

# BAT INVENTORIES OF THE NATIONAL CAPITAL REGION NATIONAL PARKS



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## Abstract

We inventoried bats within 11 National Capital Region (NCR) National Parks during 2003 and 2004, using mist nets, harp traps, and Anabat II bat detectors in fields, forests, riparian zones, and at caves. Our efforts included 365 mist net/harp trap nights at 74 locations and 362 locations monitored with bat detectors. We captured 383 bats representing 6 species. We collected and analyzed 6,380 bat calls, identifying 7 species, including 1 not previously captured, the silver-haired bat (*Lasiomyotis noctivagans*). Relative frequencies of some bat species varied according to park land cover, surrounding land uses, and overlap of geographic ranges and park boundaries.

## Introduction

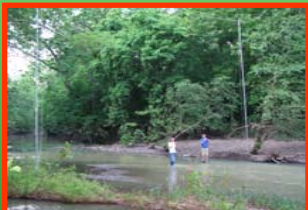
- All 10 bat species that may occur at NCR National Parks are insectivorous and constitute an integral component of the ecosystem.
- The rare eastern small-footed bat (*Myotis leibii*) and endangered Indiana bat (*M. sodalis*) potentially occur at NCR National Parks.
- The variety of roosting and foraging opportunities in each NCR National Park may influence species distributions and relative abundances among parks.

## Study area

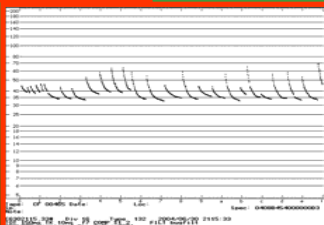
- NCR National Parks encompassed 26,203 ha in Maryland, northern Virginia, Washington, D.C., and West Virginia.
- Land uses and habitats surrounding and within the NCR National Parks were a mosaic of urban development, agricultural fields, upland and riparian forests, lentic and lotic waterways, and wetlands.
- Elevation ranged from sea level in the Washington, D.C. area, to over 500 m at Catoctin Mountain Park.

## Methods

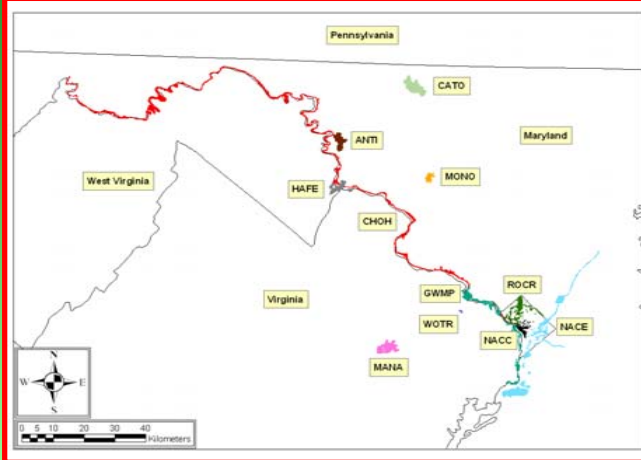
- We used mist nets erected over stream corridors, hiking trails, and service roads to capture bats. Mist nets were constructed in 1-tier and 3-tier arrangements. Mist netting was conducted for 5 hours following sunset. The species of each captured bat was determined as well as its weight, forearm length, sex, age, and reproductive condition before being released.
- We used Anabat II broadband, frequency division, bat detectors to collect echolocation calls of bats active in the parks. We monitored each location for 20 minutes. We monitored in various cover types including wooded trails, riparian areas, open fields, and meadows to more accurately assess bat species composition based on species' different foraging strategies.



Technicians setting up 3-tier mist net over Bull Run, Manassas National Battlefield Park, 2003.



Echolocation call of eastern red bat (*Lasiurus borealis*) viewed in Analook



National Capital Region National Parks inventoried for bats, 2003 - 2004.

## Park identification key

ANTI = Antietam National Battlefield  
 CATO = Catoctin Mountain Park  
 CHOH = Chesapeake and Ohio Canal National Historical Park  
 GWMP = George Washington Memorial Parkway  
 HAFE = Harpers Ferry National Historical Park  
 MANA = Manassas National Battlefield Park  
 MONO = Monocacy National Battlefield  
 NACE = National Capital Parks - East  
 ROCR = Rock Creek Park  
 WOTR = Wolf Trap National Park for the Performing Arts

## Bats captured at National Capital Region National Parks, 2003 - 2004.

Park	Mist net sites	Species							
		All	EPFU	LABO	LACI	MYLU	MYSE	PISU	
ANTI	5	30	4	11	0	15	0	0	
CATO	6	51	10	7	0	20	14	0	
CHOH	19	116	27	20	2	60	1	6	
GWMP	7	62	40	3	0	9	0	10	
HAFE	6	16	4	3	0	0	9	0	
MANA	8	12	7	3	0	0	0	2	
MONO	5	18	6	6	0	3	0	3	
NACC	1	1	0	1	0	0	0	0	
NACE	7	21	19	2	0	0	0	0	
ROCR	8	49	28	4	1	2	2	12	
WOTR	2	7	4	3	0	0	0	0	
Total	74	383	149	63	3	109	26	33	

## Bat species key

EPFU = *Eptesicus fuscus*; big brown bat  
 LABO = *Lasiurus borealis*; eastern red bat  
 LACI = *Lasiurus cinereus*; hoary bat  
 MYLU = *Myotis lucifugus*; little brown bat  
 MYSE = *Myotis septentrionalis*; northern myotis  
 PISU = *Pipistrellus subflavus*; eastern pipistrelle

## Results and Discussion

- Acoustic monitoring consistently detected all species captured in mist nets and species that were not captured, therefore providing a more complete documentation of bat communities.
- NCR National Parks contained habitat suitable for most bat species common in the Mid-Atlantic region.
- Reproduction and recruitment occurred at most NCR National Parks, but varied among species and parks.
- Big brown bats (*Eptesicus fuscus*) were the most ubiquitous and probably the most abundant bat species, particularly at urban parks within NCR National Parks.
- Northern myotis (*Myotis septentrionalis*) and, to a lesser extent, little brown bats (*M. lucifugus*) were not as prevalent in urban parks, which may be a result of forest fragmentation or the consequence of surrounding development. Catoctin Mountain Park, an almost entirely forested rural park, produced more northern myotis captures than all other parks combined.
- Urban parks were farther from hibernacula and may be on the periphery of little brown bat and northern myotis summer ranges. Forested urban parks that were similar distances from hibernacula had more little brown bat and northern myotis activity than fragmented urban parks.
- Although we detected no rare or endangered bats, historic records of eastern small-footed bats and Indiana bats occurred on nearby properties, indicating that these species could occur in low numbers in some parks, e.g., the Chesapeake & Ohio Canal National Historical Park.

## Acknowledgements

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Eastern red bat captured at Catoctin Mountain Park, 2004.



Little brown bat captured in a mist net at George Washington Memorial Parkway, 2003.



Hoary bat (*Lasiurus cinereus*) captured at Rock Creek Park, 2003.



Eastern pipistrelle (*Pipistrellus subflavus*) captured at Monocacy National Battlefield, 2004.