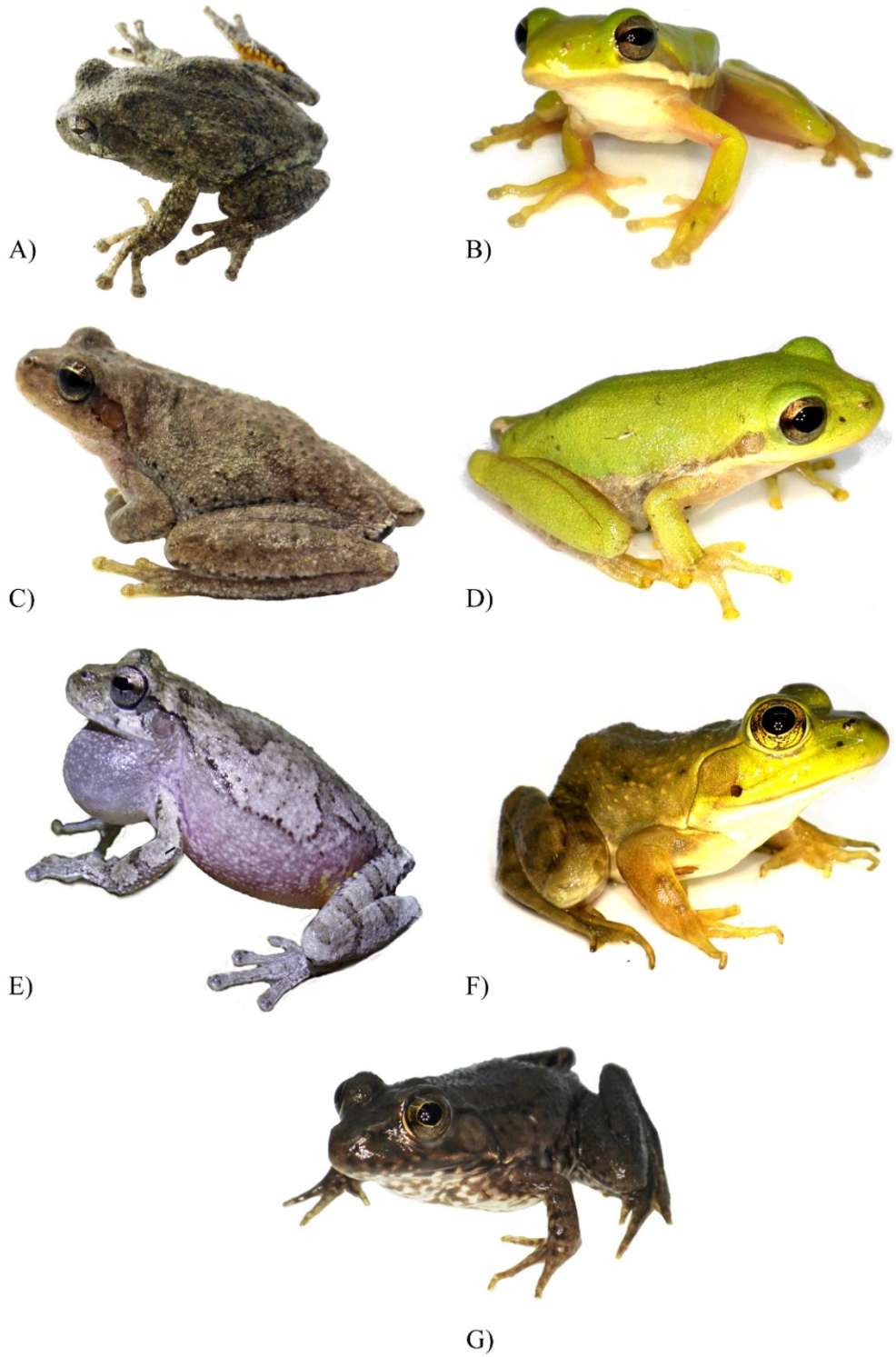

Figure 4. Frogs at Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Dryophytes chrysoscelis* (Cope's gray treefrog); B: *Dryophytes cinereus* (green treefrog); C: *Dryophytes femoralis* (pine woods treefrog); D: *Dryophytes squirellus* (squirrel treefrog); E: *Dryophytes chrysoscelis x D. femoralis* (Cope's gray treefrog x pine woods treefrog); F: *Lithobates catesbeianus* (North American bullfrog); G: *Lithobates clamitans* (North American green frog). Images are not to scale.

upland woods in September and October. The species called May through August from both borrow pits, portions of Black Branch Swamp, bottomland forests in the northern portion of the property, pools on the logging roads, and the ephemeral wetlands in the southern portion of the property.
Specimens: NCSM 107858, NCSM 108472.
Recordings: ML506563121, ML506563171, ML506563231, ML506563271; ML506565641; ML506565681; ML506565731; ML506566051; ML506566161; ML506566241; ML506567151.

Squirrel treefrog (*Dryophytes squirellus* [Daudin, 1800]; Fig. 4D)

A single juvenile *Dryophytes squirellus* was found in a clearing above the Nottoway River in October. The individual had a heavy load of parasitic worms. This species was not heard calling and no breeding habitats were identified.
Specimens: NCSM 107865.

Eastern narrow-mouthed toad (*Gastrophryne carolinensis* [Holbrook, 1836]; Fig. 3F)

Gastrophryne carolinensis were found from April through October in the borrow pits, pools along logging roads, an unnamed creek in the southern portion of the property, and uplands near these wetlands. The species called from these same wetlands from June through August.
Specimens: NCSM 107856, NCSM 108473.
Recordings: ML506563091; ML506563121; ML506563171; ML506563381; ML506567291.

North American bullfrog (*Lithobates catesbeianus* [Shaw, 1802]; Fig. 4F)

Lithobates catesbeianus were found year-round in most wetlands across the property, including along the Nottoway River. The species called from April through August in the borrow pits and an unnamed creek in the southern portion of the property.
Specimens: NCSM 107870.
Recordings: ML506567291.

North American green frog (*Lithobates clamitans* [Latreille, 1801]; Fig. 4G)

Lithobates clamitans were found year-round in virtually every wetland on the property except on the Nottoway River. The species called from April through August in wetlands across the property, including the borrow pits, Black Branch Swamp and other creeks, and ephemeral pools in southwestern portion of the property.
Specimens: NCSM 107862.
Recordings: ML506563071, ML506563171, ML506563231, ML506563271; ML506567171; ML506567231; ML506567291.

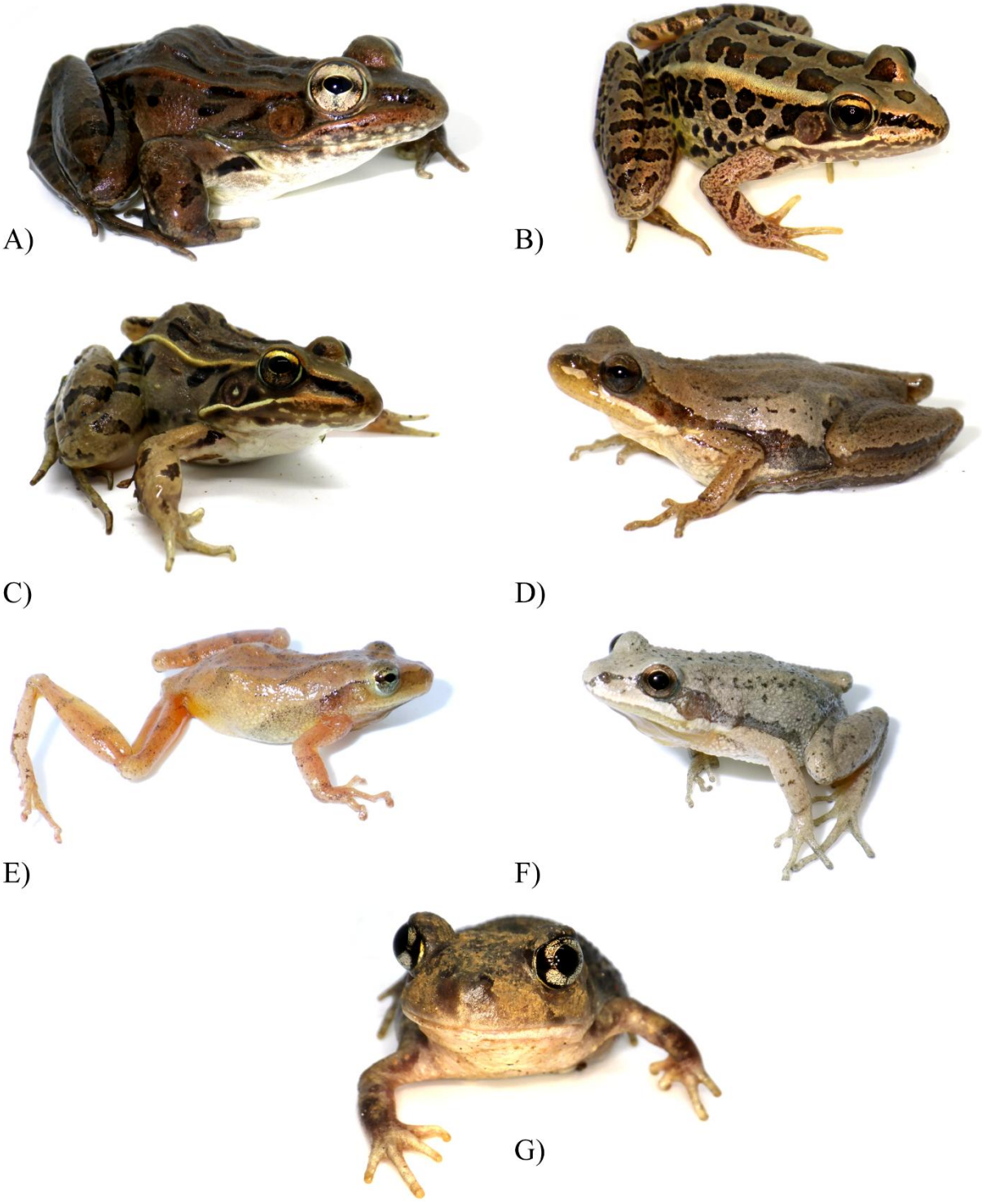

Figure 5. Frogs Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Lithobates kauffeldi* (Atlantic Coast leopard frog); B: *Lithobates palustris* (pickerel frog); C: *Lithobates sphenocephalus* (southern leopard frog); D: *Pseudacris brimleyi* (Brimley's chorus frog); E: *Pseudacris crucifer* (spring peeper); F: *Pseudacris feriarum* (upland chorus frog); G: *Scaphiopus holbrookii* (eastern spadefoot). Images are not to scale.

Atlantic Coast leopard frog (*Lithobates kauffeldi* [Feinberg et al., 2014]; Fig. 5A)

Lithobates kauffeldi were found throughout much of the property. The species called from February through April in the bottomland forests in the northeastern portion of the property, the eastern borrow pit, Black Branch Swamp, and from ditches along logging roads. The species frequently called together with *L. sphenocephalus* and *L. palustris*. Frogs morphologically consistent with *L. kauffeldi* were found outside of the breeding season in the western borrow pit, a clearing along the Nottoway River, and on a logging road. The breeding habitat of *L. kauffeldi* at the WMA differs from the riparian cypress/gum swamps known for the species elsewhere in Virginia (Schlesinger et al., 2018).
Specimens: NCSM 108483, NCSM 108484.
Recordings: ML506567331; ML506567961.

Pickerel frog (*Lithobates palustris* [LeConte, 1825]; Fig. 5B)

Lithobates palustris were relatively uncommon. Individuals were found in October on the bank of the Nottoway River and in March in the borrow pits. The species could be heard calling sporadically from February through April in the borrow pits, bottomland forests, and Black Branch Swamp.
Specimens: NCSM 107864.
Recordings: ML506566271.

Southern leopard frog (*Lithobates sphenocephalus* [Cope, 1886]; Fig. 5C)

Lithobates sphenocephalus were more common than *L. kauffeldi* and were found year-round in virtually every wetland on the property. They called from many wetlands, including the borrow pits, bottomland forests, Black Branch Swamp, ephemeral wetlands in the southwestern portion of the property, and pools and ditches along logging roads. Primary breeding calls were from February through April, but the species also called in August and September.
Specimens: NCSM 107860, NCSM 107861.
Recordings: ML506563231, ML506564091; ML506564801; ML506564971; ML506566271; ML506567151; ML506567331; ML506567411.

Brimley's chorus frog (*Pseudacris brimleyi* Brandt and Walker, 1933; Fig. 5D)

Pseudacris brimleyi called from grass and sedge-dominated wetlands in the center of the property, grassy portions of Black Branch Swamp and unnamed creeks. The species was recorded from 18 February through 31 March.
Specimens: NCSM 108476.
Recordings: ML506563931; ML506564181; ML506564291; ML506564911.

Spring peeper (*Pseudacris crucifer* [Wied-Neuwied, 1838]; Fig. 5E)

Pseudacris crucifer were heard calling from upland areas on warm days from October–January. In February, the species began calling in large choruses from wetlands throughout most

of the property and was the most frequent spring caller. Choruses tapered off in May, with the species only calling on cold, wet days. Breeding calls were recorded from 18 February to 24 May.
Specimens: NCSM 107867, ML506564041.
Recordings: ML506563421, ML506563451, ML506563951, ML506563991; ML506564181; ML506564221; ML506564291; ML506564801; ML506564971; ML506565251; ML506566051; ML506566271; ML506567091; ML506567331; ML506567411.

Upland chorus frog (*Pseudacris feriarum* [Baird, 1854]; Fig. 5F)

Pseudacris feriarum called primarily from pools on the logging roads. The species called only during February and March.
Specimens: NCSM 108475, NCSM 108480.
Recordings: ML506564041; ML506564161; ML506564801.

Eastern spadefoot (*Scaphiopus holbrookii* [Harlan, 1835]; Fig. 5G)

Scaphiopus holbrookii were found on one night in October after heavy rains. The species was found near ephemeral wetlands in the southern portion of the property. The species was never recorded calling and breeding habitats were not identified. Pearson (1955) reported that *Scaphiopus holbrookii* traveled up to 400 meters from their home ranges to breeding pools. Given that both *S. holbrookii* individuals were found near an ephemeral pool and that these wetlands are the only prominent breeding sites within 400 meters, it seems likely that they serve as breeding habitat for the species.
Specimens: NCSM 107866.

Salamanders (order Caudata)

Spotted salamander (*Ambystoma maculatum* [Shaw, 1802]; Fig. 6A)

Ambystoma maculatum migrate to breeding habitat in late winter and early spring (Blanchard, 1930). During the breeding season this species was found in wetlands across much of the property, including the ephemeral swamps in the north, ruts on the road, the wetlands in the south, and Black Branch Swamp. Adults were found from 2 February to 23 February. Eggs were first found on 18 February and hatched by 14 March.
Specimens: NCSM 107853.

Marbled salamander (*Ambystoma opacum* [Gravenhorst, 1807]; Fig. 6B)

Ambystoma opacum migrate to breeding habitat in the fall in dry wetlands and females overwinter with their eggs, which hatch in late winter as pools fill with water (Noble & Brady, 1933). Adults were found in breeding migrations in ephemeral swamps on 7 and 9 October. Larvae were first found on 4 February and occurred in wetlands including the ephemeral swamps in the north, ruts on the road, ephemeral wetlands in the south, and Black Branch Swamp. Nonbreeding adults were also found under logs and cover boards in upland areas in July and February through April.
Specimens: NCSM 107848, NCSM 107849.

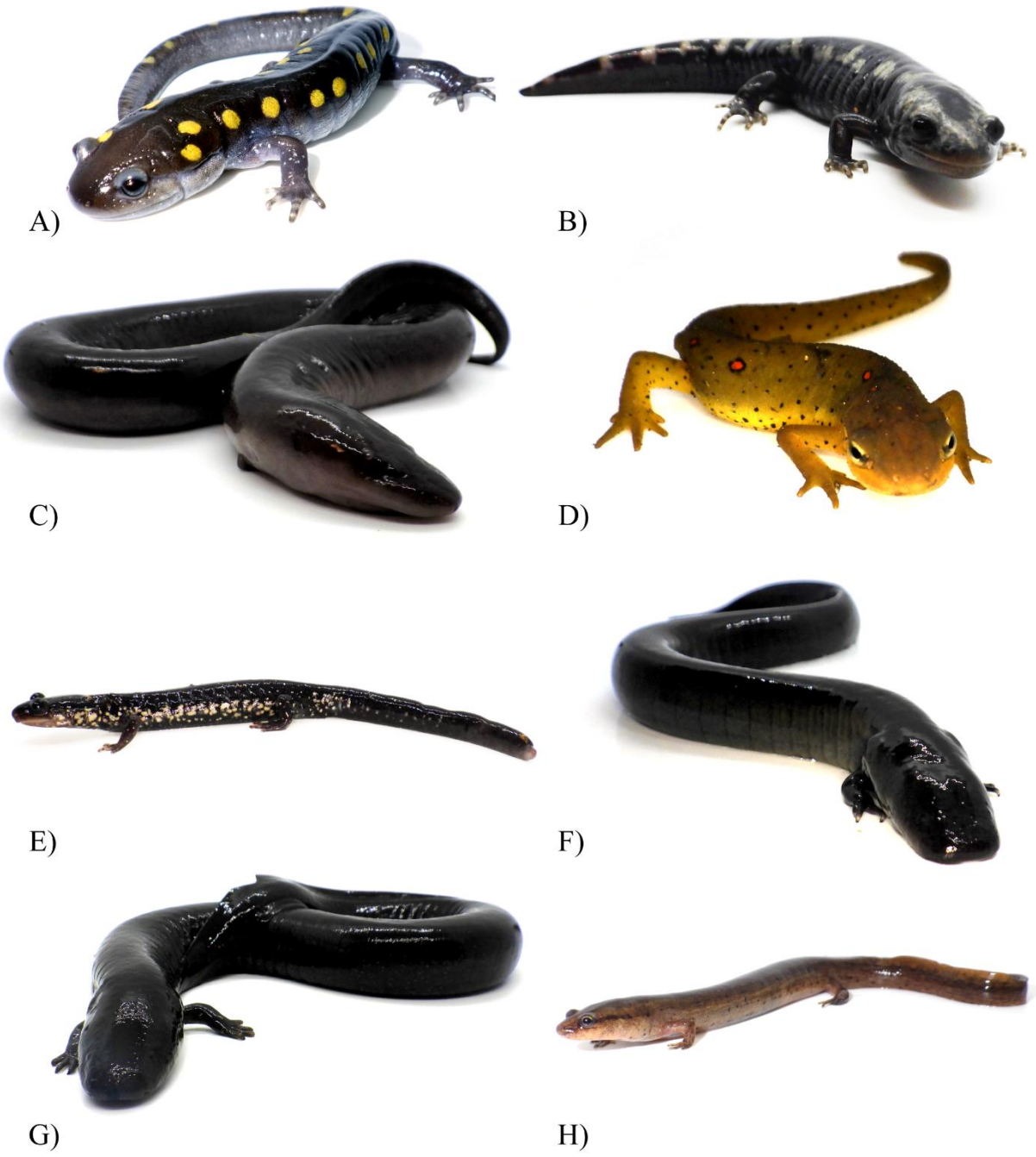

Figure 6. Salamanders at Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Ambystoma maculatum* (spotted salamander); B: *Ambystoma opacum* (marbled salamander); C: *Amphiuma means* (two-toed amphiuma); D: *Notophthalmus viridescens viridescens* (red-spotted newt); E: *Plethodon chlorobryonis* (Atlantic Coast slimy salamander); F: *Siren intermedia* (lesser siren); G: *Siren lacertina* (greater siren); H: *Stereochilus marginatus* (many-lined salamander). Images are not to scale.

Two-toed amphiuma (*Amphiuma means* Garden, 1821; Fig. 6C)

Amphiuma means were caught in Black Branch Swamp and in unnamed streams and canals in the south. The species was encountered in April, July, and October.
Specimens: NCSM 107843.

Red-spotted newt (*Notophthalmus viridescens viridescens* [Rafinesque, 1820]; Fig 6D)

Notophthalmus viridescens viridescens was the most encountered salamander species on the property and was found in every month of the year. Adults could be found in many wetlands on the property but were most abundant in the south and in the western borrow pit. The terrestrial juvenile phase, efts, were found occasionally in upland and bottomland woods.
Specimens: NCSM 107850.

Atlantic Coast slimy salamander (*Plethodon chlorobryonis* Mittleman, 1951; Fig. 6E)

Plethodon chlorobryonis were found in upland woods throughout much of the property. Adults were found in October and February through April, and juveniles were found in March and April.
Specimens: NCSM 107851.

Lesser siren (*Siren intermedia* Barnes, 1826; Fig. 6F)

Two *Siren intermedia* were caught in the western borrow pit using minnow traps. Individuals were identified as *Siren intermedia* by the presence of ≤33 costal grooves (See Fedler et al., 2023 for a morphometric analysis of the *Siren*). The species was found in April and September. *Siren intermedia* is identified by Virginia's 2025 State Wildlife Action Plan as a species of high conservation need (tier IIIa; DWR, 2025b) and is listed on DCR-DNH's state rare animal list (GNRS2S3). *Siren intermedia* is patchily distributed, but it is often abundant where found (Leja, 2005). Due to their secretive nature, understanding siren population trends and conservation has proven difficult (Leja, 2005) and Mitchell & Reay (1999) list its conservation status as indeterminate. Major threats to the species include degradation, fragmentation, pollution of wetland habitats (Leja, 2005; Petranka, 1998; Mitchell & Gibbons, 2010), and invasive species, particularly feral hogs (Mitchell & Gibbons, 2010). *Siren intermedia* is susceptible to the fungal pathogen *Batrachochytrium dendrobatidis* (*Bd*; Chatfield et al., 2012), though it is unclear whether the disease is responsible for declines in the species and Thompson *et al.* (2019) found no evidence of infection among Lesser Sirens at Fort A.P. Hill in Caroline County, Virginia, despite the prevalence of the pathogen at the site.
Specimens: NCSM 107845, NCSM 108486.

Greater siren (*Siren lacertina* Österdam, 1766; Fig. 6G)

A single adult *Siren lacertina* was caught active at night in the western borrow pit in August. This individual was identified as *Siren lacertina* by the presence of >35 costal grooves (Fedler et al., 2023). *Siren lacertina* is identified by Virginia's 2025 State Wildlife Action Plan as a species of moderate conservation need (tier IVa; DWR, 2025b) and is listed on DCR-DNH's

state animal watchlist (G5S3). Virginia is on the northern edge of the range of *S. lacertina*, where the species may be rare or locally abundant (Hendricks, 2005). Like *S. intermedia*, understanding *S. lacertina* population trends and conservation has proven difficult due to their secretive nature (Hendricks, 2005) and Mitchell & Reay (1999) list its conservation status as indeterminate. *Siren lacertina* faces many of the same threats as *S. intermedia*, including pollution and degradation of wetland habitat, invasive feral hogs (Mitchell & Gibbons, 2010), as well as *Bd* (Chatfield et al., 2012).
Specimens: NCSM 107844.

Many-lined salamander (*Stereochilus marginatus* [Hallowell, 1856]; Fig. 6H)

Stereochilus marginatus were relatively common in Black Branch Swamp, where they were found in October, December, February, and March. Adults were found in the broader swamp, whereas a larva was found in a stream channel. Almost all individuals were found under logs at the edge of the water. *Stereochilus marginatus* is not documented in Sussex County in databases at the Virginia Herpetological Society (VHS, 2025) and the Virginia Fish and Wildlife Information System (DWR, 2016), or the Virginia herp atlases of Mitchell & Reay (1999) and Tobey (1985). VertNet (http://vertnet.org/) returned no results when searching for this species in the county at time of writing. Thus, the species represents a new county record. *Stereochilus marginatus* reaches its northern limit in Virginia and records in the state are sparse, with a Vertnet search returning only 19 museum records. This record fills in the distributional gap between the westernmost records in Greensville County and eastern records in Prince George and Surry counties. The nearest *S. marginatus* record is located approximately 36 km northeast near Spring Grove, Surry County (Hayslett et al., 1992). *Stereochilus marginatus* is identified by Virginia's 2025 State Wildlife Action Plan as a species of moderate conservation need (tier IVa; DWR, 2025b) and is listed on DCR-DNH's state animal watchlist (G5S3). The biology of the species is poorly understood (Ryan, 2005) and little is known of its conservation status or range (Mitchell & Reay, 1999; Petranka, 1998). Loss and degradation of wetland habitats are likely the main threats to this species (Ryan, 2005; Mitchell & Gibbons, 2010).
Specimens: NCSM 107834, NCSM 107852.

Snakes (Suborder Serpentes)

Eastern copperhead (*Agkistrodon contortrix* [Linnaeus, 1766]; Fig. 7A)

Agkistrodon contortrix were found in ephemeral wetlands and clearings at several sites across the property. The species was found in September and October.

Eastern wormsnake (*Carphophis amoenus amoenus* [Say, 1825]; Fig. 7B)

Carphophis amoenus amoenus were commonly found under cover and in leaf litter in upland forests and clearings throughout much of the property. One individual was found consuming an earthworm on the bank of the Nottoway River at night. The species was encountered in August, October, April, and May.
Specimens: NCSM 107839.

Figure 7. Snakes at Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Agkistrodon contortrix* (eastern copperhead)*;* B: *Carphophis amoenus* (eastern wormsnake); C: *Coluber constrictor constrictor* (northern black racer); D: *Diadophis punctatus edwardsii* (northern ring-necked snake); E: *Nerodia erythrogaster* (plain-bellied watersnake); F: *Nerodia sipedon sipedon* (northern watersnake); G: *Nerodia taxispilota* (brown watersnake); H: *Pantherophis quadravittatus* (yellow ratsnake). Images are not to scale.

Northern black racer (*Coluber constrictor constrictor* Linnaeus, 1758; Fig. 7C)

Coluber constrictor constrictor were found in upland pine woods throughout much of the property. One juvenile was found with a little brown skink (*Scincella lateralis* [Say, 1822]) in its stomach. The species was found in April through June and in October.
Specimens: NCSM 108477.

Northern ring-necked snake (*Diadophis punctatus edwardsii* [Merrem, 1820]; Fig. 7D)

A single juvenile *Diadophis puncatus edwardsii* was encountered in a hardwood upland forest along the Nottoway River in July.
Specimens: NCSM 107838.

Plain-bellied watersnake (*Nerodia erythrogaster* [Forster, 1771]; Fig. 7E)

Nerodia erythrogaster were primarily encountered in pools and ditches along logging roads, particularly in the southern portion of the property, and in a swampy portion of the eastern borrow pit. One individual was found consuming a southern leopard frog. The species was encountered in April, May, and October.
Specimens: NCSM 107836.

Northern watersnake (*Nerodia sipedon sipedon* [Linnaeus, 1758]; Fig. 7F)

Nerodia sipedon sipedon were common in wetlands throughout the property, including along the Nottoway River, borrow pits, canals, and streams. The species was encountered from May through September. One individual was found consuming a southern leopard frog.
Specimens: NCSM 107837.

Brown watersnake (*Nerodia taxispilota* [Holbrook, 1838]; Fig. 7G)

Nerodia taxispilota were commonly found in and around a rocky portion of the Nottoway River in July and August. *Nerodia taxispilota* is not documented in Sussex County in either Virginia database (VHS, 2025, DWR, 2024c), herp atlases (Mitchell & Reay, 1999; Tobey, 1985), or on VertNet (http://vertnet.org/). Thus, the species represents a new county record. Mitchell & Reay (1999) notes two areas of distribution for *N. taxispilota*: the central Coastal Plain near Chesterfield, Henrico, and Charles City counties as well as the far southeastern Virginia cities of Virginia Beach, Norfolk, Chesapeake, and Suffolk, though they note that this may be due to insufficient sampling effort. The nearest museum record (NCSM 73409) is located within the central Coastal Plain group, 28.7 km NNW on the Appomattox River between Petersburg and Colonial Heights. Recent records have partially filled in the gaps between these two populations (Anonymous, 2021). However, the record from Arch of the Nottoway WMA represents a significant range extension to the southwest of known populations. To my knowledge, this also represents the first record of the species on the Nottoway River in Virginia.
Specimens: NCSM 107835.

Yellow ratsnake (*Pantherophis quadravittatus* [Holbrook, 1836]; Fig. 7H)

Pantherophis quadravittatus were commonly found in upland woods and the edges of ephemeral wetlands throughout much of the property. The species was found from May through October. Burbrink et al. (2021a) concluded that ratsnake populations southeast of the Fall Line belong to the eastern ratsnake clade, which they referred to as *Pantherophis alleghaniensis* (Holbrook, 1836). Hillis & Wüster (2021) and Burbrink et al. (2021b) revised this taxonomy, changing *P. alleghaniensis* to *P. quadravittatus*. Although there is debate about the placement of members of the *P. obsoletus* complex as a distinct species, those from the Mapledale Site likely belong to the clade called *P. quadravittatus* (Burbrink et al., 2021b) or *P. obsoletus quadravittatus* (Hillis & Wüster, 2021; Hillis, 2022). Taxonomic placement is further complicated by a wide hybrid zone between *P. quadravittatus* and the central clade, now referred to as *P. alleghaniensis,* that likely encompasses the region (Burbrink et al., 2021a). Further genomic data are needed to confidently identify the ratsnakes of the region.
Specimens: NCSM 108463.

DeKay's brownsnake (*Storeria dekayi* [Holbrook, 1839]; Fig. 8A)

A single *Storeria dekayi* was found on the edge of an ephemeral pool in the pine woods near the center of the property in March.
Specimens: NCSM 108478.

Red-bellied snake (*Storeria occipitomaculata* [Storer, 1839]; Fig. 8B)

A juvenile *Storeria occipitomaculata* was found under pine straw in a clearing along the eastern borrow pit in March.
Specimens: NCSM 108482.

Eastern smooth earthsnake (*Virginia valeriae valeriae* Baird & Girard, 1853)

A single dead individual was found in a clearing along the eastern borrow pit in August. *Virginia valeriae valeriae* is not listed as occurring in Sussex County in either Virginia database (VHS, 2025, DWR, 2024a), herp atlases (Mitchell & Reay, 1999; Tobey, 1985), or on VertNet (http://vertnet.org/). Thus, this species represents a new county record. *Virginia valeriae valeriae* is relatively widely distributed in the northeastern parts of Virginia, but is patchily distributed in the southern portions of the state (Mitchell & Reay, 1999). The species is recorded in three of the surrounding counties: Southampton, Prince George, and Surry. The nearest record (MVZ-Herp 147510) is located approximately 31 km southeast in Southampton County.
Specimens: NCSM 108471.

Lizards (Suborder Lacertilia)

Common five-lined skink (*Plestiodon fasciatus* [Linnaeus, 1758]; Fig. 8C)

A single juvenile *P. fasciatus* was encountered under a cover board along the shore of the eastern borrow pit in October.

Specimens: NCSM 107842.

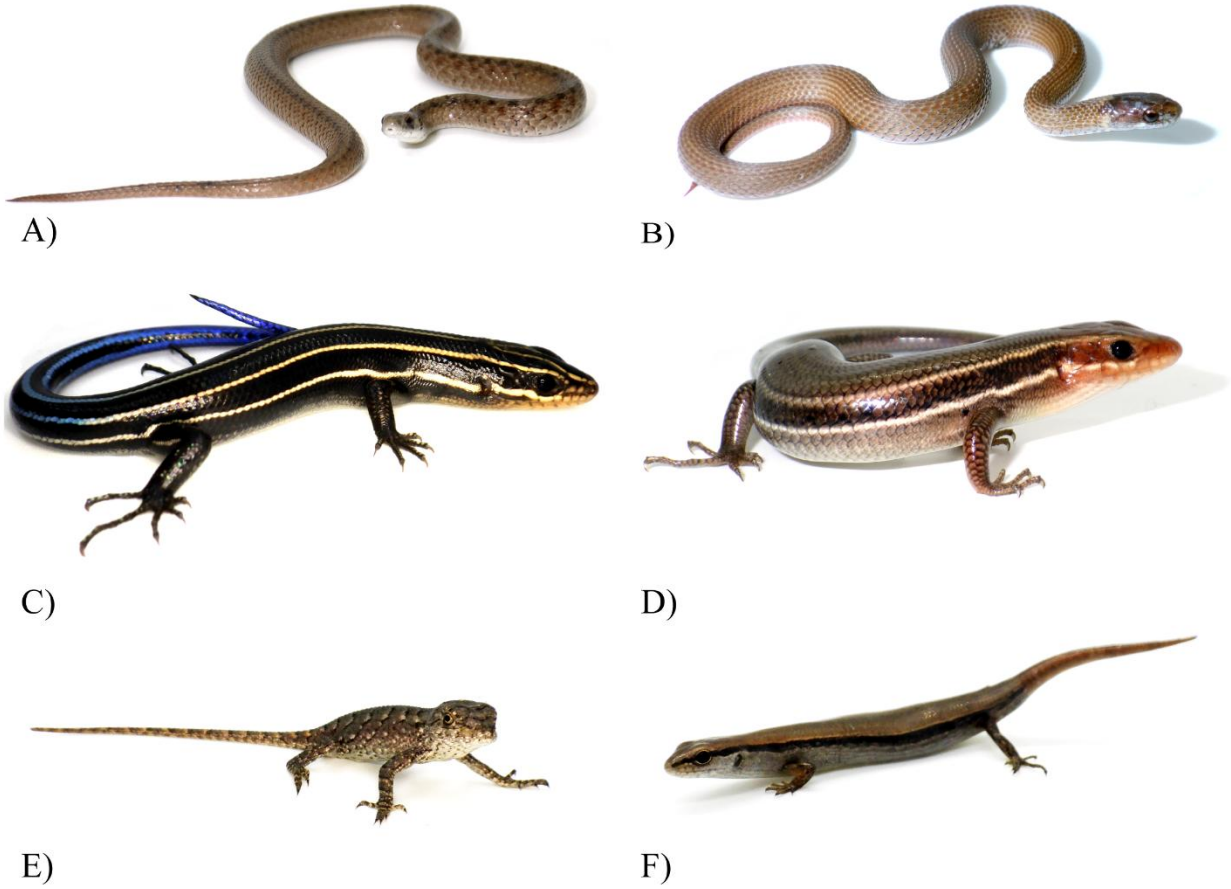

Figure 8. Snakes and lizards at Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Storeria dekayi* (DeKay's brownsnake); B: *Storeria occipitomaculata* (red-bellied snake); C: *Plestiodon fasciatus* (common five-lined skink) D: *Plestiodon inexpectatus* (southeastern five-lined skink); E: *Sceloporus undulatus* (eastern fence lizard); F: *Scincella lateralis* (little brown skink). Images are not to scale.

Southeastern five-lined skink (*Plestiodon inexpectatus* [Taylor, 1932]; Fig. 8D)

Plestiodon inexpectatus were found in clearings in pine woods and along the edges of ephemeral wetlands in the southern portion of the property. Multiple individuals were found parasitized by *Ixodes sp.* ticks. The species was encountered from March through May.
Specimens: NCSM 108479.

Eastern fence lizard (*Sceloporus undulatus* [Bosc & Daudin, 1801]; Fig. 8E)

Sceloporus undulatus were found in openings in the pine woods in the northern portion of the property in May and August.
Specimens: NCSM 107841.

Little brown skink (*Scincella lateralis* [Say, 1822]; Fig. 8F)

Scincella lateralis was the most commonly encountered lizard species. It was found in upland pine woods, clearings, and the edges of wetlands throughout much of the property. This species was encountered from March through October and in December.
Specimens: NCSM 107840.

Turtles (Order Testudines)

North American snapping turtle (*Chelydra serpentina* [Linnaeus, 1758])

Dead *Chelydra serpentina* were found in a pool and a canal along logging roads in the southern portion of the property. A live individual was found in the beaver pond along Black Branch Swamp. The species was found in May, July, and October. Virginia's 2015 State Wildlife Action Plan identifies *C. serpentina* as a species of moderate conservation need (tier IVa; DWR, 2015), but it was not listed in Virginia's 2025 State Wildlife Action Plan (DWR, 2025b) . This species is widely distributed in Virginia (Mitchell & Reay, 1999) but has a long life cycle and low hatchling survival, which limits its ability to recover from disturbances (Congdon et al., 1994). Overharvesting for commercial trade represents one of the main threats to the species (Congdon et al., 1994; Colteaux & Johnson, 2017). Recent regulation in Virginia has significantly limited the legal harvest of North American Snapping Turtles to preserve the species (Proctor, 2019). Other threats include mortality on roadways (Piczak et al., 2019) and environmental pollutants (Bishop et al., 1991, 1998).
Specimens: NCSM 107854.

Eastern painted turtle (*Chrysemys picta picta* [Schneider, 1783]; Fig. 9A)

Chrysemys picta picta were found in the eastern borrow pit and in an unnamed creek in the southern portion of the property. The species was found in July and August.

Spotted turtle (*Clemmys guttata* [Schneider, 1792]; Fig. 9B)

Clemmys guttata were primarily found throughout Black Branch Swamp and other permanent swamps along the property. One individual was found in an ephemeral pool in the southern pine woods. The species was found from January to May, with the earliest record on 2 January. Virginia's 2025 State Wildlife Action Plan identifies *C. guttata* as a species of high conservation need (tier IIIa; DWR, 2025b). It is listed as endangered by the International Union for Conservation of Nature (IUCN; van Dijk, 2011a). Habitat loss and fragmentation are the primary concerns for this species (Mitchell & Klemens, 2000). Spotted turtles rely both on a variety of shallow wetlands and relatively large areas of upland forest (Graham, 1995; Milam & Melvin, 2001; Litzgus & Brooks, 2001; Stevenson et al., 2015). The species frequently migrates between wetlands (Graham, 1995; Haxton & Berrill, 2001; Oxenrider et al., 2018) and thus relies on connectivity of those habitats. Unmanaged succession may damage the quality of spotted turtle habitats (Graham, 1995; Burke et al., 2000). Other potential threats include agricultural disturbances, pollution, and overcollection as pets (Burke et al., 2000; Mitchell and Klemens, 2000), though the species is now illegal to take, sell, or possess in Virginia (Proctor, 2021).

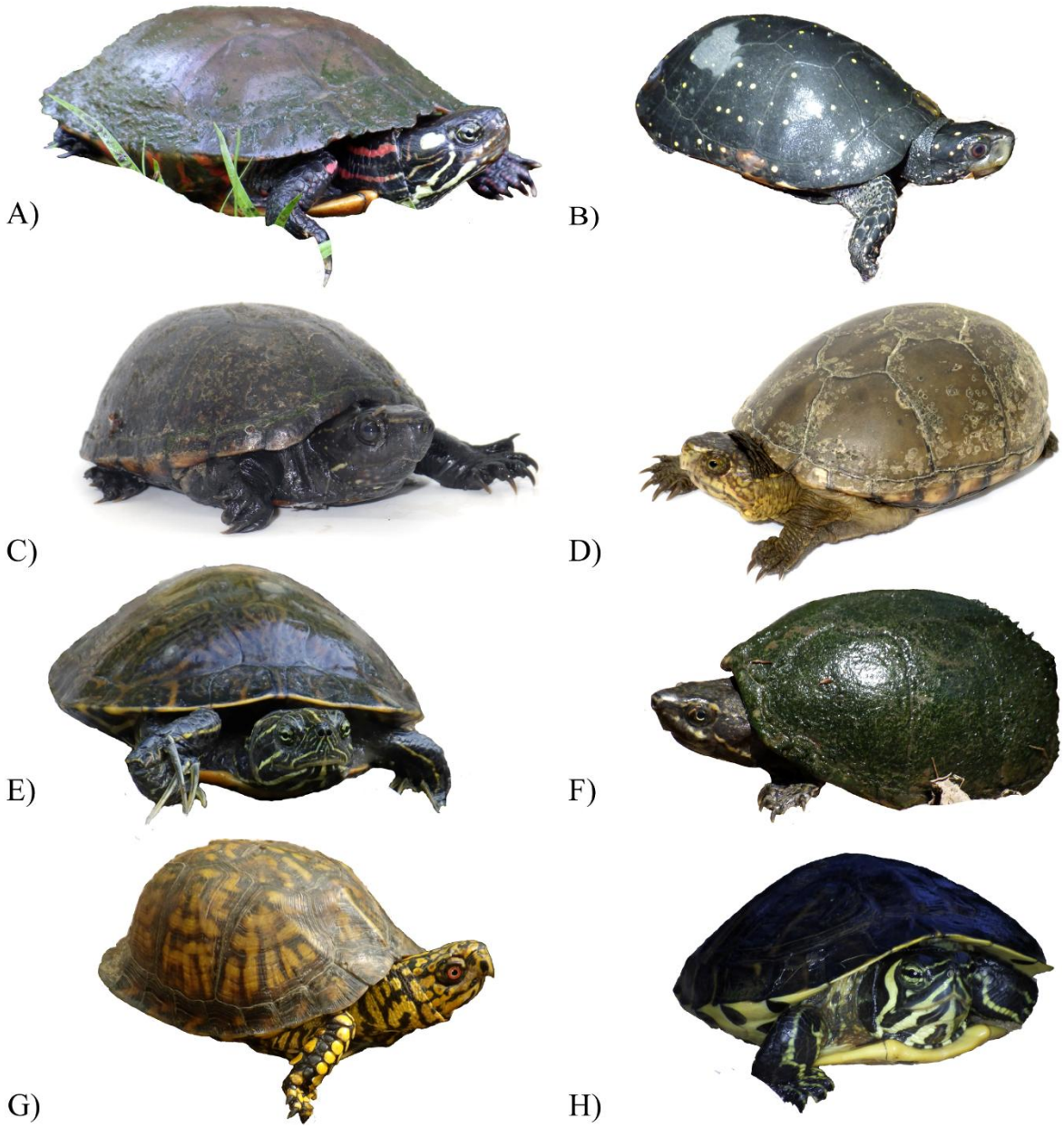

Figure 9. Turtles at Arch of the Nottoway Wildlife Management Area in Sussex, VA. A: *Chrysemys picta picta* (eastern painted turtle); B: *Clemmys guttata* (spotted turtle); C: *Kinosternon baurii* (striped mud turtle); D: *Kinosternon subrubrum subrubrum* (southeastern mud turtle); E: *Pseudemys concinna concinna* (eastern river cooter); F: *Sternotherus odoratus* (eastern musk turtle); G: *Terrapene carolina carolina* (woodland box turtle); H: *Trachemys scripta scripta* (yellow-bellied slider). Images are not to scale.

Striped mud turtle (*Kinosternon baurii* [Garman, 1891]; Fig. 9C)

Two *Kinosternon baurii* were found during surveys. One individual was found in an ephemeral swamp in the northern section of the property, and another was found in the ravine

through which Black Branch Swamp flows just before its confluence with the Nottoway River. Both individuals were found in May.
Specimens: NCSM 108467.

Southeastern mud turtle (*Kinosternon subrubrum subrubrum* [Bonnaterre, 1789]; Fig. 9D)

Kinosternon subrubrum subrubrum were significantly more common than *K. baurii*, with 34 individuals recorded. The species was found in virtually every wetland on the property except the Nottoway River. It was particularly abundant in ephemeral wetlands including ephemeral swamps, the western borrow pit, and pools on or along the roads. It was frequently the only turtle species encountered in these habitats. *Kinosternon subrubrum* was found from February through August, with the first record on 23 February. Multiple individuals were found parasitized by *Placobdella sp.* leeches.
Specimens: NCSM 108485.

Eastern river cooter (*Pseudemys concinna concinna* [Le Conte, 1830]; Fig. 9E)

Pseudemys concinna concinna were found in a rocky portion of the Nottoway River, where they were observed grazing on algae on the pebble bottom of the river. The species was recorded in September and October. These turtles were identified as *Pseudemys concinna concinna* by the presence of dark markings on the plastron and a c-shaped marking 2nd costal scute of the carapace, both of which the related *Pseudemys floridana* (Le Conte, 1830) lack (Powell et al., 2019). *Pseudemys concinna concinna* is not listed as occurring in Sussex County in either Virginia database (VHS, 2025, DWR, 2025a), herp atlases (Mitchell & Reay, 1999; Tobey, 1985), or on VertNet (http://vertnet.org/), but the shell of a deceased individual was found by Perry (2018) and Mitchell (1994) plotted an unvouchered record along the Nottoway River just east of the Fall Line but did not provide further details on this record. Thus, this record confirms the presence of *P. c. concinna* in Sussex County. *Pseudemys concinna concinna* is documented in the counties directly west of Sussex. Mitchell (1994) placed populations east of the Fall Line in southeastern Virginia to be *P. floridana*. The Nottoway River in Sussex County appears to be one of the only places in Virginia where *P. c. concinna* can be found east of the Fall Line.

Eastern musk turtle (*Sternotherus odoratus* [Latreille, 1802], Fig. 9F)

Sternotherus odoratus were found in the eastern borrow pit and an unnamed creek in the southern portion of the property. The species was found active from March through August, but one individual was found brumating in the muddy bottom of a canal in December.

Woodland box turtle (*Terrapene carolina carolina* [Linnaeus, 1758]; Fig. 9G)

Terrapene carolina carolina were found in upland woods and the edges of ephemeral swamps in the southern portion of the property. The species was found in May, July, and October. *Terrapene carolina carolina* is identified by Virginia's 2025 State Wildlife Action Plan as a species of high conservation need (tier IIIa; DWR, 2025b) and is listed as vulnerable by the IUCN (van Dijk, 2011b). The species is widely distributed in Virginia (Mitchell & Reay, 1999), but there is evidence of long-term declines across its range (Williams & Parker, 1987; Hall et al., 1999;

Kemp et al., 2022). The primary threats to the species are habitat destruction and fragmentation (Dodd, 2002). *Terrapene carolina carolina* use different habitats depending on age, season, and time of day, and thus rely on a diversity of habitats including mesic woods, open areas, and wetlands (Dodd, 2002). The turtles are susceptible to mortality on roads, environmental pollution, and collection as pets (Dodd, 2002), though, like other SGCN species, the collection, sale, and keeping of the species is now illegal in Virginia (Proctor, 2021). *Terrapene carolina carolina* is also susceptible to morbidity and mortality from a wide variety of pathogens which may contribute to upper respiratory tract disease (Agha et al., 2017; Archer et al., 2017; Feldman et al., 2006; Franzen-Klein et al., 2020; Kane et al*.,* 2017). Like other turtle species, box turtles are long-lived and slow to recover from these losses (Hall et al., 1999).

Yellow-bellied slider (*Trachemys scripta scripta* [Thunberg in Schoepff, 1792]; Fig. 9H)

Trachemys scripta scripta were found in permanent wetlands throughout much of the property, including the eastern borrow pit, an unnamed creek in the south, and the Nottoway River. The species was found from May through September. A female was found laying eggs on 7 June 2022. Virginia's 2025 State Wildlife Action Plan identified *T. s. scripta* as a species of moderate conservation need (tier IVb; DWR, 2025b). Intergradation with introduced populations of red-eared slider (*Trachemys scripta elegans* [Wied, 1838]) is the primary threat to *T. s. scripta* (Mitchell, 1994; Parham et al., 2020). It is notable that *T. s. elegans* or clear intergrades were never found during my surveys and the subspecies has not been documented in Sussex County (VHS, 2025; DWR, 2024b). Thus, the clearest management action for *T. s. scripta* is to prevent the spread of *T. s. elegans* to the property or nearby portions of the Nottoway River.

DISCUSSION

Arch of the Nottoway Wildlife Management Area has unusually high herpetofaunal species richness. A total of 51 amphibian and reptile species were found on the property, representing approximately one-third of Virginia's herpetofaunal diversity. This study represents the most complete published herpetological survey in Sussex County to date. Additionally, I documented three new county records during this survey: *Nerodia taxispilota, Stereochilus marginatus,* and *Virginia valeriae valeriae,* and confirmed the county record for *Pseudemys concinna concinna.*

Of the species documented on the property, six are listed by the DWR as species of greatest conservation need (SGCN), and three are on the DCR-DNH list of rare and watchlist species. For most of the SGCN on the property, protection of both wetland and upland habitats is the largest management need. This may include restoration of wetlands that have been drained by ditches (as appears to be the case along portions of Black Branch Swamp and other streams on the property) and maintenance of vegetated buffers around wetlands. Maintaining the connectedness of both wetland and upland habitats is also of conservation concern. Management to maintain a diversity of open and forested habitats may also be important to species such as *Clemmys guttata* and *Terrapene carolina carolina*. Additionally, little information is available on the conservation status and population trends of the SGCN, particularly salamanders. Future monitoring of species should be used to better understand conservation priorities.

Two major wetland habitats are of particular importance to the SGCN identified on the property. Black Branch Swamp was the only habitat in which *Stereochilus marginatus* was found, and is apparently a breeding habitat for the species. It is also an important habitat for the *Clemmys*

guttata and *Chelydra serpentina*. Despite being manmade, the borrow pits are also particularly important amphibian and reptile habitats. The western borrow pit was one of the most productive frog breeding sites on the property, with at least 13 species recorded calling. It was also the only site where the state watchlist and state rare salamanders *Siren lacertina* and *Siren intermedia* were found. The eastern borrow pit was similarly productive, with 12 frog species recorded calling. It was also a valuable turtle habitat, with four species documented, including the SGCN *Trachemys scripta scripta*. Both Black Branch Swamp and the borrow pits may deserve special protections against alteration, and adjacent upland habitats should remain intact to allow for the persistence of species such as *Clemmys guttata*.

Despite over 550 person-hours of surveying across 65 days, the survey likely undercounts the true number of species on the property. Rarefaction analysis indicates that higher species richness would be found with further sampling effort. Additionally, many reptile species such as kingsnakes (*Lampropeltis sp.*), eastern hog-nosed snake (*Heterodon platirhinos* Latreille, 1801), mud and rainbow snake (*Farancia sp*.), and rough greensnake (*Opheodrys aestivus* [Linnaeus, 1766]), garter and ribbon snake (*Thamnophis sp.*), coastal plains cooter (*Pseudemys concinna*) and northern red-bellied cooter (*Pseudemys rubriventris* [LeConte, 1830]) are documented in the county but were notably absent. Likewise, the dwarf waterdog (*Necturus punctatus* [Gibbes, 1850]) is documented in nearby portions of the Nottoway River Drainage (Roble et al., 1999) but I did not find the species despite targeted sampling. Other potential amphibians which I did not encounter include oak toad (*Anaxyrus quercicus* [Holbrook, 1840]), barking treefrog (*Dryophytes gratiosus* [LeConte, 1856]), southern chorus frog (*Pseudacris nigrita* [LeConte, 1825]), and little grass frog (*Pseudacris ocularis* [Bosc and Daudin, 1801]). I also did not detect any *Desmognathus* salamanders, which are documented in Sussex County but may require taxonomic revision. Two species are currently recognized in the county (*Desmognathus fuscus* [Green, 1818] and *Desmognathus auriculatus* [Holbrook, 1838]), but based on the sampling of Pyron & Beamer (2023, 2022) the only species in Sussex County is likely *D. lycos* Pyron & Beamer, 2023.

Including the species newly documented in this survey, a total of 80 species and distinct subspecies of amphibians and reptiles have now been documented in Sussex County, making it the most species-rich county in Virginia. Future monitoring is required to accurately assess the conservation status of these species, but their individual needs should be incorporated into a management plan of the property. Additional surveys efforts are also likely to uncover even more species on this very species-rich property. Coupling additional sampling with genetic analyses will provide new insights into the herpetofaunal diversity of the area. Sampling using environmental DNA (Kyle et al., 2022) or invertebrate ingested DNA (Fahmy et al., 2023) may be particularly useful in detecting the remaining secretive species on the property.

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