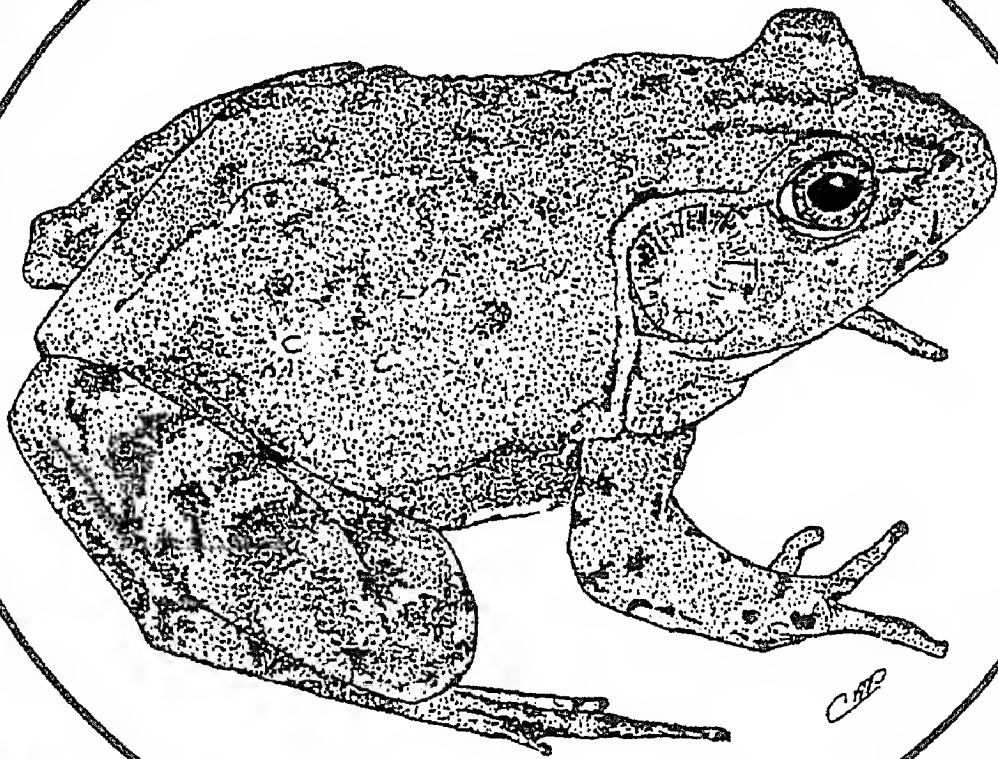


CATESBEIANA



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Field Notes

The field notes section of *Catesbeiana* provides a means for publishing natural history information on Virginia's amphibians and reptiles that does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior, and other topics are welcomed. Field Notes will usually concern a single species. The format of the reports is: scientific name (followed by common name in parentheses), state abbreviation (VA), county and location, date(s) of observation, observer(s), data, and observations. The name(s) and address(es) of the author(s) should appear one line below the report. Consult the editor if your information does not readily fit this format. **All field notes must include a brief statement explaining the significance of the record** (e.g., new county record) **or observation** (e.g., unusual or rarely observed behavior, extremely early or late seasonal record, abnormal coloration, etc.). Submissions that fail to include this information are subject to rejection. Relevant literature should be cited in the body of the text (see Field Notes in this issue for proper format). All submissions will be reviewed by the editor (and one other person if deemed necessary) and revised as needed pending consultation with the author(s).

If the field note contains information on a **new county (or state) record, verification is required in the form of a voucher specimen** deposited in a permanent museum (e.g., Virginia Museum of Natural History) or a **photograph** (print, slide, or digital image) **or recording** (cassette tape or digital recording of anuran calls) deposited in the archives of the Virginia Herpetological Society. Photographs and recordings should be sent to the editor for verification and archiving purposes; the identity of voucher specimens **must be confirmed** by a museum curator or other qualified person. Include the specimen number if it has been catalogued. Prospective authors of distribution reports should consult Mitchell and Reay (1999. *Atlas of Amphibians and Reptiles in Virginia*), Mitchell (1994. *The Reptiles of Virginia*), and Tobey (1985. *Virginia's Amphibians and Reptiles: A Distributional Survey*) [**both atlases are available on-line on the VHS website**] as well as other recent literature to determine if they may have a new county record. New distribution records from large cities that formerly constituted counties (Chesapeake, Hampton, Newport News, Suffolk, and Virginia Beach) are acceptable, but records from smaller cities located within the boundaries of an adjoining county will only be published if the species has not been recorded from that county. Species identification for observational records (e.g., behavior) should be verified by a second person whenever possible.

PHOTOGRAPHS

High contrast photographs (prints, slides, or digital images) of amphibians and reptiles will be considered for publication if they are of good quality and are relevant to an accompanying article or field note. Prints should be on glossy paper and no larger than 5 x 7 inches. Published photographs will be deposited in the archives of the Virginia Herpetological Society.

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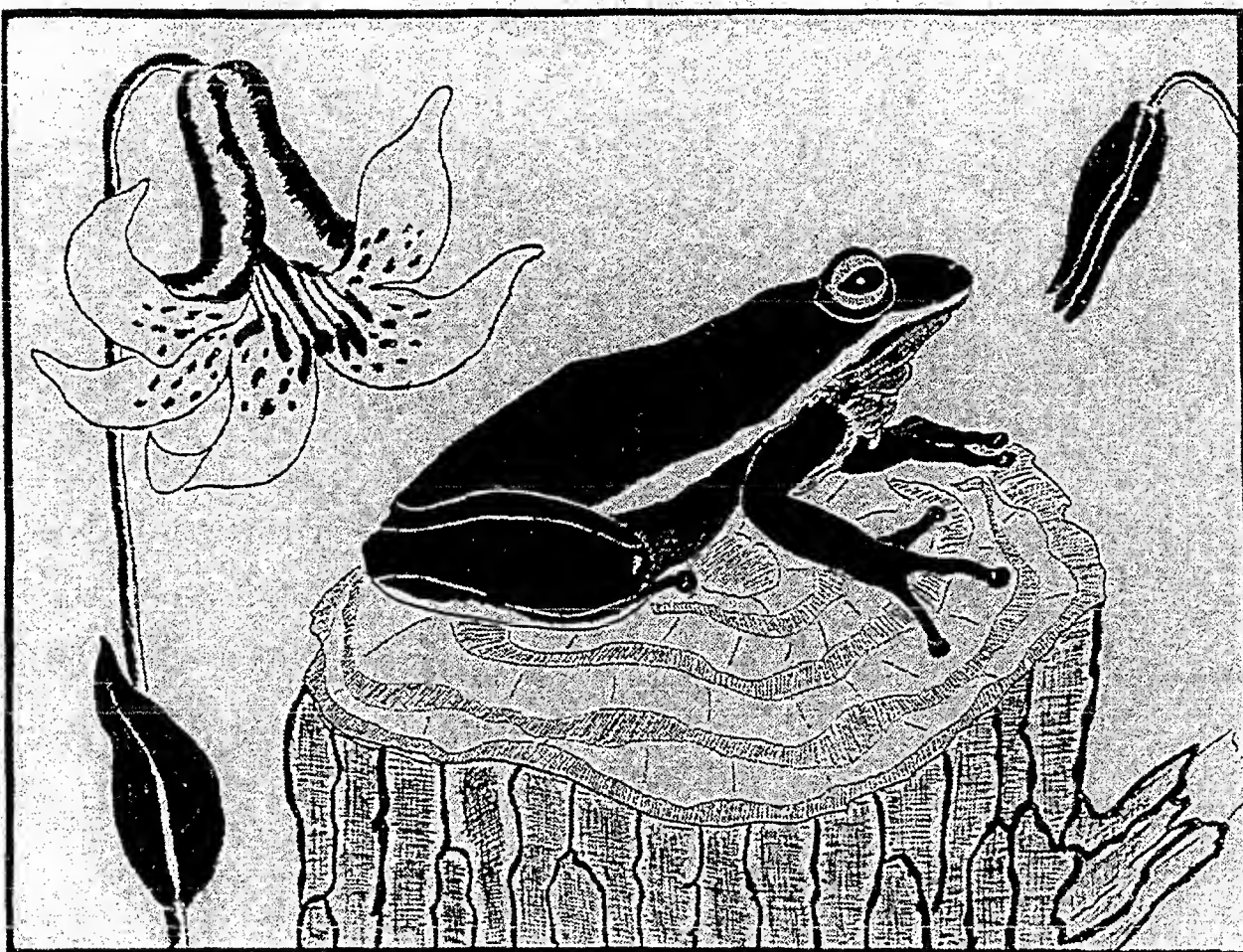
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Green Treefrog (*Hyla cinerea*)

Pen-and-ink drawing by Roger Rageot (1931-2006);
originally published in 1963 on the cover of the
Philadelphia Herpetological Society Bulletin.

Opportunistic Anuran Surveys in Southeastern Virginia: Looking for Oak Toads, but Finding.....Spadefoots!

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Introduction

Roble et al. (2005) reviewed the occurrence of Oak Toads (*Bufo quercicus*) in Virginia, noting that there were only six vouchered records from the cities of Portsmouth, Chesapeake, and Suffolk, and the counties of Surry, Southampton, and Greensville. Its distribution seems to be limited to south of the James River, west of the Dismal Swamp, and east of the Fall Line. Pague (1991) described *B. quercicus* as extremely rare in Virginia, threatened by the loss of mature pine and pine-oak habitats as well as urbanization. It is quite common south of Virginia, but because of its rarity in Virginia it is considered a species of Special Concern.

One reason why *B. quercicus*, *Pseudacris ocularis* (Little Grass Frog), and *Scaphiopus holbrookii* (Eastern Spadefoot Toad) may appear rare is that all three breed primarily during heavy rains which typically accompany tropical storms. Anurans have their highest visibility when males are calling and individuals congregate at breeding pools. At other times of the year these animals are dispersed into secretive, often fossorial, habitats where they are seldom observed. People do not typically travel during violent storms with heavy rains and flooded roads. It is also possible that a species may be drawn out by one storm but not another. Thus, negative results during one storm survey do not mean that a species is absent from that area. While it has been observed that heavy rains are necessary to trigger breeding activity in the three target species mentioned above (Hansen, 1958; de Rageot et al., 1969), little is known regarding the conditions that are sufficient to stimulate such activity.

Roble et al. (2005) proposed to “follow in the footsteps” of Leslie Burger who had recorded *B. quercicus* in Sussex and Southampton counties in 1959-1960 (unpublished notes). Following Tropical Storm Bill which blew through Virginia on 1-2 July 2003 and deposited 3-8 cm of rain, they returned to the areas mentioned by Burger and were able to document *B. quercicus* from three sites in Sussex and 14 sites in Southampton County. This included the two areas from near where Burger had reported Oak Toads more than 40 years earlier. Roble et al. (2005) reported a total of 17 different anuran species observed on one evening

of road cruising, which they claim is the highest on record for Virginia. Despite such high breeding activity, some common species known to occur in these counties were not encountered during their surveys, including *Rana palustris* (Pickerel Frog) and *S. holbrookii*.

Roble et al. (2005) remarked that “The complete absence of *Scaphiopus holbrookii* during our surveys despite plentiful rainfall during that week was surprising.” Spadefoot toads are opportunistic breeders, emerging only during heavy rains. Several of the western species may breed explosively for one or two nights, then disappear again for years (PS, pers. obs.). We could find no reports other than Church et al. (2002) reporting on the length of time that choruses are active in Virginia. They report that the breeding chorus was active over several days.

When the annals of *Catesbeiana* are examined, there are only 4-5 reports of *S. holbrookii* breeding and all those are older records from 1927-1941 (Mitchell, 1990, 1991a). Hoffman (1985) reports that at Radford, Virginia, he heard only one chorus in 20 years residence although spadefoots were known to occur and were not infrequently discovered during excavations and other incidental activities. Thus, spadefoots may be present for a long time but not observed to engage in breeding activity. Roble et al. (2005) concluded their paper by encouraging others to carry out surveys for breeding anuran populations throughout southeastern Virginia, especially after warm heavy rains.

During the early summer of 2006, one of the authors (JG) contacted the other about the possibility of conducting a survey in southeastern Virginia immediately in the wake of Tropical Storm Alberto in an effort to document additional *B. quercicus* populations. We decided to head east from southern Greensville County and drive a loop through the northwestern half of Southampton County, listening for breeding anuran choruses along the entire route.

Survey Date and Location

We drove from central Virginia through a fairly constant rain produced by Tropical Storm Alberto on the morning of 14 June 2006 to just east of Emporia in Greensville County. Beginning at 1940 h we drove east on Route 730 into southwestern Southampton County and took a circular route, primarily on back roads, through the northern and eastern portion of the county. We proceeded northeast on Route 653 as far as US 35 at Sebrell. We circled Assamoosick Swamp going east on US 35, north on Rt. 606, west on Rt. 607, and south on US 35 back to Sebrell. We returned via a more northerly route: west on Rt. 609, south on Rt. 735, west on Rt. 612, and south on Rt. 659 to US 58 where we ended

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the survey. At the beginning of the survey the rain had ceased, leaving cloudy skies and an air temperature of 21° C. After a trip of 138.25 km we ended the survey at 0155 h on the morning of 15 June 2006. Weather reports indicated that >7 cm of rain fell on 14 June 2006 after a month-long drought, flooding many roads and fields. This provided excellent conditions for species requiring heavy rains to initiate breeding. We began by recording every individual calling, but as there were continuous choruses at many locations, the one merging into another, and individuals so closely spaced, that we recorded only choruses, not individuals, for the most common species such as *Hyla chrysoscelis* (Cope's Gray Treefrog), *Hyla squirella* (Squirrel Treefrog), and *Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad). We attempted to record all individuals of rarely encountered species and estimate the number at each site.

Results

We recorded a total of 11 different anuran species at 34 sites in Greenville County and 14 species at 59 sites in Southampton County (Tables 1 and 2). The total count for the night was 15 species at 93 sites. *Pseudacris feriarum* and *Rana catesbeiana* are known to occur in this region but neither species was heard or seen. *Rana clamitans* and *R. palustris* were not heard, but several were observed crossing roads. Only one snake, a DOR *Elaphe alleghaniensis*, was found in Southampton County. No salamanders or turtles were observed at any time during our survey. The following annotated checklist briefly summarizes our records for each anuran species. Detailed locality data are provided in the tables.

Annotated Checklist

1. Northern Cricket Frog (*Acris crepitans*)
[7 sites; 1 Greenville Co. (G), 6 Southampton Co. (S)]

Since neither of us was familiar with *A. gryllus* calls, we recorded all *Acris* as *A. crepitans*, the more common species in this area. It is possible that the species present at some localities, particularly in Southampton County, could have been misidentified. Most of the populations were heard where the road crossed a stream.

2. American Toad (*Bufo americanus*) [12 sites; all S]

We heard a small chorus at eight of the localities, we observed one or more toads on the road at the other four sites. We typically heard *B. americanus* calling from flooded agricultural fields.

3. Fowler's Toad (*Bufo fowleri*) [11 sites; 1G, 10S]

A small chorus was heard at six of the localities. One or more toads were observed on the road at the other five sites. Where a chorus was heard, it was typically in a flooded agricultural field.

4. Oak Toad (*Bufo quercicus*) [7 sites, all S]

Oak toads were heard at seven sites, all within northern Southampton County. Five of these were along Route 35, where Roble et al. (2005) had reported numerous observations north of Sebrell. The other two sites were just west of Sebrell. The first was a chorus of eight males calling from a flooded agricultural field along Rt. 653 from 1.25-1.75 km south of Route 719. It was an extensive flooded area, or perhaps a series of pools in the same field with males spaced along 0.5 km. The second new site was on Route 609, 1.9 km north of Route 653. Two males were calling from thick brush along the floodplain of Hornet Swamp Creek at the Rt. 609 bridge. This last site is separated from all others by the Nottoway River.

5. Eastern Narrow-mouthed Toad (*Gastrophryne carolinensis*)
[25 sites; 15G, 10S]

Narrow-mouthed toads were the third most commonly heard anuran in Greensville County. They were much less common in Southampton County, and not heard or observed north of Route 58.

6. Cope's Gray Treefrog (*Hyla chrysoscelis*) [47 sites; 19G, 28S]

Cope's Gray Treefrog was the most prevalent species heard during our survey. We heard large choruses throughout both counties and frequently observed amplexus when we were able to access the breeding site. We did not hear any *H. versicolor* calls.

7. Green Treefrog (*Hyla cinerea*) [14 sites; 3G, 11S]

Green Treefrog choruses ranged from small to large, often at locations far from the road. Two were found alive on the road (AOR).

8. Pine Woods Treefrog (*Hyla femoralis*) [24 sites; 5G, 19S]

We had infrequently encountered *H. femoralis* during previous visits to Greensville County. However, during the Alberto Survey they were fairly common in both counties, perhaps being stimulated to call by the heavy rains

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following a prolonged dry spell. Choruses ranged from small to large in both counties, and exceeded 100 individuals at the one truly huge site (Route 653 0.8 km N 724) in Southampton County.

9. Squirrel Treefrog (*Hyla squirella*) [40 sites; 21G, 19S]

Squirrel Treefrogs were the most commonly encountered species in Greensville County, and the second most common species in Southampton County. Numerous choruses (both large and small) were heard throughout the survey and several amplexed pairs were observed.

10. Spring Peeper (*Pseudacris crucifer*) [3 sites; 1G, 2S]

Although it was past the normal breeding time for spring peepers, there was one site in each county with a solitary male calling. There was also a lively chorus of at least six males calling from a dense rose thicket just north of Capron in Southampton County. We did not observe any metamorphs or adults on the roads, possibly due to the drought in this area preceding the survey.

11. Little Grass Frog (*Pseudacris ocularis*) [6 sites; all S]

The Little Grass Frog was found only at sites along Route 35 north of Sebrell where Roble et al. (2005) had previously documented the species in Southampton County. Most of the sites were roadside grassy ditches.

12. Green Frog (*Rana clamitans*) [2 sites; both G]

Surprisingly, we found only two Green Frogs, both crossing roads in southeastern Greensville County.

13. Pickerel Frog (*Rana palustris*) [1 site]

Two Pickerel Frogs were found on the road at a site in the southwestern corner of Southampton County.

14. Southern Leopard Frog (*Rana sphenocephala*) [6 sites; 1G, 5S]

Several males were calling at a site in the southeast corner of Greensville County. Four were found on the road at different sites in southwestern Southampton County. One was calling from a site in northern Southampton County just southwest of Sebrell.

15. Eastern Spadefoot Toad (*Scaphiopus holbrookii*) [16 sites; 1G, 15S]

One male Spadefoot Toad was heard at a site in southeastern Greenville County just before dark but it was not calling about 0200 h when we returned to this site. We also heard Spadefoots at 15 sites scattered throughout our route in Southampton County (Table 1). Most of the choruses were in flooded agricultural fields, but at least one was in a roadside swamp (Rt. 653 1.8 km north of Rt. 661). Amplexed pairs were observed at four sites. Many choruses were quite large, with the largest probably exceeding 100 males (Rt. 653 just north of Rt. 724). Since Spadefoot Toads, like Oak Toads, may need heavy rains to initiate breeding activity, their breeding activity is rarely seen. The first author's experience with western species indicates that Spadefoot toads may only call and breed for one night, further limiting the possible exposure to this unusual eastern species.

Discussion

Roble et al. (2005) discussed the surprisingly high diversity of anurans observed on their two nights of surveys. The first of these, in which they observed 17 of the 26 anurans recorded for Virginia, was proposed to "likely rank[s] as one of the most successful anuran surveys in the history of Virginia herpetology." Our survey runs a close second, recording 15 species. We recorded *R. palustris* and *S. holbrookii* where they did not, but did not record *R. catesbeiana* or *P. feriarum* metamorphs, possibly being early in their breeding season, and *A. gryllus* and *B. terrestris* possibly because of not being able to distinguish their calls. There is little doubt that southeastern Virginia in general, and Greenville and Southampton Counties in particular, contain some of the most diverse anuran communities in the Commonwealth. Our survey corroborates the Roble et al. (2005) report which verified Leslie Burger's lost vouchers for *B. quercicus* near Sebrell in Southampton County.

Unlike Roble et al. (2005), we did not find a large number of species at the sites visited in mid-June. During their early July surveys, they reported more than seven species at eight of their 65 sites, with a high of ten species at one site in Southampton County. We found six species at two of our 93 sites, five species at five sites, four species at nine sites, three at 25 sites, two at 21 sites, and only a single species at 31 sites.

There was a distinct difference in the ratio of *Bufo americanus* to *Bufo fowleri* choruses reported between our survey in June and that of Roble et al. (2005) in July. We observed *B. americanus* at 12 sites (13%) and *B. fowleri* at 11 (12%) for an equal frequency overall. Roble et al. (2005) observed *B. americanus* at six sites (9%) and *B. fowleri* at 28 (43%). The breeding season for *B. americanus* is

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earlier than that for *B. fowleri* (Conant and Collins, 1991) which may explain this discrepancy.

We discovered one remarkable site just southwest of Capron on Rt. 653, 0.6 km north of Rt. 724. It consisted of a large flooded field in a deserted area separated from the road by only a grassy strip of land with a few large trees. The other side of the road was forested. The chorus was so deafening that neither of us could distinguish which species were calling from the roadside. We had to wade out into the flooded field to determine the species composition. We had never encountered so many calling males at one site. The chorus consisted of at least 100 males each of Narrow-mouthed Toads, Pine Woods Treefrogs, Squirrel Treefrogs, and Spadefoot Toads, with almost as many Cope's Gray Treefrogs. More were coming from the woods and hopping across the road to reach the water. Amplexed pairs of all species were present.

Our survey shows that *S. holbrookii* is not only present but prevalent in at least Southampton County despite its absence from the Roble et al. (2005) survey. We found, on the first night of the heavy rains during a tropical storm, that Spadefoot toads were breeding in large numbers (large choruses at nine localities and smaller choruses at six sites). We observed amplexed pairs at four of the sites. It is possible that Roble et al. (2005) missed the Spadefoot breeding activity if this activity was limited to only the first night of heavy rain. Their surveys occurred on the second and third nights after the initial rains. Breeding activity may have ceased by that time. One of the sites (Rt. 653 0.3 km N of Rt. 719) was visited by both Roble et al. (2005) and us. Their description of the site with flooding occurring in the field and onto the road matches what we observed. We counted 14 Spadefoot toads, with one amplexed pair, and collected a DOR specimen (LUNMH# 642) as a voucher. This discrepancy indicates the difficulty that may exist in documenting breeding choruses of Spadefoot toads. It may not only be necessary to survey after heavy rains associated with tropical storms, but specifically on the first night of heavy rains, or during heavy rains following prolonged drought conditions. The absence of Spadefoot toad choruses during some heavy rain events does not necessarily indicate the lack of breeding populations. It is also possible, but unlikely, that the two week difference in the season (mid-June for the present survey and early July for Roble et al., 2005) could have caused the difference in results because Spadefoot toads are known to have an extended breeding season and breeding choruses are reported for most months of the year (Hansen, 1958). It may prove more profitable to document the presence of Spadefoot tadpoles than to find active breeding choruses.

There appear to be surprisingly few records of Spadefoot toads breeding in Virginia. Searching through the Taxonomic Index for *Catesbeiana* (Sattler, unpublished) it is possible to find 10 citations where *S. holbrookii* is expected but

absent from a herpetological survey. There are an additional nine citations where one or more individuals were found incidentally, but not in a breeding chorus. There are additional sources where Spadefoot toads are reported from Virginia (Merkle, 1977) or are not found in localities where they were expected (Hoffman and Mitchell, 1996). Literature citations for breeding choruses in Virginia are reported only from 1927 (Mitchell, 1990; Trautmann, 1931), 1935 (Hansen, 1958; Mitchell, 1990), 1937 (Mitchell, 1990), 1940 (Richmond, 1947), 1941 (Mitchell, 1991a), 1944 (Richmond, 1947), 1957 (Burger, 1957), 1969 (de Rageot et al. 1969) and 2001 (Church et al., 2002).

The North American Amphibian Monitoring Program has records of a Spadefoot toad chorus in 2002 (July 7 in Botetourt Co.), two in 2003 (both on July 15 from King William Co.), and 2006 (June 28 in Fauquier Co.) from calling frog survey records (J.D. Kleopfer, pers. comm.). There are additional reports from unpublished data by N. Richmond cited in Hansen (1958) from 1938-1948. Our survey appears to be the fifth report since 1957 to document breeding *Scaphiopus* populations in Virginia. Our report is the third to record multiple choruses from the same night. We found 15 breeding choruses which is more breeding sites than all other sources combined to date. We would encourage others to become involved in “storm chasing” for a chance to observe these unusual toads.

Acknowledgements

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Table 1. Tropical Storm Alberto Anuran Survey Results from Greenville County, June 14-15, 2006.												
Locality/Species	Ac	Bf	Gc	Hch	Hci	Hf	Hs	Pc	Rc	Rs	Sh	
730 1.75 km NW 629			S	S			S					
730 1.6 km NW 629			S				S					
730 0.8 km NW 629			S				S					
730 0.2 km NW 629 at bridge over stream				S								
730 at 629			S	S			S					
730 0.5 km SE 629 in flooded field			L	S			S					
730 0.6 km SE 629				S								
730 1.3 km SE 629 in clearcut							S					
730 2.1 km SE 629				S								
730 2.25 km SE 629 in flooded field				S			S					
730 2.9 km SE 629 in clearcut			S			7	S					
730 3.5 km SE 629, 1.5 km NW 660 in flooded field			S				S				1	
730 0.4 km NW 660				S			S					
730 0.25 km NW 660 in roadside ditch			S				S					
730 0.75 km SE 660 in woods and flooded field			L	S			L					
730 1.4 km SE 660 in flooded field			S	S			S					
730 3.6 km SE 660 in woods				S		5	S					
730 3.8 km SE 660 in woods						L						
730 3.9 km SE 660 in woods				S	S		S					
730 4.55 km SE 660 in flooded field			S	S			S					
730 4.9 km SE 660, 0.2 km NW 622 in flooded field			L									
730 0.8 km SE 622 in flooded field				S			S					
730 0.95 km SE 622 in woods				L		L		1				
730 1.3 km SE 622, 0.15 km NW 646 in clear cut				S		L	S					
730 1.1 km SE 646 in woods				L								
730 1.3 km SE 646							L					
730 2.1 km SE 646									1 R			
730 2.4 km SE 646 in flooded field			L									
730 2.9 km SE 646				L A					1 R			
730 3.1 km SE 646 in large swamp	S			S	L							
730 3.35 km SE 646			L		L						3	
730 3.5 km SE 646 in flooded field			S				L					
730 3.75 km SE 646, 0.25 km NW Southampton Co. line							L					
730 3.9 km SE 646, 0.1 km NW Southampton Co. line		1										
L = large chorus (>20 males calling)												
S = small chorus (<20 males calling)												
Numbers = individuals observed/counted or estimated from calls												
A = amplexus observed												
R = individuals observed on road												
Ac = <i>Acris</i> sp.												
Ba = <i>Bufo americanus</i>												
Bf = <i>Bufo fowleri</i>												
Bq = <i>Bufo quercicus</i>												
Gc = <i>Gastrophryne carolinensis</i>												
Hch = <i>Hyla chrysoscelis</i>												
Hci = <i>Hyla cinerea</i>												
Hf = <i>Hyla femoralis</i>												
Hs = <i>Hyla squirella</i>												
Pc = <i>Pseudacris crucifer</i>												
Po = <i>Pseudacris ocularis</i>												
Rc = <i>Rana clamitans</i>												
Rp = <i>Rana palustris</i>												
Rs = <i>Rana sphenoccephala</i>												
Sh = <i>Scaphiopus holbrookii</i>												

Table 2. Tropical Storm Alberto Anuran Survey Results from Southampton County, June 14-15, 2006 (see Table 1 for abbreviation codes).														
Locality/Species	A c	B a	B f	B q	G c	H ch	H ci	H f	H s	P c	P o	R p	R s	S h
730 3.7 km S 653, 0.3 km N Greensville Co. line			1				L					2 R		
730 3.3 km S 653 0.65 km N Greensville Co. line					S	L								
730 3.1 km S 653 1.0 km N Greensville Co. line		1 R				L								
730 2.8 km S 653, 1.3 km N Greensville Co. line in flooded field					L	L							1 R	
730 2.55 km S 653, 1.5 km N Greensville Co. line									L					
730 2.0 km S 653, 1.9 km N Greensville Co. line						LA							1 R	
730 1.8 km S 653, 2.0 km N Greensville Co. line	L					L	1 R							
730 1.5 km S 653, 2.3 km N Greensville Co. line in flooded field	S	3 R						S	L				1 R	
730 1.0 km S 653, 3.1 km N Greensville Co. line			2 R			L			L				1 R	
653 0.25 km N 730		1 R	1 R		S	L	S		S					
653 0.65 km N 730		S	S											
653 1.0 km N 730 flooded roadside						S								
653 at 662		S			S									
653 0.5 km N 662 flooded field		S				S			S					
653 0.75 km N 662									S					
653 1.5 km N 662						S								
653 5.1 km N 662 flooded field					S	S			S					16 A
653 0.75 km N 661		S	S			S			S					
653 1.0 km N 661 in clearcut								L						
653 1.3 km N 661		S					S	L	L					1
653 1.8 km N 661 in swamp					SA			S						22 A
653 1.9 km N 661								L	S					
653 2.5 km N 661 at 663 in roadside ditch		S			SA			1	SA					3
653 0.4 km N 663														2
653 1.0 km N 663									S					L
653 1.3 km N 663			S			S	L		L					
653 1.0 km N 659 in flooded field						L								
653 1.5 km N 659			S			S	L		S					
653 2.5 km N 659 in cattail swamp					S	SA		S	S					L
653 at 724														1

Table 2. Tropical Storm Alberto Anuran Survey Results from Southampton County, June 14-15, 2006 (see Table 1 for abbreviation codes).														
Locality/Species	A c	B a	B f	B q	G c	H ch	H ci	H f	H s	P c	P o	R p	R s	S h
653 0.3 km N 724 in flooded field						S		L						S
653 0.6 km N 724 in large flooded field with woods opposite road					100+	L		100+	100+					~100
653 1.3 km N 724 in flooded field					S			S	S					
653 0.3 km N 655 in flooded field						L			L					L
653 0.6 km N 652 in flooded field		2	2				L	S						
653 1.5 km N 652 in flooded field						L			L					L
653 1.5 km N 651 in thick brush										6				
653 0.6 km N 609 at bridge	L	S				L	1							
653 from 609 to 0.6 km N of 609	S		S	8			S							
653 0.3 km N 719 in flooded field right beside and onto road														14 A
VA 35 just N 719	S	S				S	S	S			L			
VA 35 1.5 km S 719														S
606 at bridge 4.5 km N 634						L	L							
607 2.0 km W 606						2		L						
VA 35 at 607 in ditch and old field				1		S								
VA 35 0.3 km S 607 flooded field				1										
VA 35 0.5 km S 607								S						
VA 35 0.8 km S 607											S			
VA 35 2.8 km S 607 in roadside ditch											S			
VA 35 3.1 km S 607				S							S			
VA 35 3.3 km S 607				S							S			
VA 35 3.6 km S 607, 1.5 km N 653	S			3				S			S			
653 2.0 km S VA 35, 3.2 km N 609											S		1	
609 1.9 km N 653 in brush-filled floodplain				2										
609 4.2 km N 653								S						
609 6.7 km N 653						L								
735 0.95 km S 609 in flooded field								L						L
612 4.0 km W VA 308, 3.5 km N 659						L		L		1				
612 0.7 km S 697, 2.4 km N 659			S			S		L						

Herpetological Records from the First Annual Herp Blitz at Fairy Stone State Park and Fairystone Farms Wildlife Management Area

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Introduction

One of the primary missions of the VHS is to increase the knowledge base on reptile and amphibian populations in Virginia. To accelerate this mission, the society's officers conceived a plan to increase the number of herpetological surveys conducted each year. The first annual Herp Blitz resulted from these discussions, and if kept viable, could double the number of surveys that the VHS conducts annually. The Herp Blitz could be a snapshot survey of an area at a single time or could involve one particular area surveyed several times during different seasons, thus allowing a better cataloging of species. The vision of the current officers is to substantially grow the information available for herps in Virginia. It is our hope that people will catch onto this vision by conducting surveys in their own area after participating in the society's surveys and publish their observations and distributional records in *Catesbeiana* or other herpetological journals. It is imperative at this time in our history that the VHS spearhead an effort to document the relative abundance and distribution of reptiles and amphibians in as many diverse locations around the state as possible. As more human development occurs, we are losing the historical distributions and abundance levels of this group of animals. Documentation now will be invaluable to future herpetologists and ecologists trying to understand distribution, disease, introductions, and declines in populations.

In planning for the location of the first annual Herp Blitz, attention focused on areas that had been considered but not previously surveyed. Fairy Stone State Park was selected as the site of the first Herp Blitz. It is the largest of Virginia's original six state parks and comprises 1,836 ha with a 68 ha lake. The park has land in Patrick, Franklin, and Henry counties. Founded in the 1930s, it is probably best known for the staurolite crystals or "fairy stones" that can be found throughout the park. There are many features that make this a very well visited park. There are abundant fishing opportunities, camping facilities, numerous hiking trails, and a swimming lake. Most of the park facilities, including Fairy Stone Lake, were constructed by the Civilian Conservation Corps.

Fairystone Farms Wildlife Management Area, the other Herp Blitz survey site, comprises 2,339 ha of land in Patrick and Henry counties. All of the VHS survey sites were in Patrick County. The WMA property has many points of interest, including old mines, many numerous hiking trails, and a marsh impoundment for migratory waterfowl. Both the state park and wildlife management area are in the foothills of the Blue Ridge Mountains. The highest elevation is 480 m above sea level. Oak, hickory, and pine dominate the forests.

Materials and Methods

The first annual Herp Blitz began on the afternoon of 19 May and lasted until mid-day on 21 May 2006. On 19 May, six VHS members surveyed for approximately two hours. Surveys on the next day were from 0800 h until 1700 h and involved 21 volunteers. Searching on the final day ran from 0800 h until 1200 h and involved six people. A total of 225 man- hours was logged on the sites listed below. Many techniques were used, including peeling bark, turning cover objects, picking through debris piles and log piles, road cruising, dipnetting, hand capture and direct visual encounter, turtle trapping using baited hoop traps (n=3), searching through leaf litter, and listening for calling anurans. All animals collected were inspected for health and disease before being released. All information on relative numbers, health, behavior, and microhabitat was recorded for later analysis.

Study Sites (all UTM readings are in NAD83/WGS84)

Fairy Stone State Park

Site 1: Habitats included a settling pond, Hale Creek (a small perennial stream), and the surrounding riparian area. (UTM 17 578995E 4072045N)

Site 2: This site was identified after talking with one of the park rangers. He indicated that many snakes were found when park staff were collecting firewood from the storage pile. The firewood storage pile had many stacks of prepackaged firewood on pallets, covered by a tarp. The surrounding maintenance area provided opportunities to overturn various cover objects such as logs, drainage pipe, and plywood. This site was easily accessed from a small dirt road on the southeast side just outside the park entrance. (UTM 17 578639E 4072022N)

Site 3: This site included the remnants of an old spring house and a small outlet stream. Deep leaf pack was uncovered while searching for salamanders. (UTM 17 579635E 4072697N)

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Site 4: At this site we surveyed the eastern margin of Fairy Stone Lake and the surrounding cabins and mature forest. Two families showed us some of the animals they had captured during the day. (UTM 17 579665E 4072915N)

Site 5: The northwest side of Fairy Stone State Park was surveyed by following a small dirt road off Route 623. This trail winds through a mature mixed oak-pine forest. Small ephemeral streams, the western margin of Fairystone Lake, and a large debris pile were some of the unique habitats at this site. (UTM 17 579292E 4073697N)

Site 6: This site consisted of a woodland stream, surrounding mature forest, and a floodplain made from the intersection of the woodland stream and Fairystone Lake. Shelter number 5 is located adjacent to this site. (UTM 17 579663E 4072818N)

Fairystone Farms Wildlife Management Area

Site 7: Route 822 forms the eastern border of the state park. Many hiking trails can be accessed from this road. One team of surveyors accessed the state park property via some of the trails off route 822. (UTM 17 580549E 4069882N)

Site 8: This site had many diverse habitats, including three man-made marsh impoundments, a perennial stream, maintenance buildings, and a mature hardwood forest. (UTM 17 577938E 4071746N)

Results

The survey yielded a total of 28 species, including 17 species of amphibians (10 salamanders and seven anurans) and 11 species of reptiles (two turtles, two lizards and seven snakes). Seven of these species represent new county records (denoted by asterisks below).

Annotated Checklist

Amphibians

1. * *Ambystoma maculatum* (Spotted Salamander) – (sites 2, 8)

One egg mass jelly and many larvae of this species were dipnetted in a man-made pond at site 8. One large adult (35 g) was discovered in a log pile at site 2 (VHS digital photo archive # 101).

2. * *Ambystoma opacum* (Marbled Salamander) – (8)

No adult Marbled Salamanders were observed but numerous larvae were dipnetted in the same pond as the Spotted Salamander larvae. No photo voucher was taken.

3. *Desmognathus fuscus* (Northern Dusky Salamander) – (1, 3, 6, 8)

Northern Dusky Salamanders were found under leaf litter and under rocks in several small streams and one muddy seep. A total of 6 adults was captured during the survey.

4. *Desmognathus monticola* (Seal Salamander) – (3, 5, 6)

Nine adults and one juvenile were found under leaf litter and rocks at the edge of and in various streams on the state park.

5. *Eurycea cirrigera* (Southern Two-lined Salamander) – (1, 8)

Despite good habitat and much searching, only two *Eurycea cirrigera* were captured in and along streams.

6. * *Eurycea guttolineata* (Three-lined Salamander) – (4, 6)

Two adults were uncovered by flipping a rock and a log at sites 4 and 6, respectively. One adult was photographed (VHS digital photo archive #102).

7. *Plethodon cylindraceus* (White-spotted Slimy Salamander) – (8)

Only one adult of this species was found under a log by a stream on WMA property.

8. *Plethodon cinereus* (Red-backed Salamander) – (6)

Two adults were discovered under logs in a mature forest by a small ephemeral stream.

9. *Pseudotriton ruber* (Red Salamander) – (3, 6)

Adult Red Salamanders were not observed, but a total of three larvae was discovered by dipnetting leaf litter in two streams in the state park.

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10. *Notophthalmus viridescens viridescens* (Red-spotted Newt) – (1, 4, 5, 8)

Many adults and larvae were dipnetted in the ponds at site 8, in Fairy Stone Lake, and in the settling pond at site 1. Two of the adults were gravid females. One adult had an opaque eye.

11. *Bufo americanus* (American Toad) – (1, 2, 8)

Four adults were found along a settling pond, under a wood pallet holding firewood, and in grass near a maintenance building in the state park. Numerous metamorphs were captured on the paths along the edges of the man-made ponds on site 8.

12. *Hyla versicolor* (Gray Treefrog) – (8)

No gray treefrogs were captured but many males were heard vocalizing at site 8 and around the campground.

13. * *Pseudacris crucifer* (Spring Peeper) – (8)

Adults of this species evaded capture but surveyors dipnetted many tadpoles and hand-captured numerous metamorphs in and along the edge of the ponds on site 8. A metamorph was photographed (VHS digital photo archive #100).

14. *Rana catesbeiana* (American Bullfrog) - (4, 8)

One adult bullfrog was found on the edge of Fairy Stone Lake. Several males were observed calling from man-made ponds.

15. * *Rana clamitans melanota* (Northern Green Frog) – (8)

Site 8 yielded one dipnetted juvenile Green Frog and observations of calling males. The juvenile was photographed (VHS digital photo archive #98).

16. *Rana palustris* (Pickerel Frog) – (8)

Surprisingly, only one adult Pickerel Frog was captured during the survey period. It was found in a stream on site 8.

17. * *Rana sylvatica* (Wood Frog) – (8)

Rana sylvatica metamorphs were hand captured on the paths along the edge of ponds on site 8. No adults were observed. A metamorph was photographed (VHS

digital photo archive #99).

Reptiles

18. *Chrysemys picta picta* (Eastern Painted Turtle) – (4, 5)

Many adult Eastern Painted Turtles were seen through binoculars basking on logs in Fairy Stone Lake. One juvenile was found in shallow water in the same lake.

19. *Terrapene carolina carolina* (Eastern Box Turtle) – (4, 5, 6, 8)

Six adult box turtles were found in a variety of habitats, including forests along the lake shore, beside a forest road, in a timber clearing, soaking in water at a stream edge, and in the woods beside a small stream. An adult male found at site 5 had an opaque left eye.

20. *Eumeces fasciatus* (Five-lined Skink) – (5, 6)

One adult female and many juvenile Five-lined Skinks were found in a timber clearing and in a forest near a stream.

21. *Sceloporus undulatus* (Fence Lizard) – (6)

A young adult Fence Lizard was captured on a dead leaning tree on site 6.

22. *Agkistrodon contortrix mokasen* (Northern Copperhead) – (1)

An adult Northern Copperhead was found under plywood by Hale Creek.

23. *Carphophis amoenus amoenus* (Eastern Wormsnake) – (2)

A single adult Eastern Wormsnake was found under a rock in woods at site 2.

24. * *Coluber constrictor constrictor* (Northern Black Racer) – (Conference Center)

An adult *Coluber constrictor* was found in the rock wall by the state park conference center. No photo voucher was taken.

25. *Diadophis punctatus* (Ring-necked Snake) – (Conference Center)

One adult was found under bark on a fallen tree in woods by the conference center.

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26. *Elaphe alleghaniensis* (Eastern Ratsnake) – (2, 7, 8)

A total of four adult ratsnakes were discovered both on state park and wildlife management property. These animals were found on the road by the campground (SVL = 754 mm, TL = 961 mm), in grass surrounding a maintenance building on site 8, in woods off Route 822, and entangled in plastic mesh on top of a woodpile on site 2. See Mitchell et al. (2006) for an account of the entangled snake.

27. *Nerodia sipedon sipedon* (Northern Watersnake) – (4)

A park visitor (Zachary Gray) captured an adult Northern Watersnake and showed it to us while we were surveying. This animal was captured on the edge of Fairystone Lake.

28. *Thamnophis sirtalis sirtalis* (Eastern Garter Snake) – (7)

An adult Eastern Garter Snake was found foraging in the woods adjacent to Route 822.

Discussion

Most surveys of the type the Herp Blitz represents, with limited sampling techniques, limited time, and usually suboptimal weather, often miss more secretive, thermophilic, and out of breeding season reptiles and amphibians. This can be seen when viewing the preceding species list. One species that was surprisingly absent was *Chelydra serpentina*. Despite spending a lot of time in ponds, streams, and by the lake side and setting baited hoop traps, no snapping turtles were found. Perhaps future surveys of this park could devote more time toward turtle trapping to capture this species and others such as musk and mud turtles, and possibly the river cooter. Another species not recorded by this survey is *Crotalus horridus*. Historical records (W. H. Martin, pers. comm.) and accounts by park personnel indicate that this species was once a member of the park's herpetofauna. Marty Martin, a long-time timber rattlesnake expert, personally targeted this species during the survey and found none. Could this species have been extirpated from the surveyed area by overcollection and killing? More work is warranted in the WMA and state park. We only surveyed a small portion of the total land area. If Philpott Reservoir and the surrounding public watershed were included, many surveys might have to be organized to adequately survey this area.

The traditional purpose of a VHS herp survey has been to document the biodiversity of an area and the relative abundance of species. The first author believes that this rationale should change when opportunities for other types of research present themselves. During this survey it was noted that our arrival at the three Ducks Unlimited ponds on the WMA coincided with a mass emergence of anuran metamorphs. The large number of metamorphs could have been easily collected and assessed for morphological abnormalities as has been done on U.S. National Wildlife Refuges (Guderyahn, 2006). Meteyer (2000) provides a field guide to malformations of frogs and toads. The VHS should strongly consider such opportunities in the future and develop a team of disease “experts” who could provide the expertise in sampling methods, diagnosis, preservation, and documentation. Disease and health issues are the wave of future Virginia herpetology. With continued habitat destruction, pollution, and possible climate change, baseline data is needed now so that future scientists can better track problems.

As is well known, trash piles often harbor large populations of lizards and snakes. Most of the lizards and snakes found during this survey were associated with some kind of trash pile or trash on the state park land. Park managers should not be so quick to rid a WMA or state park of all these debris piles. State parks and WMA’s are often “managed” to increase the biodiversity of an area. Debris piles should be considered sound practice to increase both the biodiversity and abundance of reptiles. The same can be said of the Ducks Unlimited ponds constructed on Fairy Stone Farms WMA. Though preservationists would argue that land should be left in a natural state, many noted the tremendous abundance of amphibian tadpoles that were found at the man-made ponds. Since humans first appeared in North America, we have been continually transforming the habitat. Park managers should see in the literature the positive effects that trash and brush piles, and other management techniques, are having on herpetofauna. Finally, the VHS strongly recommends that all park and wildlife management area managers discontinue using any horticultural nylon mesh material. This often becomes a death trap when snakes become entangled (Mitchell et al., 2006).

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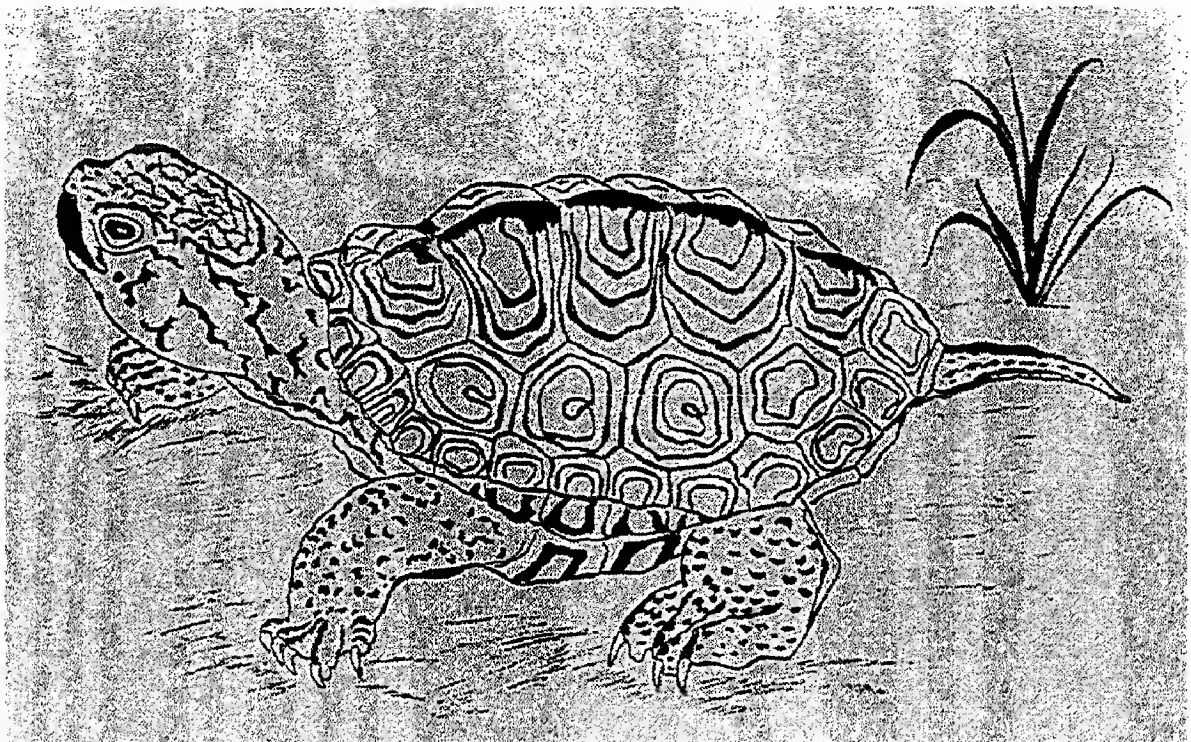
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Diamond-backed Terrapin (*Malaclemys terrapin*)

Pen-and-ink drawing by Roger Rageot (1931-2006); originally published in 1963 in the art section of the Philadelphia Herpetological Society Bulletin.

The Upland Chorus Frog (*Pseudacris feriarum*) in Virginia: A Species in Decline?

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Introduction

Are we in danger of losing the Upland Chorus Frog? Is the Upland Chorus Frog (*Pseudacris feriarum*) in serious decline in Virginia, as suggested by several studies (Ernst et al., 1997; Pollio and Kilpatrick, 2002; Sias, 2006)? In response to these questions, I conducted an extensive literature search and interviewed a number of herpetologists and researchers in the mid-Atlantic region to attempt to determine the current status of this anuran. The literature research resulted in very limited concrete evidence and few published studies on this topic, however, there appears to be substantial anecdotal evidence that this species is declining, at a minimum, on a regional basis. This paper will discuss what is known, and most importantly, what is not known about the status of the Upland Chorus Frog in Virginia.

Life History

The Upland Chorus Frog is a small anuran (19–37 mm SVL) that ranges from northern New Jersey to the Florida panhandle in the east and west to East Texas and southeast Oklahoma (Conant and Collins, 1991). *Pseudacris feriarum* is known to occur in greater density in the Piedmont and Coastal Plain provinces in Virginia (Martof et al., 1980; Tobey, 1985). Breeding occurs from February to May in Virginia (Ernst et al., 1997; Pollio and Kilpatrick, 2002). Males typically begin chorusing in late February and females arrive at ponds within two weeks under normal environmental conditions (Briggs, 1994). Most females arrive at sites over a 2-3 day period for communal breeding and deposit clusters of 40-60 eggs attached to vegetation (Conant and Collins, 1991). Eggs hatch within 3-4 days and transformation usually occurs within two months. Little is known about the activities of this species outside of the breeding season. A similar species, the Western Chorus Frog (*Pseudacris triseriata*), is found under vegetation, woody debris, and logs, in crayfish burrows, and in cracks in the ground when not engaged in breeding activity (Kramer, 1973).

The Upland Chorus Frog is a temporary wetland specialist. It prefers open grassy areas for breeding, using small ephemeral pools, roadside ditches, and other seasonally wet habitats (Pollio and Kilpatrick 2002). Temporary pools without

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fish are preferred to those containing fish (Mitchell, 1998). Ernst et al. (1997) described their habitat as “the floor of wet woodlands,” and McLeod and Gates (1998) found that *P. feriarum* was significantly less abundant in closed canopy hardwood forests than in cut-over forests. I have observed *P. feriarum* primarily in open canopy habitats, including roadside ditches and temporary pools, and in one case, in shallow pools created when two mature oak trees had fallen. It has also been noted that *P. feriarum* occasionally breeds in permanent pools with Spring Peepers (*Pseudacris crucifer*) (Webb, 1994; Briggs, 1994; Kolozsvary and Swihart, 1999; Pollio and Kilpatrick, 2002; Sias, 2006;), resulting in possible competition for resources.

Water levels are also a critical factor for successful metamorphosis of *P. feriarum*. The shallow water habitat that these frogs prefer is subject to drying and flooding, which directly impacts breeding and abundance of this species (Hecnar and Hecnar, 2002; Pollio and Kilpatrick, 2002; Briggs, 1999; Webb, 1994). Upland Chorus Frog eggs are laid near the water’s surface on vegetation; Webb (1994) observed that eggs that are deeply immersed in water do not develop well. Hecnar and Hecnar (1999) also suggest that fluctuating water levels following oviposition may increase the risk of UV-B penetration and desiccation. Although *P. feriarum* has been known to use permanent pools, it exhibits a much greater affinity for temporary pools and experiences greater reproductive success in sites without *P. crucifer* or predators (Pearman, 1995; Hecnar and M’Closkey, 1998; Pollio and Kilpatrick, 2002).

Current Status

The current status of the Upland Chorus Frog in Virginia is largely based on anecdotal information, as few research studies on this topic have been undertaken. The most significant evidence of decline is in northern Virginia, in Fairfax, Prince William, and Stafford counties (Ernst et al., 1997; Pollio and Kilpatrick, 2002; J. C. Mitchell, pers. comm.). In addition, Craig Tufts (pers. comm) observed significant declines in Loudoun County. Hoffman (1992) noted the decline of this species in western Virginia and Alleghany County, but also indicated the stability of populations in Martinsville and Greensville County. Gibson (2004) documented two sites in Greensville County where metamorphs were found in shallow roadside ditches or ruts. Discussions with field herpetologists indicated declines in the Charlottesville area (J. C. Mitchell, pers.comm.), while the population appears to be stable in southeastern Virginia (C. S. Hobson, pers. comm.). None of the 10 herpetologists interviewed indicated that they had observed any increases in *P. feriarum* populations, and unfortunately, the status of this species in the remainder of Virginia is poorly known. Historical data for *P. feriarum* contained in Tobey (1985) and Mitchell and Reay (1999) indicate a wide distribution of this species throughout Virginia,

with the exception of the Cumberland Plateau area in southwestern Virginia. No recent studies have been conducted that include wide-ranging surveys of *P. feriarum* in the Commonwealth. The Commonwealth of Virginia Comprehensive Wildlife Conservation Strategy (VA CWCS, 2006) does not list *P. feriarum* as a species requiring conservation action.

It is also important to consider the status of this species across the mid-Atlantic region to gain an understanding of status. There are indications of Upland Chorus Frog decline in southern Pennsylvania (E. Moriarty, pers. comm.), southeastern Maryland (D. Forester, pers. comm.), and West Virginia (Sias, 2006; T. K. Pauley, pers. comm.). Dr. Thomas Pauley of Marshall University (in Sias, 2006) observed *P. feriarum* historically in Greenbrier, Monroe, and Summers counties in West Virginia (along the Virginia border), but has not seen or heard this species calling in those areas since the late 1980s. Sias (2006) reported that these populations have been extirpated. West Virginia also lists the *P. feriarum* as a Species of Concern (Sias, 2006). The Pennsylvania Fish and Boat and Game Commissions' Comprehensive Wildlife Conservation Strategy (PA CWCS, 2006) lists *P. feriarum* as a Species of Special Concern, noting an "apparent decline in numbers" in the Commonwealth.

It appears that the Upland Chorus Frog is declining in the mid-Atlantic area and in some parts of Virginia. What factors affect the success of this species? As will be discussed below, there are a number of factors that may be responsible for the decline of *P. feriarum* and that may contribute to its inability to sustain or restore healthy populations.

Likely Causes of Decline

Habitat Loss and Fragmentation

The first and most serious cause of decline for *P. feriarum* is habitat loss and fragmentation (Ernst et al., 1997; Sias, 2006; J. C. Mitchell, pers. comm.; C. Tufts, pers. comm.; C. Hobson, pers. comm.). More than 42% of Virginia's non-tidal wetlands have been lost since 1780 (VIMS, 2006). In addition to habitat loss, urban development, particularly in Virginia, has destroyed valuable amphibian habitat. According to C. Tufts (pers. comm.), one factor may be the loss of diabase soil formations that are stripped away during construction activities. Removal of these clay-containing subsoils, which would normally retain the water necessary for ephemeral pool breeders, results in the loss of these shallow wetland types. Development in some areas in Virginia is proceeding at a rapid pace. Since 1970, the population of Virginia has increased 50% to approximately 7.3 million (SELC, 2002), with an additional 1.5 million expected by the year 2025. In fact, the rate of land consumption in the state has been 2.5%

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greater than the rate of population growth (SELC, 2002). A direct impact of urban development is destruction and filling of roadside ditches, the primary habitat of *P. feriarum* (Hoffman, 1992; Ernst et al., 1997).

Agricultural areas, which provide edge habitat routinely used for breeding by Western Chorus Frogs (*P. triseriata*) (Kolozsvarly and Swihart, 1999), are rapidly being converted from rural to urban/suburban use in Virginia. Between 1982 and 1997, more than 830,000 acres of agricultural land was converted for development (NRCS, 1997).

The use of technology in agricultural practices may also be having serious consequences for *P. feriarum*. In one type of prescription farming known as precision leveling, farmers use technology that allows disking equipment to raise and lower as the landform beneath it changes. The result is a field that is plowed almost perfectly flat, eliminating areas that previously collected water suitable for amphibian breeding. The practice of “precision land-leveling” or “precision farming” has been identified as a major factor responsible for the extirpation of the Illinois Chorus Frog (*Pseudacris streckeri illinoensis*) in Arkansas (Trauth et al., 2006). Although the Upland Chorus Frog does not burrow into the ground like the Illinois Chorus Frog, field leveling can have significant effects on breeding habitat, especially as this practice becomes increasingly popular in Virginia (Burke, 1998).

In concert with development-related habitat loss, an increase in road construction is likely to reduce *P. feriarum* numbers for a variety of reasons, including fragmentation of habitat, introduction of chemicals such as road salt into breeding pools, and individual mortality from crossing roads to breed and forage (Forman et al., 2003). Road salt and de-icing products may, in particular, affect *P. feriarum* because one of its preferred breeding habitats is roadside ditches (Hoffman, 1992). Road improvement projects frequently result in filling, draining, and upgrading roadside ditches, greatly reducing prime *P. feriarum* habitat (Hoffman, 1992; Ernst et al., 1997). In addition, Hoffman (1992) suggests that the increase of motor vehicles in the Ridge and Valley Province of Virginia since the 1950s significantly increased road mortality of Upland Chorus Frogs.

Given these factors, it is possible to make correlations between habitat loss, development, and human population growth. An especially interesting fact is that the areas experiencing the greatest growth in Virginia are northern Virginia and Charlottesville at 25% and 21% in the last decade, respectively (SELC, 2002). The link between strong growth in these areas and apparent declines in *P. feriarum* populations supports the observations of Ernst et al. (1997), Pollio and Kilpatrick (2002), C. Tufts (pers. comm.), K. Briggs (pers. comm.), and J. C. Mitchell (pers. comm.).

Erratic Weather Patterns

Erratic weather patterns, such as droughts, floods, and spring blizzards have been known to affect amphibian reproductive success (Briggs, 1994; Ernst et al., 1997; Hecnar et al., 2002; Sias, 2006; Trauth et al., 2006). This is especially true for *P. feriarum* because of its preference for shallow pools that dry quickly without consistent rainfall. Sias (2006) suggests that excessively high temperatures in addition to periodic droughts may have caused *P. feriarum* populations to decline in West Virginia. Briggs (1994) also documented a failed breeding season for this species as a result of a late spring blizzard.

Several studies have suggested that drought and the associated changes in hydroperiod favor a decrease in chorus frog populations and an increase in Spring Peeper populations (Webb 1994; Hecnar and Hecnar 2002; Pollio & Kilpatrick 2002). Spring Peepers are generally associated with deeper, more permanent pools, while Upland Chorus Frogs appear to prefer more shallow, ephemeral ones. Although these two species appear to prefer different habitats, C. Ernst (pers. comm.) suggests that significant droughts in Virginia over the past decade may have forced *P. feriarum* to use less-than-preferred habitats, resulting in a significant reduction in their numbers. Because this species has a short life span (2 to 3 years), large reductions in populations can have devastating effects.

Erratic weather patterns can also cause Upland Chorus Frog and Spring Peeper breeding seasons to overlap considerably (Briggs, 1994). High interspecific competition for breeding sites and the difficulty of hearing and locating a mate in pools dominated by *P. crucifer* have also been mentioned as potential causes of *P. feriarum* population decline (Webb, 1994; Briggs, 1994; Pollio and Kilpatrick, 2002). Duellman and Trueb (1986) reported that mating success in *P. triseriata* males is low, around 17.2%. Coupled with environmental and human pressures, a comparably low level of mating success may have contributed to the decline of *P. feriarum* throughout its range. In their studies of ponds in Ontario, Hecnar and Hecnar (2002) found that the only amphibian species that had increased their numbers substantially, despite fluctuating weather patterns, were Spring Peepers. Even when periodic droughts reduced populations of other anurans, *P. crucifer* showed continual population growth; from 62%-97% in 10 years. It appears from these data that *P. crucifer* in Ontario has a competitive advantage over *P. feriarum*. Further evidence of this was noted by Webb (1994) who observed that in established pools, *P. feriarum* populations declined once *P. crucifer* became abundant.

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Predation

In general, larval amphibians are easily preyed upon by fish, large insects, and other amphibians; the larger the body of water, the greater number and diversity of potential predators (Webb, 1994; Pearman, 1995; Hecnar and M'Closkey, 1998; Rubbo and Kiesecker, 2005). Pearman (1995) found that predacious *Dytiscus* beetle larvae had a substantial negative effect on the survival of chorus frog tadpoles. In fact, the larger the pond, the greater the predation pressure exerted on chorus frogs by beetles. It is well known that ponds that contain fish have reduced amphibian species richness (Hecnar and M'Closkey, 1998; Rubbo and Kiesecker, 2005). Hecnar and M'Closkey (1998) observed chorus frogs in ponds with fish only when there was significant vegetative cover available for them to escape predation. My observations in northern Virginia supported these findings. In Pennsylvania, Webb (1994) found similar results; in deeper pools where Green Frogs (*Rana clamitans*) were present, they served as a key predator of *P. feriarum*.

Skelly's (1995) study of *P. triseriata* and *P. crucifer* interactions shed more light on the issue of competition between these two species. Rather than interspecific competition, he suggested that pond drying and predation were responsible for the differences in the survivorship between these species. Chorus frogs were "more active, grow and develop faster, appear to be less susceptible to pond drying but more susceptible to predators" than Spring Peepers and also tended to be distributed in less permanent ponds (Skelly, 1995). The ability of chorus frogs to develop rapidly is a useful attribute in temporary ponds, where the inability to reach metamorphosis quickly would result in death. In permanent ponds, however, the more active chorus frog tadpoles are at increased risk of predation than the slower developing and moving Spring Peepers (Skelly, 1995). The difference in activity levels of chorus frogs calls attention to them, versus the slower, more easily overlooked Spring Peeper tadpoles.

If droughts and disappearing habitat for chorus frogs force them to use larger pools for breeding, then the combined effects of competition with other species, and predation may contribute significantly to their population decline.

Inability to Repopulate Areas

Although amphibian populations sometimes fluctuate dramatically from year to year within a region (Duellman, 1999), their ability to recolonize an area in subsequent breeding seasons is critical to their long-term survival. Gibbs (1998) studied amphibian distribution along a forest fragmentation gradient and concluded that species' biological traits, their individual fragmentation tolerance, population density and variability, and mobility were the factors that predisposed

them to local extinction. Sias (2006) suggests that this is a primary reason *P. feriarum* is no longer found in the southern counties of West Virginia adjacent to the Virginia border. Erratic weather events in the form of droughts and high temperatures, coupled with the small size, short lifespan, and limited mobility of *P. feriarum* have affected the ability of this species to recolonize areas from which it was extirpated (Sias, 2006). These factors will almost certainly affect Virginia's chorus frog populations as they become more isolated due to habitat fragmentation and destruction and begin to feel the pressures of human population growth.

Wetland Mitigation

Given the habitat requirements of *P. feriarum*, the current practice of constructing mitigation wetlands may also be impacting this species. Porej and Hetherington (2005) surveyed all replacement wetlands constructed as mitigation in Ohio since 1990 and found that 52.4% contained predatory fish and 42.7% did not provide shallow littoral areas, a key ecological attribute for amphibian reproduction. They concluded that current wetland replacement practices are likely to have a negative effect on amphibian diversity. This would be especially true for *P. feriarum*, since replacement wetlands are nearly all permanent ponds.

According to the U.S. Fish and Wildlife Service National Wetlands Inventory (2005), between 1994 and 2000, there was a net loss of 2,545 acres of vegetated wetlands in southeastern Virginia, while nonvegetated wetlands (mainly ponds) increased by about 450 acres. Forested wetlands encompassing 3,306 acres were lost (2,100 of them permanently to development) and 1,100 acres of new palustrine emergent wetlands became established. These data reflect two trends. The first is the loss of vegetated wetlands to development and the subsequent establishment of permanent ponds used for wetland mitigation and as holding ponds for surface runoff. The second trend is primarily the result of timber harvesting, which reduces forested wetlands and temporarily (for at least 20 years) replaces them with emergent wetlands in the cut-over areas.

While these data only represent a small portion of Virginia, they highlight the challenges facing a species that prefers temporary wetlands for reproduction. Conversion of natural wetlands to permanent, unvegetated ponds clearly favors Spring Peepers and the establishment of fish populations. The practice of timber harvesting may create some Upland Chorus Frog habitat in the short-term, but it is at the expense of many other species dependent on forested wetlands. Wetlands are extremely difficult to identify below 0.5 acres using the standard methodology of aerial photo interpretation (USFWS, 2005). Given that many temporary wetlands are smaller than 0.5 acres, and assuming that the home range size of *P. feriarum* is similar to that of *P. triseriata* (average = 0.523 acres;

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Kramer, 1973), it is likely that current methodologies do not accurately capture the effect of wetland losses on *P. feriarum*.

The only encouraging note is that recent changes in wetland regulations may significantly reduce wetland losses in Virginia. In 2001, the “Tulloch Rule” was reinstated, which requires a permit for heavy equipment to clear wetlands; the U.S. Army Corps of Engineers nationwide permit that allowed wetlands up to 10 acres to be filled with only notification (rather than approval) was eliminated; and finally, the Virginia General Assembly authorized the Virginia Department of Environmental Quality to regulate nontidal wetlands through the Virginia Water Protection Permit Program (Tiner et al., 2005). These changes will hopefully increase wetland protection throughout the State. Changing the current practice of creating mitigation wetlands in the form of permanent ponds to one that conserves a wider range of amphibian habitats, however, will require significant effort.

Conclusion

Based on a combination of anecdotal and research data, it appears that *Pseudacris feriarum* may be in serious decline in certain regions in Virginia, particularly in northern and western Virginia and the Charlottesville area. It appears that this species is also in decline throughout its historic range in Maryland, Pennsylvania, and West Virginia. The destruction of prime breeding habitat, erratic fluctuations in rainfall, periodic droughts, and changes in agricultural practices, combined with the inability of this species to readily recolonize previous breeding sites have taken its toll on *P. feriarum*. The marginal habitat that this species is often forced to use for breeding is ill-suited to its developmental characteristics, which in turn expose it to increased competition and predation. Explosive development throughout much of Virginia, but particularly in the northern and central part of the state, appears to have degraded or eliminated some of the best *P. feriarum* habitat available. Without intervention, the factors affecting this species will continue to further fragment populations and ultimately threaten its existence throughout the Commonwealth. There is still time, and several research needs and management strategies could be employed to focus our efforts to ensure this species' continued existence in Virginia.

First, studies are needed to resurvey historic breeding sites of *P. feriarum* and determine if those populations still exist, such as the one recently completed by Sias (2006) in West Virginia. The condition and quality of suitable *P. feriarum* habitat needs to be detailed statewide. Wetland inventory data that capture ephemeral pools smaller than one acre would be extremely useful to monitor loss of breeding habitat throughout Virginia. This alone is a massive task. Research must continue to be done that determines the effects of Best Management

Practices, wetland mitigation, precision farming, and other practices on amphibian conservation. Management strategies should be developed that address the many factors affecting *P. feriarum* populations.

Regional Habitat Management Guidelines have recently been published by Partners for Amphibian and Reptile Conservation and may help guide future efforts in this area (PARC, 2007). However, more can always be done on the ground and in the community to restore chorus frog habitat. For example, the Missouri Department of Conservation (MDC, 2000) has developed some simple Best Management Practices specifically for the Illinois Chorus Frog. Restoration of temporary wetlands through programs like National Wildlife Federation's Backyard or Schoolyard Habitats, the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife programs, or others, may help to provide habitat necessary to support *P. feriarum*. It will take the efforts of many to fully determine the status of this species in Virginia, and many more to make the changes necessary to ensure its survival into the future.

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Status and Distribution of the Mediterranean Gecko (*Hemidactylus turcicus*) in Virginia

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The Mediterranean Gecko (*Hemidactylus turcicus*) is native to the Mediterranean area but included on the North American Introduced Species Checklist (http://www.cnah.org/ex_nameslist.asp) because of its human-mediated dispersal. It was first reported in the United States from Key West, Florida (Fowler, 1915). Meshaka et al. (2006) recently summarized records from Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina, Texas, and Virginia. Additional records have more recently been reported from these same states and from Arizona (Goodward et al., 2005), California (Beaman et al., 2005), Kansas (Hare, 2006), Missouri (Bufalino, 2004), Nevada (Reed et al., 2006a), New Mexico (Sias and Humhrey, 2002; Murray and Painter, 2003) and Utah (Reed et al., 2006b).

This species disperses readily by human activity (Meshaka et al., 2006). It is hypothesized that eggs are the major but not exclusive life stage being dispersed, often with produce or vegetation. Populations are usually found in the South, associated with masonry buildings and dim lighting where individuals feed on arthropods and seek refuge. Since populations in Louisiana remain active down to ambient temperatures as low as 3.3°C (Rose and Barbour, 1968), there has been considerable speculation as to how far north the species could potentially spread (Bauer, 2000). Because populations typically occupy heated, inhabited buildings there is a refugia against harsh winter climates.

Recently, Kleopfer et al. (2006) made the claim of reporting both the northernmost and the first record in Virginia for *H. turcicus*. Actually, their record is the second for Virginia, with Knight (1993) taking precedence describing a population on the campus of Virginia Tech at Blacksburg. Also, the most northerly population to date appears to be one from Baltimore, Maryland

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(Norden and Norden, 1991), approximately 240 km north of Richmond.

Here we report three additional populations from Virginia, two from the City of Lynchburg and one from nearby Bedford County and comment on its status as an established member of the Virginia herpetofauna. In the late 1990s, Grace Evangelical Free Church moved into a building at 3225 Old Forest Road in Lynchburg. Between 2004 and 2006, eight juvenile *H. turcicus* were brought to CL from the church. Most were captured on interior walls within the building. One was found crushed to death at the front door. At least one other gecko was found in leaf litter under a board next to the building and another on an exterior wall. Since the majority of individuals were juveniles, and they were captured over a period of two years, we assume this represents a breeding population. Vouchers are deposited in the Liberty University Natural History Museum (# 654-657, 659). The source of the initial introduction is unknown. The building was previously used as a clothing warehouse and distribution center. It is approximately 50 m from another building that was a major chain grocery store 20 years ago, but has been unoccupied since then. Because geckos may be transported in produce, this is a possible source of the introduction. However, they are not known to cross open areas to colonize new buildings. We do not have access to the interior of this other building and the entire area, including all of the buildings, is scheduled to be torn down for new construction in the summer of 2007.

In September of 2006, one of us (PS) asked the personnel at Pet and Aquatic Warehouse, a commercial pet store at 2408 Wards Road in Lynchburg if they ever sold Mediterranean Geckos. They responded that they did in the past but not currently, and reported that there was a breeding population in the basement of the building where the humidity from the fish tanks was high and the illumination was low. Juveniles were occasionally captured if there was interest. Upon request, two individuals were produced a week later. One specimen is vouchered in the Liberty University Natural History Museum (# 658) and the other is being maintained in captivity. From this example, one can see how escaped animals from a commercial pet store could establish a thriving population, feeding on escaped crickets according to store employees. This population is at least several years old. It conforms to the typical habitat for Mediterranean Geckos, being a masonry building with low light. This colony, likewise, has a supplemented food supply and high humidity.

One of the authors (KH) recently secured a job teaching biology at Liberty High School in Bedford County. There, several specimens of *H. turcicus* were captured in and around the science building during the Fall of 2006. Three individuals were captured inside the building in classrooms and four more were captured on the outside of the building, two under a garbage can and two on the

wall. Two more individuals were found dead inside the building at a back door and one was found dead inside a storage room. Several of the live specimens are currently in captivity. Other science faculty and the science building custodian have reported sightings in classrooms. Inquiries as to the history of the population from other science instructors indicate that specimens have been observed since the current building was constructed in 1988. A probable source of this colony is escapees from a terrarium. A photo voucher is deposited in the VHS Archives (digital voucher #96) and specimen vouchers in the Liberty University Natural History Museum (#661, 662).

We believe that the occurrence of *H. turcicus* in Virginia is much more widespread than previously thought. This species is capable of inhabiting the remote portions of most buildings, and incidentally dispersed by humans. The Grace Evangelical Free Church has recently moved to a larger building. It will be interesting to see whether geckos appear in a year or two in their new facility. We encourage Virginia Herpetological Society members to be alert for reports of geckos in their own localities. We have unconfirmed reports of additional sightings at other sites in central Virginia. From our findings and those in the literature, it appears that *H. turcicus* is an established member of the Virginia herpetofauna, with a final geographic distribution that has yet to be realized. For this reason we recommend that additional sightings be reported to the Virginia Department of Game and Inland Fisheries, where J. D. Kleopfer (john.kleopfer@dgif.virginia.gov) is currently the non-game specialist for amphibians and reptiles.

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FIELD NOTES

Bufo fowleri (Fowler's Toad). VA: Accomack Co., Assateague Island, (37° 54' 37.8" N; 75° 21' 19.9" W). 4 January 2007. Storrs L. Olson and Johanna R. Humphrey.

The first part of the winter of 2006-2007 was notable for abnormally warm temperatures in northeastern North America. Although it would not be unexpected that this would have an effect on terrestrial poikilotherms, it is nevertheless worth documenting. On 4 January 2007 between 1100 and 1200 h, Johanna R. Humphrey and I observed and photographed a small (ca. 40 mm) Fowler's Toad (*Bufo fowleri*) hopping over a bare patch of sandy soil about 30 m north of the lighthouse on Assateague Island. The surrounding habitat was loblolly pine (*Pinus taeda*) forest. At this time the temperature was about 62° F (16.7° C) with a clear sky and light wind. At nearby Wallops Island on the same date the minimum, maximum, and mean temperatures were 41°, 65°, and 53° F (5°, 18.3°, and 11.7° C).

Fowler's Toad is the only species of Bufonidae recorded from Assateague Island, where surface activity in this species has been observed from 16 April to 9 October (Mitchell and Anderson. 1994. Amphibians and Reptiles of Assateague and Chincoteague Islands. Virginia Museum of Natural History, Martinsville, VA. 120 pp.). Thus, our observation falls squarely in the middle of the known period of normal winter inactivity of this species at this location.

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Gastrophryne carolinensis (Eastern Narrow-mouthed Toad). VA: Franklin Co., Ferrum, Ferrum College Campus. 0.4 km (0.25 miles) NW of Chapman Pond (36° 56' 22'' N, 80° 01' 64'' W). Elevation 422 m (1370'). 14 September 2006. Todd Fredericksen and Mary Beth Webb.

On 14 September 2006 at 1300 h, an Eastern Narrow-mouthed Toad (*Gastrophryne carolinensis*) was captured in a pitfall trap established to monitor the abundance and diversity of small vertebrate animals in areas with differing levels of coarse woody debris. In Virginia, this species primarily occurs in the Coastal Plain region with only a few records west of the Fall Line. This is the first documented occurrence of this species in Franklin County (Mitchell and

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Reay. 1999. Atlas of Amphibians and Reptiles in Virginia. Virginia Department of Game and Inland Fisheries, Special Publication No. 1, Richmond, VA. 122 pp.).

The habitat where the toad was captured was on gently sloping terrain dominated by mature forest. The most common tree species on this site included tuliptree (*Liriodendron tulipifera*), white pine (*Pinus strobus*), and red maple (*Acer rubrum*). The understory vegetation was dominated by white pine seedlings and saplings with some mountain laurel (*Kalmia latifolia*) in the vicinity. There was a thick leaf litter covering the soil. Weather conditions at time of discovery were sunny with ambient temperature of 23.9° C (75° F), but the toad could have been captured at any time within the previous 24 hours. Snout-vent length was 23.0 mm. A digital image has been deposited in the VHS archives (digital voucher #95).

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Hyla squirella (Squirrel Treefrog). VA: City of Newport News, Oyster Point, 11836 Fishing Point Drive. 17 August 2005. Kory Steele. VA: City of Hampton, Sandy Bottom Nature Park. 14 June 2006. Patricia Crane and Emily and Elijah Cole.

On 17 August 2005, one *Hyla squirella* was found inside the foyer at the office of Environmental Specialties Group, Inc in the Oyster Point area of Newport News. No other specimens were found that year. On 23 June 2006, nine separate choruses were present within 2 km of the original capture site. Calling males were mostly concentrated in a network of stormwater management ditches. Many of the ditches were filled with >1 m of water and contained emergent vegetation. Other choruses were found at the Port Warwick development (adjacent to Oyster Point) in a ponded area that was recently cleared for construction. Calling males were also heard in a roadside puddle (1 m diameter, ca. 15 cm deep) and flooded grass swales. Advertisement calls were heard as late as 2 September 2006.

The Oyster Point area and Port Warwick are highly urbanized office parks with high-density residential developments and provide very little natural habitat for adult treefrogs and reproduction. Historically, much of Oyster Point was wetlands, providing a source for the current population of amphibians (about nine species, pers. obs.), that apparently rely on the remnant wetlands (stormwater ditches) to reproduce. According to the City of Newport News online GIS Map Viewer (<http://gis.nngov.com/gis>), the Oyster Point area contains approximately 185 km (115 mi) of ditches that are regularly flooded and support the growth of hydrophytic vegetation. Some of these ditches can be quite large, up to 2 m deep and 7 m wide.

Another population of *Hyla squirella* was found at Sandy Bottom Nature Park, a 456 acre wildlife management area approximately 4.5 km (2.8 mi) from the Newport News population. This area was formerly a borrow pit and garbage dump, but has recently been used for wetland mitigation and wildlife conservation. Approximately 20 males were heard calling on 14 June 2006 in a recently constructed (spring of 2006) wetland area adjacent to the "Wetland Trail", dominated by emergent vegetation. Note how quickly (several months) this created wetland was colonized by *H. squirella*.

According to Mitchell and Reay (1999. Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Virginia Department of Game and Inland Fisheries, Richmond, VA. 122 pp.), *Hyla squirella* has not been previously recorded from the cities of Newport News or Hampton, although it has been found in neighboring James City County to the northwest. The squirrel treefrog reaches its northern distributional limits in southeastern Virginia (Mitchell and Reay, op. cit.).

The findings reported above are consistent with Hoffman's (1994. Field Notes: *Hyla squirella*. Catesbeiana 14: 14-15) account of *H. squirella*, and published descriptions of preferred adult and breeding habitat, and typical activity (Wright and Wright. 1949. Handbook of Frogs and Toads of the United States and Canada. Cornell University Press, Ithaca, NY. 640 pp.; Martof et al. 1980. Amphibians and Reptiles of the Carolinas and Virginia. University of North Carolina Press, Chapel Hill, NC. 264 pp.; Conant and Collins. 1998. A Field Guide to Amphibians and Reptiles of Eastern and Central North America. Houghton Mifflin Company, Boston, MA. 616 pp.).

All observations of *H. squirella* were made after storm events. On 17 August 2005, Newport News received 3.7 cm (1.4 in) of rain in the previous two days. Hampton received 5.7 cm (2.3 in) of precipitation on 14 June 2006. An interesting observation was that *H. squirella* was always found calling with *Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad) in Newport News, but never with *Bufo fowleri* (Fowler's Toad) or *Hyla cinerea* (Green Treefrog)

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that were also calling. In Hampton, *H. squirella* was not segregated from these other two species. The breeding habitats in Newport News were all relatively similar, so further investigation into this phenomenon is warranted.

The identity of the *Hyla squirella* captured in 2005 was verified by Dr. Barbara Savitzky. A digital photograph of a Hampton specimen was submitted to the VHS archives (digital voucher #30), and the original specimen was deposited in Christopher Newport University's herpetological collection (catalog # 200501).

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Nerodia sipedon sipedon (Northern Watersnake). VA: Fairfax Co., junction of Popes Head Creek and Route 645 [38° 46' 55.28" N, 77° 23' 16.84" W (NAD 83)]. 25 June 2006. Mark Khosravi.

On 25 June 2006 at approximately 2100 h (air temperature 23° C), I observed a large female Northern Watersnake (*Nerodia sipedon sipedon*) on Newman Road in southwestern Fairfax County, Virginia, that was squirming in a manner suggesting that it had been hit by a car. It was a dark night and had been raining steadily, with the nearby creek, Popes Head, about to overflow its banks. Upon closer inspection, I determined that the snake had not been struck, but rather was writhing about, trying to scavenge a road-killed toad (*Bufo* sp.) from the road surface. There were numerous DOR toads on local roads that night. The snake (VHS digital archives #97) was so preoccupied with scavenging the toad that it did not react to my approach and was easily captured without striking.

Necrophagy has been documented in 35 species of snakes (Devault and Krochmal. 2002. Scavenging by snakes: an examination of the literature. *Herpetologica* 58: 429-436). These authors cite only one published account of a wild Northern Watersnake scavenging; in that observation the prey item was a small fish (Raney and Roecker. 1947. Food and growth of two species of watersnakes from western New York. *Copeia* 1947: 171-174). A review of Gibbons and Dorcas (2004. *North American Watersnakes: A Natural History*. University of Oklahoma Press, Norman, OK. 437 pp.) and Mitchell (1994. *The Reptiles of Virginia*. Smithsonian Institution Press, Washington, DC. 352 pp.) yielded no accounts of scavenging for this species. To my knowledge this is the first documented observation of a Northern Watersnake consuming a dead toad from a road. Northern Watersnakes have a keen olfactory sense and utilize tongue flicking when foraging (Gibbons and Dorcas, op. cit.). Since many

anurans are observed on rainy nights and are killed by vehicular traffic, perhaps necrophagous behavior could be a cause of increased road mortality for this snake species.

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Thamnophis sirtalis sirtalis (Eastern Gartersnake). VA: Clarke County, University of Virginia's Blandy Experimental Farm, 4 km S Boyce. 10 and 30 January 2006. Carrie Seltzer.

Eastern Gartersnakes are well known for emerging from hibernation earlier than most other snakes in the mid-Atlantic (Rossman et al. 1996. *The Garter Snakes, Evolution and Ecology*. University of Oklahoma Press, Norman, OK. 332 pp.; Ernst and Ernst. 2003. *Snakes of the United States and Canada*. Smithsonian Institution Press, Washington, DC. 668 pp.). Mitchell (1994. *The Reptiles of Virginia*. Smithsonian Institution Press, Washington, DC. 352 pp.) reported that the earliest known date of activity in Virginia was 28 January and the latest was 9 December. We report here an extension of the earliest known activity date in the northern Blue Ridge Mountains in Virginia.

On 10 January 2006, an adult *T. sirtalis* was killed on a gravel road near a wetland surrounded by a warm season grass meadow and some low woody growth at Blandy Experimental Farm, Clarke County, Virginia. Coordinates were 39° 03.646' N, 78° 03.620' W. Daytime maximum air temperature on 9 January was 21° C and the low was 0° C. Air temperature on 10 January was 13° C and the low that night was -1° C (weather station at Blandy Farm). A second adult Eastern Gartersnake was observed alive at midday on 30 January in rocks on a south-facing, dry stacked limestone wall. Most of the area around the wall is mulched plant beds, mature ornamental trees, and mowed lawn. Coordinates were 39° 03.812' N, 78° 03.870' W. Maximum air temperature was 17.5° C that day; the temperature dropped to 0° C that night.

The 10 January 2006 road-kill now stands as the earliest known date of activity of an adult *T. sirtalis* in Virginia. It is likely that the warm temperature on the day preceding the observation stimulated the snake to leave its hibernaculum. Why it moved away from its hibernaculum and moved onto the road is unknown. The second snake observed on 30 January behaved like other snakes in winter by exposing itself to warm to likely thermoregulate near its overwintering site and not moving away. Observations such as these provide some insight into the thermoregulatory behavior of *T. sirtalis* in the Virginia mountains. A

FIELD NOTES

radiotelemetry study of Eastern Gartersnakes at Blandy Farm would reveal activity and movement patterns that may explain why some snakes stay near hibernacula in winter and why some move away from them.

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Kinosternon subrubrum (Eastern Mud Turtle). VA: James City Co., York River State Park, 37° 25' 30" N; 76° 43' 50" W. 28 April 2007. Mary Apperson, Stephen Living, and Timothy P. Christensen.

On 28 April 2007 at approximately 1315 h, an Eastern Mud Turtle was observed consuming a fiddler crab (*Uca* sp.) in a tidal wetland at York River State Park. Skies were overcast and the air temperature was about 18° C (65° F). The observation was made approximately 50 m from the York River shoreline. The immediate area contained saturated soils though no standing water and was dominated by salt meadow cordgrass (*Spartina patens*), salt meadow rush (*Juncus gerardii*), and marsh elder (*Iva frutescens*). Stands of big cordgrass (*Spartina cynosuroides*) and seaside goldenrod (*Solidago sempervirens*) also exist. At approximately 1345 h, a second mud turtle was observed approximately 30 m from the first specimen. Conant and Collins (1998. *A Field Guide to Reptiles and Amphibians of Eastern and Central North America*. Houghton Mifflin Co., Boston, MA. 616 pp.) and Martof et al. (1980. *Amphibians and Reptiles of the Carolinas and Virginia*. University of North Carolina Press, Chapel Hill, NC. 264 pp.) note that this species tolerates brackish water and is frequently abundant in tidal marshes. According to Mitchell (1994. *The Reptiles of Virginia*. Smithsonian Institution Press, Washington, DC. 352 pp.), Eastern Mud Turtles utilize several aquatic habitats including brackish marshes. Our observations confirm this habitat use. The thick growth of salt meadow cordgrass or other dominant vegetation does not appear to impede movement or foraging of this small species.

Martof et al. (op. cit.) characterize this species as a nocturnal forager that remains hidden during the day though our observation reveals diurnal feeding activity. Conant and Collins (op. cit.) and Martof et al. (op. cit.) indicate that insects, mollusks, carrion, and vegetation comprise the primary diet; however, fiddler crabs are not included. Mitchell (op. cit.) notes that crayfish are included in the diet of adults. Ernst et al. (1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, DC. 578 pp.) report that crustacean prey of *K. subrubrum* includes crayfish, amphipods, isopods, and ostracods. Fiddler crab prey would not necessarily be unexpected but has not been documented previously.

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OBITUARY
Roger Henry de Rageot
(1931-2006)

An article on Roger Henry (or Henri) de Rageot in the *Virginian Pilot* after his death noted that he never lived a normal life. That was an understatement. Roger was well known for his Spartan life in the Norfolk, Virginia, area where he lived most of his life after emigrating from Europe, and for his propensity to eat road kills and snakes. He was one of the old-time naturalists who was equally at home in the arts. Indeed, many of his writings were as much artistic flair as they were scientific papers. He has been called a naturalist, explorer, museum curator, photographer, painter, author, and eccentric. In fact, he was all of these things. .

Roger Rageot (Figure 1) was born in France on 22 June 1931, and grew up in the Charolais cattle region. He endured the German occupation there during World War II and caught wild game for food. Roger and his sister emigrated and arrived in the United States by ship in 1947 to settle in Maryland. He finished high school at the Sacred Hearts High School in La Plata, Maryland, where he learned



Figure 1. Roger Rageot in the 1950s at the Norfolk Museum of Natural History with the characteristic scarf around his neck. Photographer unknown.

English. He took some zoology courses at Washington University during 1949-1952 and at the College of William and Mary in 1952-1956, but did not attain a college degree. He worked with the Smithsonian Institution mammal collection before moving to Virginia. He got the curator job at the Norfolk Museum of Natural History in 1951 and worked there until 1967. Roger attended Old Dominion College (now University) part-time between 1952 and 1956. He spent 1957-1958 in France where he obtained a degree in "License of Natural Science."

Roger was initially paid as a night watchman at the museum but worked on natural history exhibits during the day. He did his own taxidermy, collected his own specimens, built the dioramas, and educated the public through lectures to school groups and public speaking. He was an invited member of the American Association of Museums in 1954. Roger's home was a Norfolk apartment in Gent where he kept several animals, including an adult Gila Monster (*Heloderma suspectum*) given to him by Howard K. Gloyd.

Funding was tight at the museum and Roger supplemented his income by collecting specimens of all sorts for profit by selling them to researchers and museums. Numerous specimen labels on snails, insects, millipedes, birds, bats, other mammals, fish, and of course amphibians and reptiles remain extant in several museums. He also sent specimens free to researchers like Howard K. Gloyd who was studying copperheads and cottonmouths and Roger Conant who was studying watersnakes. And, of course, he supplemented his diet with road kills and the occasional Snapping Turtle (*Chelydra serpentina*, Figure 2). Roger applied to other museums throughout the country in 1956 and 1962 to apparently gain better wages and even received an offer or two, turning them down to stay in Tidewater.

Roger created watercolor paintings that ultimately sold for hundreds of dollars. Some of his pen-and-ink illustrations appeared on the cover and in the Art Feature of the Philadelphia Herpetological Society (PHS) Bulletin in 1963 and in Virginia Wildlife in 1964. The PHS Bulletin cover illustration of a Green Treefrog (*Hyla cinerea*) is reprinted on page 2 of this issue, and a Diamond-backed Terrapin (*Malaclemys terrapin*) drawing appears on page 23. Photos of a Canada Warbler (*Wilsonia canadensis*), Whitetail Deer fawn (*Odocoileus virginianus*), Copperhead (*Agkistrodon contortrix*), and thorn bugs were published recently in *The Nature Handbook* by E.H. Williams, Jr. (Oxford University Press, 2005).

Unfortunately, in 1967 the museum's board did away with the natural history section and made it into an exclusively art museum. There was a big public outcry but the natural history museum and Roger were history. Roger then took whatever inheritance he had, bought a Toyota Land Cruiser and lots of supplies,

OBITUARY: ROGER RAGEOT



Figure 2. Roger Rageot in the 1950s on his scooter with a Snapping Turtle (*Chelydra serpentina*) headed home for dinner. Photographer unknown.

and wandered throughout much of Central and South America for two years. He traveled, usually alone, through most of the countries in Central America, being robbed in British Honduras along the way. His first destination was French Guiana for which he carried a letter of introduction from the Secretary of the Smithsonian, S. Dillon Ripley. The Smithsonian Institution provided collecting supplies so that Roger could collect specimens in remote places. He was back in the United States in 1971 seeking funding for another tropical expedition.

His 1973 Peace Corps year was spent in Chile where he taught and worked on seeking ways to control Vampire Bat predation on cattle. He and a colleague ingeniously mixed a poison with petroleum jelly to apply to the bats' backs. They would fly back to their roosts and groom each other, infecting as many as 50 others. It was very effective. Roger remained in South America until 1980. He apparently contracted Hodgkin's disease later that year and came back to the United States to be treated successfully. He was not considered in remission until 1984 when he returned to Norfolk for semi-retirement. Roger remained active in local natural history excursions and occasionally spent time in Ecuador until he was too frail and weak to travel again. His cancer apparently came back in 2006 and he died from that and respiratory disease on 7 October 2006.

Roger Rageot was a co-founder of the Virginia Herpetological Society and its third president, following Dr. John Thornton Wood and then W. Leslie Burger. He served from 1963 to 1964. He contributed several articles, especially one on the amphibians and reptiles of Surry County, Virginia (Rageot, 1965). He worked as the naturalist and director for several summers at the Pipsico Boy Scout Reservation and reported valuable natural history observations on the county's herpetofauna. He later (Rageot, 1969) reported on three rare species from Surry County – Oak Toad (*Bufo quercicus*), Barking Treefrog (*Hyla gratiosa*), and Eastern Spadefoot (*Scaphiopus holbrookii*). Roger also provided confirmation, a shell, of the state endangered Chicken Turtle (*Deirochelys reticularia*) in Virginia at Seashore State Park (now First Landing State Park) (Rageot, 1968).

Roger's first love in Virginia was the Great Dismal Swamp. During his 16-yr period with the Norfolk Museum, he spent many, many nights in the swamp with only a few blankets, sandwiches, and a few tins of food. He took notes on everything, not just amphibians and reptiles. His collections of animals ended up as stuffed display specimens in the museum's dioramas, scientific specimens in herpetological collections such as the Smithsonian Institution and other museums, and live animals in exhibits. His fieldwork in the Swamp was supported by small grants from the Virginia Academy of Science in 1953 and 1957.

Around 1960 Roger wrote a large manuscript based on his excursions and natural history observations in the Great Dismal Swamp in Virginia and North Carolina. He tried to get it published by as many as 10 book publishers but was apparently unable to make it happen. It was accompanied by 85 pen and ink drawings. Some of these drawings cannot now be located but some of those available will be published in two parts along with the manuscript "Land Unvanquished" in forthcoming issues of *Banisteria*. Roger loved the Dismal Swamp. His attraction to it was not only scientific but also spiritual and literary. He gained his inner strength just being there and being one with the swamp ecosystem.

OBITUARY: ROGER RAGEOT

Roger also wrote several very different articles and papers, from magazine articles on the supernatural to scientific papers on natural history. Although he had some training as a scientist, his approach to life and natural history was artistic. He saw and felt art in nature and some of his writing reflected this inner connection. All of the papers known to us are listed in the bibliography. It is not an extensive list, but it is quite varied and broad in scope. "The Apparition," a story in a 1963 issue of Fate Magazine (but not located by us), devoted to tales of the supernatural and unexplained, was part of a series of stories that Roger grouped into a collection called "Rageot's Horrors." We have unfortunately been unable to find this collection.

During his tenure in Norfolk while at the museum and in later years after returning from the tropics, Roger (Figure 3) appeared in numerous newspaper

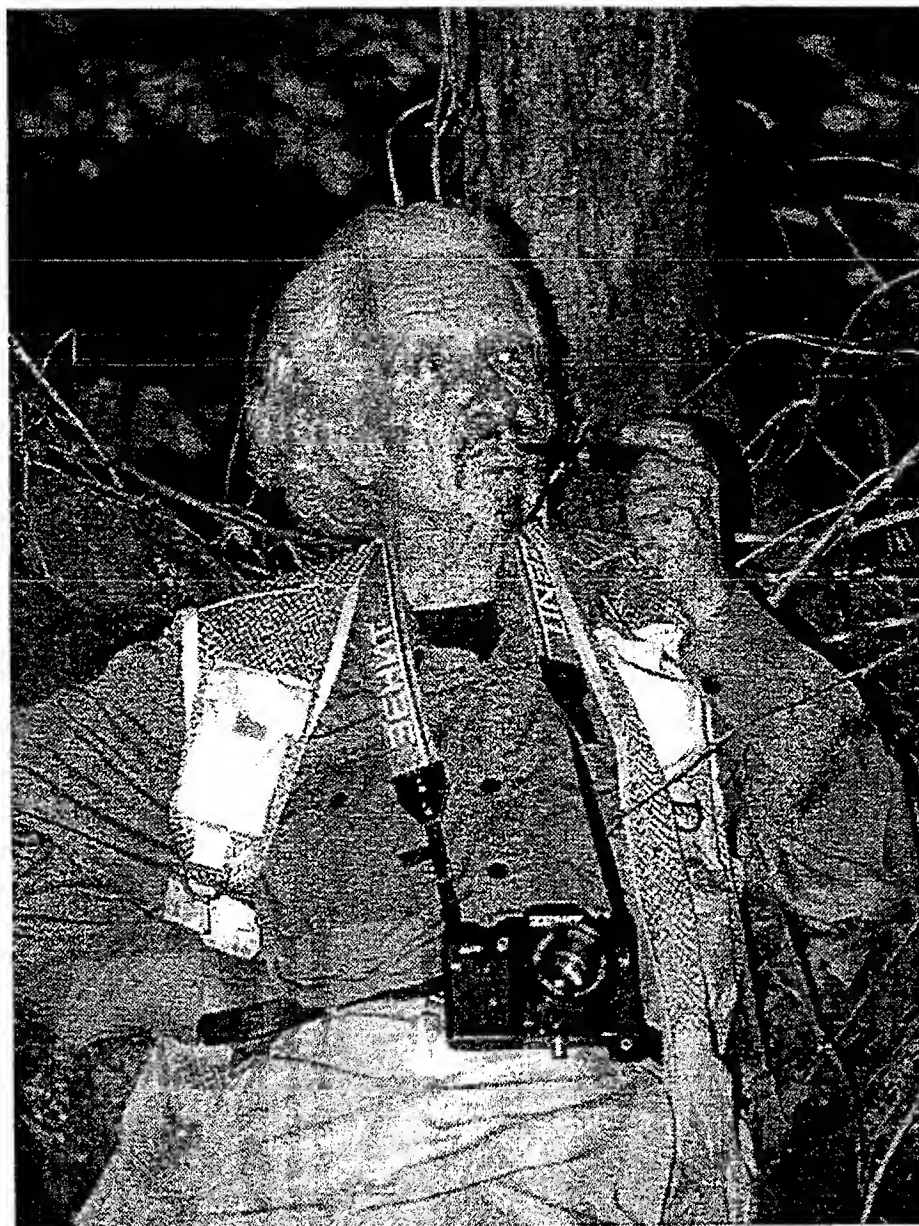


Figure 3. Roger Rageot at Jericho Ditch, Great Dismal Swamp National Wildlife Refuge, Virginia in September 2002. Photograph by David Liebman.

articles throughout the Tidewater area. He became something of a noted naturalist and was sought after for identification on many types of animals, fossils, and even some invertebrates. His eccentricities, like eating road kills and spending long periods of time in the Dismal Swamp by himself, were extolled in complementary fashion by at least two reporters late in life. And the announcement of his death was covered by one of them with a sort of reverence for his gifts to Tidewater natural history, education, and his unusual life style.

The late Joseph Campbell, noted philosopher and professor of comparative mythology, extolled the virtues and value of making one's way in life. "Follow your bliss" is his most well known phrase. Roger Rageot followed his bliss. He did what was right for him. And he did not care what other people thought about him. In the process, he gave far more than he received and he gave it with grace, humility, and dignity. He was fond of saying that he was a French count by heredity, a distinction disputed by his sister. But even if he was not really of royal descent, he surely acted that way. Virginia's natural history, especially herpetology, benefited from his service in the defunct Norfolk Museum of Natural History, public education, and his portrayal and love of the Great Dismal Swamp.

Papers and Articles Written by Roger H. de Rageot

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OBITUARY: ROGER RAGEOT

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Wood, J. T., and R. H. Rageot. 1963. The nesting of the many-lined salamander in the Dismal Swamp. Virginia Journal of Science 13: 121-125.

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President's Corner

Hello VHS members. I hope that this message finds you happy and herping. This herping season started off early for me. I started finding amphibians and painted turtles in early January. I even discovered Spotted Salamander egg masses on 28 January. This is a full month before the usual egg-laying event. Unfortunately, we had very cold weather after this, so many of the egg masses were lost. If next December is warm, then I will be able to say that I literally herped all year. I hope that you have had some interesting experiences as well.

I would like to use the majority of this space to advertise all of the upcoming events for the spring, summer, and fall of 2007. We have already had two events, one in April and one in May. The April event was called the Resource Ramble and was held at the Blue Ridge Scout Reservation in Pulaski County. Although we only had six people in attendance, we had an opportunity to explore some new habitat, add some new species to our life lists, and develop a preliminary list of species for the scout reservation. The second event was the Rock Creek Park BioBlitz in Washington, D.C. Members who attended did a great job organizing the herping groups and were able to collect 17 species in this inner city park. One of the species found had not been documented previously for the park.

If you missed these two events there are still two more that you can attend. Coming up on June 8-10 is the second annual Herp Blitz. This will be in Chesapeake, Virginia and promises to be a great event for frogs, snakes, and turtles. During this event we will survey Northwest River Park and the newly created wildlife management area called Cavalier Wildlife Management Area. On Friday we will set turtle and minnow traps and organize for Saturday's survey. Saturday will be a full day of surveying. On Sunday we will have a morning survey and wrap up the event by afternoon. The regular VHS spring/summer meeting will be held on July 6-8 at New Kent Conference Center and Chickahominy Wildlife Management Area. Rooms are available at the New Kent Conference Center for \$55 per room per night, or \$110 per room for two nights. To reserve a room please contact Susan Watson at susan.watson@dgif.virginia.gov or shwatson8888@yahoo.com or 804-367-1185 or 804-458-4584. Money for the room can be sent to Paul Sattler, VHS Secretary/Treasurer, Department of Biology, Liberty University, 1971 University Blvd., Lynchburg, VA 24502. Please make checks out to the VHS. The deadline to send this payment to Paul will be June 29, 2007 (one week before the event). At the time of writing this message there were only 10 rooms left, so please reserve your room soon.

July 29, 2007 is the date set for Reptile Day at the Virginia Museum of Natural History in Martinsville. The VHS is playing a major role at this event. We have already donated money and we will set up a display at the event. We need volunteers to interact with the public, to set up displays, and to build displays.

PRESIDENT'S CORNER

We plan to have many live animals for the public to view and hold. If you can volunteer, please see me at one of the upcoming events or email me. This is a great opportunity for us to educate the public about the reptiles and amphibians of Virginia.

The last thing that I have to announce is the fall VHS meeting and symposium which is set for October 20. The meeting will be held at Virginia Commonwealth University's Trani Life Sciences Building. VCU is located in Richmond and is a nice central location for almost all places in Virginia. Our host is Dr. Joy Ware. As usual, we are looking for presenters, audience members, and items for the auction. At this meeting we will be electing new officers who will serve for the next two years. We will also be discussing arrangements for the VHS 50th anniversary in 2008.

More information about everything listed above is on the VHS website. If you have any questions or concerns please contact me at frogman31@gmail.com or 434-724-9034. I would be happy to help you in any way.

Respectively submitted
Jason Gibson, VHS President

FUTURE EVENTS

June 8-10, 2007

Second Annual Herp Blitz
Northwest River Park, City of Chesapeake and
Cavalier Wildlife Management Area, City of Suffolk

July 6-8, 2007

VHS Spring/Summer Meeting and Survey
New Kent Conference Center, New Kent County
Chickahominy Wildlife Management Area, Charles City County

July 29, 2007

Reptile Day
Virginia Museum of Natural History, Martinsville

October 20, 2007

VHS Fall Meeting and Symposium
Virginia Commonwealth University, Richmond

Check the VHS newsletter and website (vaherpsociety.com) for details

Virginia Herpetological Society
Minutes of Meeting
October 21, 2006
Longwood University

The meeting was opened for business after various workshops and presentations had been offered throughout the day, with about 16 in attendance. The site(s) for the Spring Survey was discussed. Various areas suggested for surveying included the D.C. BioBlitz at Rock Creek on May 18-19. Jason has been in contact with the Park Service regarding permission to publish the results of surveys in which the VHS participates, and was awaiting their decision. The survey could be merged with a trip to the National Zoo and a possible visit behind the public areas. A second possibility was Northwest River Park in Chesapeake. The park would want a low key survey due to past adverse publicity regarding the venomous snakes which occur there. All three poisonous species native to Virginia occur in the Park. There are camping facilities available for lodging. Because the mosquitoes at this site are so numerous it would be beneficial to hold this survey early in the year. A third site mentioned was the International Paper property in Suffolk. Carpenter and Little Grass frogs should both occur at this site. The Goshen Pass area of Rockbridge was also mentioned. There is a Boy Scout camp which might be rented for lodging and facilities. Members were asked to email dates they could not attend a survey to Jason Gibson, who would try to set the date of at least two surveys.

There are two Reptile Festivals planned for the coming year. The Reptile Weekend is being held in Newport News at the Virginia Living Museum from February 17-19, 2007. Jason asked for a volunteer to help plan for this event, but no one stepped forward. There was discussion on whether the VHS should buy, build or borrow a flannel display board to prepare a display for public events, to publicize the activities of the Society. The Reptile Festival is being held in Martinsville at the Virginia Museum of Natural History on July 28, 2007. Jason said that he would take a lead role in organizing the Society's efforts for this event. We would want live animals, displays, and people to give talks or presentations, throughout the day. Please email Jason Gibson frogman31@gmail.com if you are interested in volunteering for the Martinsville Festival.

Jason then called for the Committee Reports. Pattie Crane reported that the VHS Store had obtained its \$34.95 start-up fees from Kory Steele. These funds were then generated from the revenues produced from sales and Kory had been repaid. There was an additional \$60.00 available for a renewal fee, generated from sales. Pattie asked if the \$60.00 should be used for the renewal and was told to go ahead. The treasury has received only \$4.85 in "profit" thus far, but the Store is young and just becoming known, and is not losing money.

last year. Send materials for the January Newsletter to Kory (colchicine@hotmail.com).

Jason asked for advice on appointing a new *Catesbeiana* editor, as Steve Roble has asked to be replaced after 2007. Jason hopes to have a candidate named by the Summer of 2007. Everyone agreed that Steve would be a very hard act to follow. The Executive Committee will review the possibilities and develop a plan to restructure the position so that the editor does not have to personally perform all of the editing. It is hoped that an editorial board can be generated to review manuscripts, so the editor will become more of a managing editor rather than a review editor. There was some discussion of whether it would be possible to merge the VHS with the Virginia Natural History Society and combine *Catesbeiana* with *Banisteria*.

Presentations at the Fall Meeting included: Mike Clifford *GPS Workshop*, Kory Steele and Bonnie Keller *Caring for Captive Amphibians and Reptiles*, Michael Dorcas *Effective Techniques for Field Studies of Amphibians and Reptiles*, Michael Dorcas (keynote presentation) *Impacts of Urbanization on Amphibians and Reptiles in the Carolinas*, J.D. Kleopfer *The History and Impacts of the Pet Turtle Trade*, Norman Reichenbach et al. *Chronological account of the Restoration Program for the State Endangered Plains Garter Snake in Ohio*, Joy Ware *The Role of Amphibians and Reptiles in Conservation Medicine*, Jennifer Heemeyer *Evaluation of Visible Implant Elastomer in Red-backed Salamanders*.

Respectively submitted
Paul Sattler, VHS Secretary/Treasurer

DUES REMINDER

Membership in the VHS is on a calendar year basis (expires annually on December 31). Please renew your membership for 2007 soon if you have not done so already. This will save our treasurer the time and expense needed to mail you a renewal notice. Delinquent members will be dropped from the society's mailing list in July. See the last page of this bulletin for the membership application/renewal form. Save postage by paying your dues at the Herp Blitz if you are planning to attend this exciting event.

FALL MEETING MINUTES

Paul Sattler reported that the Spring 2006 Minutes from the Douthat Spring Meeting had been published in *Catesbeiana* 26(2) along with the October 2006 Budget Report. Since that Budget Report was produced, the Treasury had paid out \$377 for *Catesbeiana* 26(2), \$280 for SSAR publications to be used for the Fall Auction, and a \$250 Honorarium. This brought the treasury from \$5630 down to \$4722. However, receipts from the Fall Auction and book and T-shirt sales were expected to replace these expenditures. Dues generated from 2007 membership renewals should further augment the checking account.

Steve Roble reported that 175 copies of *Catesbeiana* 26(2) were printed. It was a large volume with 60 pages. Steve still has some material left for the next issue, and several articles in the works, so the prospects for the next issue appear good at this time.

John White reported via email that there are more than 1,000 new visitors to the web page each month. While most are from the US, there are also visitors from the United Kingdom, Canada, Singapore, and India. A number of new documents have been added to the web page including VHS Grants in Herpetology and many of the feature articles from recent *Catesbeiana* issues. A web page has been created for each species, which will allow room for many more photographs and additional information. John requests that members email him (john.white161@verizon.net) photos (minimum 1024 x 700 pixels) of native herps including locality information for inclusion on the web page.

Tim Christensen is the new chair of the Conservation Committee, having recently been appointed by the President. He stated that he would like to have a conservation article, perhaps an opinion piece, in each Newsletter. Let Tim (mtnc066@msn.com) know if you would like to work on the Conservation Committee as he is looking for volunteers.

Joy Ware reported that the Research Committee was looking at ways to stimulate a higher level of research in the Society. They would like to initiate a survey somewhat similar to the annual bird counts that are quite popular. They will be working to develop a protocol for performing such individual surveys.

Jason asked for volunteers to chair the Education Committee. Mike Clifford had volunteered if no one else came forward, and was appointed when no one else did. If you are interested in serving on this committee, email Mike Clifford (micliff@VT.edu).

Kory Steele reported that the next Newsletter was due out in January 2007. Members seemed pleased with the new format and information provided this

**Virginia Herpetological Society
Treasurer's Report
May 2007**

Balance on Hand October 2006 \$5,629.97

Receipts:

Fall Live Auction	\$ 553.00
Fall Silent Auction	\$ 161.50
Book Sales (Snakes of the Southeast)	\$ 337.00
T-Shirt Sales	\$ 75.00
<i>Catesbeiana</i> Back Issue Sales	\$ 5.00
October Dues	\$ 263.00
November Dues	\$ 101.00
December Dues	\$ 220.00
January Dues	\$ 464.00
Donations	\$ 60.00
February Dues	\$ 185.00
March Dues	\$ 130.00
April Dues	\$ 30.00
May Dues	\$ 146.00

Total Receipts \$2,730.50

Disbursements:

<i>Catesbeiana</i> 26(2)	\$ 377.65
Fall Honoria	\$ 250.00
Fall Meeting Food	\$ 181.00
VA Museum of Natural History Reptile Weekend	\$ 250.00
VHS Grants in Herpetology	\$1,000.00
Web Site Registration	\$ 17.50

Total Disbursements \$2,076.15

Balance on Hand May 2007 \$6,284.32

Paul Sattler
VHS Secretary/Treasurer

BULLETIN INFORMATION

Catesbeiana is published twice a year by the Virginia Herpetological Society. Membership is open to all individuals interested in the study of amphibians and reptiles and includes a subscription to *Catesbeiana*, two newsletters, and admission to all meetings. Annual dues for regular membership are \$15.00 (see application form on last page for other membership categories). Payments received after September 1 of any given year will apply to membership for the following calendar year. Dues are payable to: Dr. Paul Sattler, VHS Secretary/Treasurer, Department of Biology, Liberty University, 1971 University Blvd., Lynchburg, VA 24502.

HERPETOLOGICAL ARTWORK

Herpetological artwork is welcomed for publication in *Catesbeiana*. If the artwork has been published elsewhere, we will need to obtain copyright before it can be used in an issue. We need drawings and encourage members to send us anything appropriate, especially their own work.

EDITORIAL POLICY

The principal function of *Catesbeiana* is to publish observations and original research about Virginia herpetology. Rarely will articles be reprinted in *Catesbeiana* after they have been published elsewhere. All correspondence relative to the suitability of manuscripts or other editorial matters should be directed to Dr. Steven M. Roble, Editor, *Catesbeiana*, Virginia Department of Conservation and Recreation, Division of Natural Heritage, 217 Governor Street, Richmond, VA 23219.

Major Papers

Manuscripts submitted for publication should be typewritten (double-spaced) on good quality 8½ by 11 inch paper, with adequate margins. Consult the style of articles in this issue for additional information, including the appropriate format for literature citations. The metric system should be used for reporting all types of measurement data. Computer diskettes (Word or WordPerfect format) are desired for longer papers. Submissions concerning the herpetofauna of selected areas, such as a park, city or county, should be prepared in article rather than field note format. Articles will be refereed by the editor and one or more qualified reviewers. All changes must be approved by the author before publication; therefore, manuscripts must be received by the editor before **March 1** and **September 1** to be considered for publication in the spring and fall issue, respectively, of *Catesbeiana*. Reprints of articles are not available, but authors may reprint their own articles to meet professional needs.

(Editorial policy continued on inside back cover)

MEMBERSHIP APPLICATION

I wish to _____ initiate _____ renew membership in the Virginia Herpetological Society for the year _____ 2007 _____ 2008 _____ 2009.

Name _____

Address _____

_____ Phone _____

email address: _____

Dues Category: _____ Regular (\$15.00)
 _____ Family (\$20.00)
 _____ Under 18 (\$8.00)
 _____ Life (\$225.00)

Interests: _____ Amphibians _____ Reptiles
 _____ Distribution _____ Research
 _____ Captive Husbandry
 _____ Specifically _____

Make checks payable to the Virginia Herpetological Society and send to:
Dr. Paul Sattler, VHS Secretary/Treasurer, Department of Biology,
Liberty University, 1971 University Blvd., Lynchburg, VA 24502

Visit the VHS web site at: vaherpsociety.com

Dr. Steven M. Roble, Editor

Catesbeiana

Virginia Department of Conservation and Recreation

Division of Natural Heritage

217 Governor Street

Richmond, VA 23219