

Table 21 (continued).

FAMILY	SPECIES	GWMP		CHOH			GE
		GF	TR	CB	GF	PI	
Halictidae	<i>Lasioglossum (Dialictus) zephyrum</i> (Smith)			X			
	<i>Lasioglossum</i> sp. 1			X		X	
	<i>Lasioglossum</i> sp. 2			X			
	<i>Lasioglossum</i> sp. nr. <i>cattaleae</i>					X	
	<i>Lasioglossum</i> sp. nr. <i>oblongum</i>	X					
	<i>Sphecodes</i> sp.			X			
Megachilidae	<i>Anthidiellum (Loyolanthidium) notatum</i> (Latreille)	X					
	<i>Anthidium (Proanthidium) oblongatum</i> (Illiger)	X					
	<i>Coelioxys (Boreocoelioxys) sayi</i> Robertson	X					
	<i>Heriades (Neotrypetes) carinatus</i> Cresson	X					
	<i>Megachile (Chelostomoides) exilis</i> Cresson			X			
	<i>Megachile (Eutricharaea) rotundata</i> (Fabricius)			X			
	<i>Megachile (Litomegachile) brevis</i> Say			X			
	<i>Megachile (Litomegachile) mendica</i> Cresson			X	X	X	
<i>Osmia (Melanosmia) pumila</i> Cresson			X				

Amphibians and reptiles

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The Virginia Herpetological Society fielded a team to survey amphibians and reptiles during the BioBlitz. Eight sites were surveyed in both the GWMP (VA) and CHOH (MD), as described below. GPS readings (NAD83/ WGS84) were taken in the center of each site.

Great Falls Park, GWMP, VA

Site 1. Clay Pond. A small, semi-wooded pond with deep silty sediments. Many fallen logs provide basking sites for turtles. This pond is located in the northern portion of the Park. (18 304556E 4319334N)

Site 2. Trails by Patowmack Canal. This site consists of a series of trails paralleling the canal and the Potomac River. Beside the trail is a mature hardwood forest. At the end of the trail was a seepage area with a little standing water. (18 304600E 4319631N)

Site 3. Potomac River, northern portion. Three turtle traps were placed here. This portion of the river is braided with several side channels. (18 304678E 4319407N)

Site 4. Trails adjacent to Matildaville. This site consists of a small stream, trash pile, ruins of an old house, and a mature hardwood forest. (18 305018E 4318258N)

Turkey Run Park, GWMP, VA

Site 5. Trails and ephemeral stream. The portion of Turkey Run Park surveyed was the wooded debris piled around the bathrooms and park headquarters and a section of mature hardwood forest on the most eastern side of the park. (18 314047E 4314733N)

CHOH, MD

Site 6. Carroll Branch, small stream near Great Falls Tavern Visitor Center. This site contains a small stream in a mature hardwood forest. At the time of the survey the stream was rapidly rising due to the heavy rainstorms. The streambed is lined with cobble, sand, logs, and the sides were filled with leaf litter. (18 305542E 4319346N)

Site 7. Olmsted Island. This island was accessed via a wooded boardwalk and special permission was granted to our group to survey off the boardwalk. During flood periods parts of this island are submerged by the Potomac River. The island has few trees, but abundant grasses and other small herbaceous plants. Large granitic rock formations, some containing vernal pools, are visible all over the island. (18 305115E 4319140N)

Site 8. Bear Island. This large island, formed by a canal on the north and the Potomac River on the south, has many woodland ponds and vernal pools, as well as hardwood forests. Previously, disease surveys conducted on Bear Island revealed the presence of *Batrochytrium dendrobatidis* (chytrid fungus) and ranaviral infections (Mary Travaglini, DC/MD TNC, pers. comm.). Extra disinfection precautions were taken

when surveying this area. (18 306428E 4317111N)

Three types of parasites (leech, mite, and tick) were observed on a turtle (coordinator's note: none of these are included in the final species count for the BioBlitz) and some of the captured lizards. Bear Island (CHOH, MD) contained the greatest biodiversity of species, whereas Olmsted Island produced the fewest (Table 22). Only native species were found during the survey.

Table 22. Summary of the number of amphibians and reptiles observed at survey sites 1-8.

Site	1	2	3	4	5	6	7	8	Misc*
Amphibians									
<i>Acris crepitans</i> (Baird)				1					
<i>Anaxyrus americanus</i> (Holbrook)				3	2	2		1	
<i>Anaxyrus fowleri</i> (Hinckley)		7		1	3		1	10	
<i>Hyla chrysoscelis</i> (Cope)				1			2	2	
<i>Lithobates catesbeianus</i> (Shaw)	1							1	
<i>Lithobates clamitans</i> (Rafinesque)	1			2			1	3	
<i>Lithobates palustris</i> (LeConte)		2				1		1	
<i>Lithobates sylvaticus</i> (LeConte)					1			1	
<i>Pseudacris crucifer</i> (Wied-Neuwied)								2	
<i>Eurycea bislineata</i> (Green)				2		11			
<i>Notophthalmus viridescens</i> (Rafinesque)								12	
Reptiles									
<i>Chelydra serpentina</i> (Linnaeus)			1					2	
<i>Chrysemys picta</i> (Schneider)	7							3	
<i>Pseudemys rubriventris</i> (LeConte)								1	
<i>Terrapene carolina</i> (Linnaeus)				1					1M
<i>Plestiodon fasciatus</i> (Linnaeus)		4		3	1				
<i>Plestiodon laticeps</i> (Schneider)		1			1				
<i>Agkistrodon contortrix</i> (P. de Beauv.)		3						1	
<i>Carphophis amoenus</i> (Say)								2	
<i>Diadophis punctatus</i> (Linnaeus)		1		1	1				
<i>Heterodon platirhinos</i> (Latreille)									1W
<i>Nerodia sipedon</i> (Linnaeus)	1							1	
<i>Opheodrys aestivus</i> (Linnaeus)		1							
<i>Pantherophis alleghaniensis</i> (Holbrook)				1					
<i>Regina septemvittata</i> (Say)									1L
<i>Storeria dekayi</i> (Holbrook)	2	1		1					
<i>Thamnophis sirtalis</i> (Linnaeus)				2					
Totals	12	20	1	19	9	14	4	43	3

* Miscellaneous observations: M= MacArthur Blvd. on road; W = in canal at north end of Widewater canal; L = sidewalk of museum at Lock 20.

Annotated Checklist of Species Observed
at the 2006 Potomac Gorge BioBlitz

Class Amphibia

Order Anura

Family Bufonidae

Anaxyrus americanus (Holbrook) (Eastern American Toad) - [sites 4 (1 male, 1 female, 1 juvenile), 5 (2 females), 6 (2 adults), 8 (1)].

Anaxyrus fowleri (Hinckley) (Fowler's Toad) - [sites 2 (5 juveniles, 1 metamorph), 4 (1 dead), 5 (1 female, 2 juveniles), 7 (1 female), 8 (10 adults)]. The one adult female toad found at the entrance of Olmsted Island had a hind leg stripped to the bone. A total of ten adult toads were found foraging in the woods of Bear Island.

Family Hylidae

Acris crepitans (Baird) (Eastern Cricket Frog) - [site 4 (1 calling male)].

Hyla chrysoscelis (Cope) (Cope's Gray Treefrog) - [sites 4 (1 calling male), 7 (2 calling males), 8 (2 males, including 1 calling)].

Pseudacris crucifer (Wied-Neuwied) (Spring Peeper) - [site 8 (2 metamorphs)].

Family Ranidae

Lithobates catesbeianus (Shaw) (American Bullfrog) - [sites 1 (1 adult), 8 (1 tadpole)]. On Bear Island, where *Batrochytrium dendrobatidis* has been found, no adults or other age class frogs were captured. This fungal infection, which affects keratinized skin, does not affect tadpoles (Carey et al., 2003).

Lithobates clamitans (Rafinesque) (Green Frog) - [sites 1 (1 male), 4 (1 juvenile), 7 (1 male), 8 (3 adults)]. Capture sites included a woodland vernal pool, a pond, and the cattail margin of another pond.

Lithobates palustris (LeConte) (Pickerel Frog) - [sites 2 (2 adults), 6 (1 adult), 8 (1 young adult)].

Lithobates sylvaticus (LeConte) (Wood Frog) - [sites 5 (1 adult), 8 (1 metamorph)].

Order Caudata

Family Plethodontidae

Eurycea bislineata (Green) (Northern Two-lined Salamander) - [sites 4 (2 adults), 6 (13 adults)].

Family Salamandridae

Notophthalmus viridescens (Rafinesque) (Red-spotted Newt) - [site 8 (12 adults)]. These animals were found by dipnetting in woodland ponds on Bear Island.

Class Reptilia

Order Testudines

Family Chelydridae

Chelydra serpentina (Linnaeus) (Snapping Turtle) - [sites 3 (1 adult), 8 (1 adult, 1 juvenile)]. One Snapping Turtle was captured in a baited hoop turtle trap set in the Potomac River. Numerous leeches were found attached to its skin. A fishhook lodged on a front foreleg was removed with pliers. A large adult Snapping Turtle was observed swimming in the Potomac River at Bear Island and a juvenile was dipnetted in a pond on the island.

Family Emydidae

Chrysemys picta (Schneider) (Painted Turtle) - [sites 1 (5 males, 2 females), 8 (3 adults)]. Painted Turtles were captured in Clay Pond using turtle traps, while those on Bear Island were observed swimming in ponds and the canal.

Pseudemys rubriventris (LeConte) (Northern Red-bellied Cooter) - [site 8(1)]. One juvenile was dipnetted in the canal bordering Bear Island. Algae collected from the shell of this turtle were submitted to the algae team, which identified the species as *Basicleadia chelonum* (Collins) Hoffman.

Terrapene carolina (Linnaeus) (Box Turtle) - [site 4 (1 male)]. A male Box Turtle was found foraging in the woods at site 4. A female Box Turtle that was found crossing MacArthur Boulevard was removed the road.

Order Squamata

Family Scincidae

Plestiodon fasciatus (Linnaeus) (Five-lined Skink) - [sites 2 (3), 4 (2 females, 1 juvenile), 5 (1)]. Six Five-lined Skinks were collected during the survey period. They were found on downed trees, debris piles, and the rocky ruins of an old house. The juvenile skink was found in an old canal lock and was parasitized by mites and one tick. Another skink that was on a tree was also infested with ticks and mites.

Plestiodon laticeps (Schneider) (Broad-headed Skink) - [sites 2 (1 male), 5 (1 male)]. One skink was found on an old log and another mite-infested individual was captured on a woodpile.

Suborder Serpentes

Family Colubridae

Carphophis amoenus (Say) (Eastern Worm Snake) - [site 8 (2)]. Two adult worm snakes were found under logs near a pond on Bear Island.

Diadophis punctatus (Linnaeus) (Ring-necked Snake) – [sites 2 (1), 4 (1 juvenile), 5 (1 adult)]. All three Ring-necked Snakes were found under cover objects (logs, landscaping timbers) at park headquarters.

Heterodon platirhinos (Latreille) (Eastern Hog-nosed Snake). One melanistic adult Eastern Hog-nosed Snake was reported by another survey group, which found it swimming along the rocks in the canal at the north end of Widewater in the Great Falls section of Maryland. Upon capture it went through the stereotypical sequence of hissing loudly and flattening its head.

Nerodia sipedon (Linnaeus) (Northern Water Snake) – [sites 1 (1 basking adult), 8 (1 juvenile)].

Opheodrys aestivus (Linnaeus) (Rough Green Snake) – [site 2 (1)]. One juvenile green snake was captured as it moved in grass in a wet seep along the trail.

Pantherophis alleghaniensis (Holbrook) (Eastern Rat Snake) – [site 4(1)]. One adult Eastern Rat Snake was captured on the road below the guardhouse adjacent to site 4.

Regina septemvittata (Say) (Queen Snake). One adult Queen Snake was found on the sidewalk of the museum at lock 20.

Storeria dekayi (Holbrook) (Brown Snake) – [sites 1 (2 adults), 2 (1 adult), 4 (1 juvenile)]. Three individuals were found under logs and the other was under a brush pile.

Thamnophis sirtalis (Linnaeus) (Garter Snake) – [site 4 (2 adults)]. Two adults were found under a brush pile and a stump, respectively.

Family Viperidae

Agkistrodon contortrix (Palisot de Beauvois) (Copperhead) (Fig. 15) – [sites 2 (3 adults), 8 (2 juveniles)]. One Copperhead was coiled in leaves in woods beside a main walking path, another was found under a log, and a third was discovered under a brush pile. One of these animals was missing a tail tip. A juvenile was found under a log in the woods.

A checklist of all species of amphibians and reptiles reported from the Potomac Gorge compared with the species encountered during the BioBlitz is presented in Table 23. Although fourteen species of salamanders are known for this area (Cohn, 2005), only two were observed during the BioBlitz.

Discussion. Hot and dry conditions just prior to and on the first day of the survey period may have contributed to the paucity of salamander species found.

The BioBlitz was punctuated by a thunderstorm followed by heavy rain showers on the evening of 24 June through the next morning (Fig. 16). Despite these heavy rains, none of the explosive breeding anurans (e.g., spadefoots) were seen or heard. Other species of amphibians, particularly spring-breeding anurans, had probably completed breeding and were unlikely to be found easily during a June survey.



Fig. 15. An adult copperhead (*Agkistrodon contortrix*) found during the Potomac Gorge BioBlitz. ©2006, Roy Sewall.

Table 23. Checklist of Amphibians and Reptiles of the Potomac Gorge¹.

	<u>Abundance</u> ²	<u>BioBlitz</u>		<u>Abundance</u> ²	<u>BioBlitz</u>
Frogs/toads					
<i>Acris crepitans</i>	A	X	<i>Kinosternon subrubrum</i>	C	
<i>Anaxyrus americanus</i>	C	X	<i>Pseudemys concinna</i>	U	
<i>Anaxyrus fowleri</i>	A	X	<i>Pseudemys rubriventris</i>	U	X
<i>Hyla chrysoscelis</i>	C	X	<i>Sternotherus odoratus</i>	C	
<i>Lithobates catesbeianus</i>	C	X	<i>Terrapene carolina</i>	A	X
<i>Lithobates clamitans</i>	A	X	Lizards		
<i>Lithobates palustris</i>	C	X	<i>Aspidoscelis sexlineata</i>	U	
<i>Lithobates sphenoccephalus</i>	C		<i>Plestiodon fasciatus</i>	C	X
<i>Lithobates sylvaticus</i>	C	X	<i>Plestiodon laticeps</i>	U	X
<i>Pseudacris crucifer</i>	A	X	<i>Sceloporus undulatus</i>	C	
<i>Pseudacris feriarum</i>	A		<i>Scincella lateralis</i>	U	
<i>Scaphiopus holbrookii</i>	R				
Salamanders			Snakes		
<i>Ambystoma jeffersonianum</i>	R		<i>Agkistrodon contortrix</i>	C	X
<i>Ambystoma maculatum</i>	C		<i>Carphophis amoenus</i>	C	X
<i>Ambystoma opacum</i>	C		<i>Cemophora coccinea</i>	R	
<i>Desmognathus fuscus</i>	A		<i>Coluber constrictor</i>	C	
<i>Eurycea bislineata</i>	C	X	<i>Diadophis punctatus</i>	C	X
<i>Eurycea guttolineata</i>	R		<i>Heterodon platirhinos</i>	U	X
<i>Eurycea longicauda</i>	U		<i>Lampropeltis calligaster</i>	U	
<i>Hemidactylium scutatum</i>	U		<i>Lampropeltis getula</i>	U	
<i>Notophthalmus viridescens</i>	C	X	<i>Lampropeltis triangulum</i>	U	
<i>Plethodon cinereus</i>	C		<i>Nerodia sipedon</i>	A	X
<i>Plethodon cylindraceus</i>	U		<i>Opheodrys aestivus</i>	C	X
<i>Pseudotriton montanus</i>	U		<i>Pantherophis alleghaniensis</i>	C	X
<i>Pseudotriton ruber</i>	A		<i>Pantherophis guttatus</i>	R	
			<i>Regina septemvittata</i>	U	X
Turtles			<i>Storeria dekayi</i>	U	X
<i>Chelydra serpentina</i>	C	X	<i>Storeria occipitomaculata</i>	U	
<i>Chrysemys picta</i>	A	X	<i>Thamnophis sauritus</i>	U	
<i>Clemmys guttata</i>	C		<i>Thamnophis sirtalis</i>	C	X
<i>Glyptemys insculpta</i>	R		<i>Virginia valeriae</i>	U	

¹Source: <http://beta2.c-t-g.com/gorge/nature/fauna.html>

²A = Abundant, C = Common, U = Uncommon, R = Rare.

Table 24. Survey effort per site by the amphibian and reptile team.

Survey Effort	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8
Number of hoop net sets	4	-	3	-	-	-	-	-
Number of surveyors	16	16	-	15	16	18	18	14
Hours surveyed	1	1.45	-	1.15	1.2	0.5	0.5	3
Man hours of survey effort	16	23.2		17.25	19.2	9	9	42



Fig. 16. Heavy rains on Saturday night and Sunday brought torrential waters to the Potomac Gorge, but not enough to deter a bit of Sunday morning field work by the amphibian and reptile team.

The survey yielded 27 species and 125 individuals representing 11 species of amphibians (nine anurans and two salamanders) and 16 species of reptiles (four turtles, two lizards, and 10 snakes) (Table 22). None of these species has a rare global or state status and no new county records were documented.

The members of the amphibian and reptile team were Jason Gibson (team leader), Paul Sattler, Emily Cole, Pattie Crane, Janet Eastridge, Rosemary Frezza, John Kleopfer, Heather Labelle-Spillman, Chris Risch, David and Wesley Van Gelder, John, Amy, Cherise, and Jennifer White, and Eric Wright. A summary of survey effort per site is given in Table 24. The team contributed a combined total of nearly 136 hours, including field work, travel time, specimen identification, and report writing (Table 25).

Final Species Count

In spite of torrential rains that cut the 30-hour survey nearly in half, 140 scientists, naturalists, students, and volunteers in 18 teams still managed to find and identify 1,232 species. They contributed a total of 2,322 hours (Table 25) before, during, and after the event to collect, prepare, and identify thousands of specimens from mostly historically undersurveyed taxonomic groups from NPS lands in the Potomac Gorge.

Table 25. Survey effort and results of the 2006 Potomac Gorge BioBlitz held 23-25 June 2006 at GWMP and CHOH.

TAXONOMIC GROUP	SURVEY TEAM*	TOTAL HOURS	TOTAL SPECIES
Green algae	7	170	68
Slime molds, fungi	9	13	60
Mosses, liverworts	6	240	21
Botany	4	32	38
Flatworms	1	13	4
Land snails, mussels	8	70	37
Isopods, amphipods	2	24	6
Crayfishes, copepods	8	No data	24
Spiders and kin	7	136	45
Dragonflies, damselflies	18	267	46
Mayflies, stoneflies, caddisflies, neuropterans	4	104	58
True bugs	2	46	55
Beetles	8	361	302
Scorpionflies	2	30	1
Flies	18	332	190
Moths, butterflies	15	230	185
Ants, bees	9	88	65
Amphibians, reptiles	16	136	27
TOTALS	140**	2322	1232

*Number of surveyors and identifiers per team.

**Four surveyors served on two teams and are not counted twice.

DISCUSSION

Results and Significant Finds

Despite inclement weather on the evening of 24 June and all day 25 June, the 2006 Potomac Gorge BioBlitz generated records of 1,232 species, mostly insects and other invertebrates. This number might have reached 1,500 to 2,000 species if weather conditions had been more favorable to allow field survey efforts to continue throughout most of the 30-hour period, and if there had been additional invertebrate survey teams focused on other orders of insects.

The BioBlitz yielded many surprising and exciting new finds, including dozens of new species records for Maryland, Virginia, and the two national parks. For example, the green algae team alone generated 68 new species records for Great Falls Park (GWMP, VA) simply because this group of organisms had never been documented in the Potomac Gorge.

The most significant collections of historically known species of plants were of wavy grass *Deschampsia flexuosa* (Linnaeus) Trin., and sweet birch, *Betula lenta* Linnaeus, which were last documented near Great Falls, VA, in 1879 and 1884, respectively. *Deschampsia flexuosa* is not known elsewhere in the Potomac Gorge, whereas *B. lenta* is rare in the upper part of the Gorge, upstream of Bullneck Run. Both species were collected on a steep, rocky, river-fronting bluff just upstream from the mouth of Difficult Run. Another interesting collection was that of black maple, *Acer nigrum* Michx., which is primarily distributed in limestone areas of the Central Appalachian Ridge and Valley province. This tree is found only occasionally east of the mountains in the Potomac River Valley, also occurring upstream at Balls Bluff Regional Park (Loudoun Co.) and Riverbend Park (Fairfax Co.). Also noteworthy is *Elymus macgregorii*, a recently described species of wildrye (Brooks & Campbell, 2000), which flowers and fruits 4-6 weeks earlier than its congeners riverbank wildrye (*E. riparius* Wiegand), hairy wildrye (*E. villosus* Muhl. ex Willd.), and Virginia wildrye (*E. virginicus* Linnaeus). Long thought to be a form of the latter, *E. macgregorii* is now considered distinct and known to be abundant in many forested floodplains of the Gorge.

Two rare snails, *Punctum smithi* Morrison and the slender walker snail, *Pomatiopsis lapidaria* Say, were found. Two less desirable finds included the exotic virile crayfish (*Orconectes virilis*), an aggressive competitor with native crayfish, as well as *Arion*

hortensis (Ferussaci), a non-native European slug.

The dragonfly and damselfly survey produced two new species records for the Gorge, the lilypad forktail (*Ischnura kellicotti* Williamson) and Needhams's skimmer (*Libellula needhami* Wesfall). In addition, the double-striped bluet (*Enallagma basidens* Calvert) and *Ischnura kellicotti* have ranges that are expanding quickly and have moved into the region just in the past few decades.

Nine new state records were recorded by the true bug team for both Maryland and Virginia. Four species, three Miridae and one Tingidae, represent new state records for Maryland. Five species, one Anthocoridae and four Miridae, represent new state records for Virginia. The exotic anthocorid *Amphiareus obscuriceps* (Poppius) represents a new Western Hemisphere record and is being reported from a number of states (Henry et al., 2008).

The beetle team collected 19 new state records for Virginia including *Acalles carinatus* LeConte, *Acoptus suturalis* LeConte, *Anthonomus suturalis* LeConte, *Cophes obtensus* (Herbst), *Cryptorhynchus tristis* LeConte, *Listronotus humilis* Gyllenhal (Curculionidae); *Aeolus scutellatus* (Schaeffer), *Neopristilophus aethiops* (Herbst) (Elateridae); *Dirrhagofarsus lewisi* (Fleutiaux), *Stethon pectorosus* LeConte (Eucnemidae); *Melanophthalma distinguenda* Comolli (Latridiidae); *Orchesia ovata* Laliberte (Melandryidae); *Glipa hilaris* (Say), *Mordellistena ornata* (Melsheimer), *Pseudotolida lutea* (Melsheimer) (Mordellidae); *Cathartosilvanus imbellis* (LeConte) (Silvanidae); *Strongylium crenatum* Malkin, *Uloma mentalis* Horn (Tenebrionidae); and *Eucicantes marginalis* (Melsheimer) (Zopheridae). None of these represents a significant range extension since nearly all were recorded previously in Maryland and Washington, DC.

The fly team collected a specimen of *Scatophila carinata* Sturtevant, a species that had not been recorded east of Iowa. They also collected five species that are apparently new to science. Although some of these species had been collected in the region previously, at least one of them, *Hydrellia* sp., is known primarily from specimens collected during the BioBlitz.

The bee *Anthidiellum notatum* (Latreille) appears to be a new record for Virginia (Ascher, unpublished). Both this species and *Heriades carinatus* Cresson are uncommon and characteristic of dry, open habitats. Additional records of uncommon bee species are expected in the region with more intensive sampling throughout the year, particularly in the open rocky areas along the river.

Lessons Learned

Logistics. BioBlitzes require extensive planning and advanced preparation to run smoothly. Because the Potomac Gorge BioBlitz took place in a major metropolitan region within two separate national parks, it required a significant amount of time and effort to plan and execute. The technical coordinator of the Potomac Gorge BioBlitz and the staffs of TNC and NPS worked together for more than a year prior to the event to facilitate access to park lands, apply for scientific collecting permits for two national parks and one state, arrange housing for 140 volunteer researchers during the event that included adequate facilities for the initial preparation and identification of specimens, feed 180 volunteers (including support staff) for two days, and organize the repatriation of voucher specimens to the NPS. This last task required more than 20 months after the BioBlitz to accession specimens and finalize data entry, including the full-time efforts of an NPS intern for six months.

Another practical lesson learned is the importance of advanced planning for a rain or shine event. Weather conditions can affect the research effort by limiting the survey period, making specimens more difficult to find and collect, and significantly reducing the amount of data gathered. Inclement weather also affects logistical planning, such as housing for researchers, as well as outdoor food preparation and educational programs. Fortunately for the participants of the Potomac Gorge BioBlitz, the facilities at Glen Echo Park, Maryland, were selected with bad weather in mind.

Technical issues. Several team leaders noted the limitations of the BioBlitz format itself. It has been long observed that these events are only seasonal “snapshots” of a particular habitat or region and can never be a meaningful substitute for carefully planned, long-term field studies. Nevertheless, for NPS lands lacking the basic data concerning their biota, the sudden infusion of species lists, even with minimal ecological data, can help to identify species in need of immediate further study or conservation management.

Furthermore, the format of most BioBlitzes, including the Potomac Gorge BioBlitz, is intended to serve two purposes simultaneously, science and public education. BioBlitzes provide an important opportunity for students and citizen scientists to meet researchers and work with them in the field to learn basic collection, preparation, and identification techniques. Many scientists who participated in the Potomac Gorge BioBlitz relished the opportunity to meet with and share their expertise with the public, especially students (Fig. 17). However, enthusiastic and well-meaning

volunteers have a broad range of knowledge and experience and often require considerable training and supervision by scientists. Consequently, some team leaders and other scientists were unable to dedicate as much of their time as desired during the event to their field surveys and species identifications.

Another challenge that is unique to all BioBlitzes held on NPS lands, including the Potomac Gorge BioBlitz, involves voucher disposition. Bona fide researchers associated with universities and museums have no qualms whatsoever in depositing a synoptic collection of voucher specimens with NPS facilities. However, insistence by NPS-permitting authorities that ALL vouchers, including type specimens, be deposited in NPS collections remains a serious impediment to recruiting specialists and their institutions to participate in such events. The arguments on each side of the issue are well known to NPS staff, museum researchers, and other scientists, and will not be repeated here. Until the NPS and the major research institutions in the United States reach a mutually acceptable agreement, both the NPS and science will continue to suffer due to the lack of researchers willing to conduct research of any kind on NPS lands.



Fig. 17. Many scientists participating in the Potomac Gorge BioBlitz relished the opportunity to meet with and share their expertise with the public, especially students. ©2006, Mark Godfrey.

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The breadth and depth of data gathered during any BioBlitz is dependent upon the dedication of scientists who share their expertise, enthusiasm, and limited field time to launch an intensive biological survey. They are charged with recruiting and training volunteers with a wide range of field and taxonomic experience, choosing and implementing select field methods that will reveal the greatest diversity of their target organisms, and overseeing the gathering and recording of data.

The team leaders of the 2006 Potomac Gorge BioBlitz were the backbone of the event and brought to bear a depth of taxonomic understanding and field experience that spanned four kingdoms. These talented and dedicated researchers were Barbara Abraham, Scott Bates, Lance Biechele, John Brown, Sam Droege, Arthur Evans, Daniel Feller, Gary Fleming, Oliver Flint, Jason Gibson, John Hall, Zachary Loughman, Joshua Jones, Wayne Mathis, Arnold Norden, Richard Orr, and DorothyBelle Poli.

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The staff of the MD/DC Chapter of The Nature Conservancy (TNC) went beyond the call of duty to make the event both a scientific and educational success. Logistical Czarina Mary “The Wedding Planner” Travaglini and the rest of the Conservancy’s cadre of dedicated staff and volunteers helped to turn several rooms of an old amusement park into a highly functional base camp with comfortable and spacious quarters for working and sleeping. They ensured that the BioBlitz participants lacked nothing and provided plenty of cold drinks, fruit, snacks, and hearty meals for dining in or packing out into the field. Mary’s hard work, meticulous planning, and constant good cheer helped to keep everyone’s spirits high in spite of the oppressive heat and torrential downpours. And she helped to keep the final report on track throughout much of 2007 and 2008.

TNC media relations specialist David Dadurka did an impressive job of disseminating information about the BioBlitz. It was his enthusiasm for the project and media savvy that resulted in the great coverage for the event. BioBlitz educational coordinator Amy Hastie marshaled an impressive array of exhibitors and environmental educators to create an engaging public education program that brought home the diversity of the Potomac Gorge to all of the BioBlitz visitors. TNC writer Danny White joined some of the field survey teams and documented his experience with a “Postcard from the Field,” bringing the BioBlitz experience to a broader group of world wide web observers than could have participated in the event. TNC photographer Mark Godfrey helped document some of the team’s exploits and findings, as well as the overall dynamics at the Glen Echo Park base camp.

The Glen Echo Park Partnership for Arts and Culture, including Mary Boeckman, Paul Squire, and Dwain Winters, not only provided tremendous logistical support for the base camp, but also greatly facilitated operations of the public education tent.

Photographers Mark Godfrey and Roy Sewall generously allowed the use of their wonderful photos to illustrate portions of this report. Their images of habitats, organisms, people, and the interactions thereof help to capture and preserve the very essence of the BioBlitz.

Journalists Elizabeth Williamson (*Washington Post*), Dan Ferber (*Nature Conservancy* magazine), and Susan Milius (*Science News*) joined several of the survey teams in the field and later in the base camp to better understand the phenomena of the Potomac Gorge BioBlitz. They conducted numerous interviews with team leaders and volunteer surveyors to learn what motivated a wonderfully eclectic group of people to participate in such an event. These journalists ably articulated the sights, sounds, smells, and motivations that drive such an event to their respective readerships. Their insights and efforts to accurately portray the event to the public were much appreciated by all of the participants.

A core of committed National Park Service staff representing the two Potomac Gorge Parks (GWMP, VA and CHOH, MD) and the National Capital Region Center for Urban Ecology worked behind the scenes and contributed their vast collective knowledge of the region to support the BioBlitz planning effort. Their assistance ranged from providing information on previously documented flora and fauna in the parks, aligning the activities of the BioBlitz with NPS policies and procedures, developing data management systems to track the survey results, and offering critical information on park safety and accessibility.

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Nature educators and entertainers Martin and Chris Kratt travelled from Vermont to emcee the BioBlitz closing ceremony. These well-known television nature program personalities shared their love of all things wild with the BioBlitz volunteers and members of the public who braved the day's inclement weather to participate in the closing ceremony and learn the preliminary species count.

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final report in her possession simultaneously and had the onerous task of resolving a myriad of discrepancies. The accuracy of this report is due in large part to her meticulous efforts and dedication.

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Miscellanea

Reports

1. President's Report

This will be my last note as President of the Virginia Natural History Society and several accomplishments were made these past two years. The Society held a well-attended 80th birthday party in September 2007 in honor of Dr. Richard Hoffman and his extraordinary career. Steve Roble and Joe Mitchell are editing a *Festschrift* to be published in book form; an estimated 40 contributors have submitted 31 manuscripts. Membership has remained stable at 133 members. Plans are under way for the Society's Symposium entitled **Historical Explorations into Virginia's Natural History** to be held on September 26, 2009, at the Virginia Museum of Natural History in Martinsville (see notice about the symposium in the Announcements section). *Banisteria* has been accepted by **AGRICOLA**, a major indexing data base service for peer-reviewed biology journals. This will allow many more people to become aware of *Banisteria* and make it a more desirable journal in which to publish. Searchable pdf files of every paper in *Banisteria* are being added to the website. The issue you are holding in your hands is the first issue of *Banisteria* to have color photographs. I want to thank Art Evans for the monumental task of coordinating and conducting the Potomac Gorge BioBlitz, and submitting the data collected for publication in *Banisteria*. I want to thank all of the members of the Society's Executive Committee for their support and dedication to the Society during the past two years. It has been an honor serving as your president. I know the Society will be in good hands under the leadership of Dr. Barry Knisley, our next President.

The Society is still accepting entries for our logo contest. This logo will be used in future publications, events, and possibly items for sale to give our society better recognition. A **\$100 cash prize** will be given to the winning logo as selected by the Executive Committee. The words "Virginia Natural History Society" or the initials "VNHS" must appear in the logo. The winning artist must agree to transfer ownership and copyright of the logo to the Virginia Natural History Society. For more information and to submit entries contact: vhs.webmaster@verizon.net.

If you have a new email address or need to update your address please send me an email. The society is trying to update our email database so that we can communicate better with our members.

Consider submitting a manuscript to *Banisteria* for publication. There are no printing charges for members. Also, get one or more of your fellow naturalists to join the Virginia Natural History Society.

Tom McAvoy, (tmcavoy@vt.edu) President
Virginia Natural History Society

2. Minutes of December 2008 Council Meeting

The 2008 meeting of the Council of the Virginia Natural History Society was held in Settle Hall, Hampden-Sydney College, Hampden-Sydney, Virginia, on December 6th, 2008. In attendance were Tom McAvoy, Bill Shear, Barry Knisley, Richard Hoffman, Michael Lachance, Steve Roble, Michael Kosztarab, Art Evans, and Janet Reid. Joe Mitchell attended via telephone. The meeting was called to order by President Tom McAvoy at 1:05 PM.

The minutes of the 2007 meeting and the report of the Secretary-Treasurer were approved unanimously. Membership presently stands at 133 (19 institutional members), and the treasury contains \$8,787.42. The Secretary noted that due to an error by a temporary secretary, the current issue of *Banisteria* was sent to some members who had not paid dues; however, this evidently served as a reminder, and all but one of those members remitted their dues. The Secretary agreed to compare recent old membership lists with the current one and send invitations to past members to rejoin the society.

Some discussion followed on ways of increasing membership, but no concrete actions were taken beyond agreeing to provide brochures as needed for various events.

Steve Roble reported on progress on the Hoffman *Festschrift*. He noted that Richard recently turned 81 and that the volume has still not been published. He estimated that about 40 contributors have submitted about 700 manuscript pages and about 300 illustrations. He anticipated having at least the majority of this material to the museum press for formatting in a week or two. There followed some discussion on a possible financial contribution toward the publication from the Society, but it was concluded that the publication of the volume and its sale was the business of the Virginia Museum of Natural History, and that the Society would not volunteer any financial aid.

Steve received a round of applause from the council for his work on the volume and on *Banisteria*.

The Potomac Gorge BioBlitz will be published in the next issue of *Banisteria*. Art Evans reported that the revised manuscript would be in Steve's hands in about a week, and the printed size of the issue should be about 100 pages. The question of color in the issue was raised, and the Council asked Steve to explore the costs. There was then considerable discussion of the contents of future issues. Richard Hoffman opined that in the interests of bringing issues current again, there would be no shame in a 48-page or even a 28-page issue. The Secretary reminded the Council that having the publication of *Banisteria* uncoupled from annual dues presented record-keeping problems. Michael Lachance asked about the publication in *Banisteria* of original art work. Tom McAvoy stated that such work should be submitted to the standing Society President. It was also agreed to appropriate \$300 to pay one of Tom's students to text-scan past issues of *Banisteria*, so that pdf copies could be made for posting on the website.

The ballot for 2009 will go out as a separate mailing to members. The mailing will also include a dues renewal notice, and a reminder that the second issue of *Banisteria* for the year is on the way. The mailing will also solicit e-mail addresses. Bill Shear will be a candidate for Secretary-Treasurer; he is presently acting in an appointed capacity. Presently no candidate is standing for Vice President, a crucial point since the Vice President automatically becomes President at the end of his term. The candidates running for Councilor are: Ralph Eckerlin, Ollie Flint, and Duncan Porter. Some of the present candidates for Councilor will be contacted by Barry Knisley to see if they might be willing to be nominated for Vice President instead.

The upcoming symposium on the history of natural history in Virginia was discussed. The venue will be the Virginia Museum of Natural History in Martinsville; the date will be September 26th, 2009. Joe Mitchell agreed to explore the possibility of getting Dr. Dan Roberts of the University of Richmond as a keynote speaker. It was decided to have an informal reception at the Museum on the evening of September 25th. Lunch will be catered at the option of the attendees, and there will be an evening banquet on September 26th. Bill Shear agreed to handle the advance registration from Hampden-Sydney; the registration materials will be posted on the website. There was substantial discussion on the matter of costs and of how much time to allow speakers. Tom agreed to explore costs and sponsorships and get back to the Council with that information. It was agreed that 20 minutes per talk was the maximum that could be allowed. The proceedings of the symposium will be published as a book. Richard will approach Jerry McDonald about the publication and marketing of the volume by his company.

The meeting was adjourned at 3:55 PM.

Respectfully submitted,
Bill Shear, Secretary/Treasurer

3. Webmaster's Report

Several additional articles were added from a past issue of *Banisteria*. The website's user interface and page format were changed. The chart below represents website traffic from June through November of 2008.

Month	Page Loads	Unique Visitors	First Time Visitors	Returning Visitors
Nov 2008	60	42	37	5
Oct 2008	210	74	54	20
Sep 2008	27	25	22	3
Aug 2008	44	32	29	3
Jul 2008	44	33	29	4
Jun 2008	45	33	30	3
Total	430	239	201	38
Average/month	72	40	34	6

DEFINITIONS:

Page Loads - The number of times the front page of the VNHS website has been visited.

Unique Visitors - Total of returning and first time visitors.

First Time Visitors - A person who is considered to be a first time visitor (i.e., has no cookie) to the VNHS website.

Returning Visitors - A person who is returning to our website for another visit an hour or more later.

Location of recent VNHS visitors:



We would like to thank the Conservation Management Institute (www.cmiweb.org) for hosting the VNHS website.

Respectfully submitted,
John White, VNHS Webmaster

4. Editor's Report

This issue of *Banisteria* is devoted to the 2006 Potomac Gorge BioBlitz, which was attended by many members of the society. I thank Art Evans, the BioBlitz coordinator, for his extraordinary efforts to organize, conduct, compile, and summarize the survey. Mary Travaglini of the Maryland/DC Chapter of The Nature Conservancy (TNC) provided the cover photo and site map, and facilitated the procurement and transfer of funds from TNC and the National Park Service to VNHS to defray the publication costs of the journal. These funds also allowed us to include color photos for the first time. I hope that we can continue this trend in future issues. I thank my associate editors for serving as peer reviewers of the BioBlitz report.

After more than a year of solid effort, final editing of 31 manuscripts, prepared by 40 authors from four continents, for the *Festschrift* volume honoring Richard Hoffman's 80th birthday and outstanding career has been completed and final formatting and layout by the publications staff of the Virginia Museum of Natural History can commence. The papers cover a wide variety of taxonomic groups reflective of Richard's broad interests in natural history, and include descriptions of more than 25 new species. I thank Joe Mitchell for serving as my coeditor on this project.

I hope to be able to publish the next issue of *Banisteria* on schedule in the spring. To date, I have accepted one paper, one shorter contribution, and one book review. About a dozen other papers and notes have been received and are currently being reviewed. I invite others to submit manuscripts at any time for possible publication in *Banisteria*. See the society's website for the instructions for authors. Page charges are waived for VNHS members and are only \$15 per printed page for non-members.

Steve Roble, Editor, *Banisteria*

Announcements

1. Virginia Natural History Society Symposium

The Society is very pleased to announce our symposium on the history of the leading naturalists active in Virginia during the past 400 years. The symposium, **Historical Explorations into Virginia's Natural History**, will be held on September 26, 2009, at the Virginia Museum of Natural History in Martinsville. Presentations on over a dozen fields of natural history will be conducted by leading scientists. Detailed information on speakers, registration, and

accommodations will be mailed to all members. Make plans to attend. Contact Tom McAvoy for more information, tmcavoy@vt.edu.

2. News of Members

Two of the society's past presidents recently retired after three decades of service to their respective schools. To date, Richard (Dick) Neves has been the longest serving president of VNHS (ca. 3.5 years from 1997-2000). He joined the fisheries and wildlife department faculty at Virginia Tech in 1978, where he also served as the unit leader of the Virginia Cooperative Fish and Wildlife Research Unit for many years. He retired in August 2008 and is now an Emeritus Professor. A brief powerpoint presentation prepared for his retirement party can be found here: www.fishwild.vt.edu/temp/Dick%20Neves%20retires.pdf

Barry Knisley previously served as the first vice president (1992-94) and second president (1995-96) of VNHS. For the past two years he has served in the former role again and will begin his second 2-year term as president in January 2009. Following a 10-year stint at Franklin College in Indiana, Barry joined the biology department faculty at Randolph-Macon College in Ashland, Virginia, in 1979. He retired in May 2008 and is now an Emeritus Professor.

Two other long-time VNHS members, John Holsinger and John Pagels, also recently retired from their biology faculty positions at Old Dominion University and Virginia Commonwealth University, respectively. Both are now Emeritus Professors.

In May 2008, Joe Mitchell, a cofounder of VNHS and longtime former coeditor of *Banisteria*, received the Thomas Jefferson Medal for Outstanding Contributions to Natural Science during a ceremony at the new Virginia Museum of Natural History facility in Martinsville. The award has been presented annually since 1988 by the Virginia Museum of Natural History Foundation to "an individual who has consistently made outstanding contributions to natural history."

Congratulations to each of the above members on their career accomplishments.

On a sadder note, E. Carter Nettles, Jr., a prominent retired lawyer and lifelong resident of Wakefield, and a member of VNHS since 2002, died on December 25, 2008, at the age of 72. He was also a member of the Virginia Native Plant Society and the Virginia Chapter of The Nature Conservancy. Mr. Nettles was an amateur naturalist with a particular interest in the Piney Grove Preserve near Wakefield and its resident population of the federally endangered Red-cockaded Woodpecker, the last known in Virginia.

Virginia Natural History Society
Website: va-nhs.org

General Information

The Virginia Natural History Society (VNHS) was formed in 1992 to bring together persons interested in the natural history of the Commonwealth of Virginia. The VNHS defines natural history in a broad sense, from the study of plants, animals, and other organisms to the geology and ecology of the state, to the natural history of the native people who inhabit it. The goals of the VNHS are to promote research on the natural history of Virginia, educate the citizens of the Commonwealth on natural history topics, and to encourage the conservation of natural resources. Dissemination of natural history information occurs through publication of the journal *Banisteria*, named for John Banister (1650-1692) who was the first university-trained naturalist to work in Virginia. The first issue was published in 1992, and the journal is published twice per year in spring and fall. Articles cover a wide array of subjects, and prospective authors are encouraged to submit manuscripts on any aspect of natural history in Virginia; book reviews and biographies of relevance to natural history in Virginia are also welcomed. The editor of *Banisteria* will also consider manuscripts on any aspect of natural history from neighboring states if the information concerns a species native to Virginia or the topic is directly related to regional archaeology, anthropology, botany, ecology, zoology, paleontology, geology, geography, or climatology. Manuscripts are peer-reviewed for suitability and edited for inclusion in the journal. Page charges (\$15/page) are waived for VNHS members. The society's website contains instructions for authors, the titles (and abstracts beginning in 2004) of all *Banisteria* papers, and downloadable versions (PDF format) of numerous articles from past years.

Memberships

The VNHS is open to anyone with an interest in natural history and welcomes participation by all members in society activities and efforts to promote education and conservation. Membership includes a subscription to *Banisteria* and invitations to periodic symposia and BioBlitz surveys. Annual dues for members are \$20 (per calendar year); library subscriptions are \$40 per year. Checks should be sent to the Secretary/Treasurer, who also has back issues of *Banisteria* available at \$10.00 each (except Nos. 1-6 are \$5.00 and No. 13 is \$18.00). The VNHS is a tax-exempt, nonprofit, society under Section 501(C)3 of the IRS. We welcome donations to support our mission in Virginia.

The Virginia Natural History Society
Application for Membership

Name _____

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Crayfishes of Great Falls Park (George Washington Memorial Parkway, Virginia) found during the Potomac Gorge BioBlitz, 23 June 2006. Specimens represent the largest individual collected of their respective species within the park boundary. From left to right, *Orconectes virilis*, *Cambarus diogenes*, *Cambarus bartonii*, and *Orconectes limosus*. (Photo by Zachary Loughman)

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