National Capital Region Inventory & Monitoring Network

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Searching for Orchids in the Catoctin Mountains

In 2016, the National Capital Region Network, Inventory & Monitoring team (NCRN I&M) will census native orchids at Catoctin Mountain Park (CATO). The study follows up on a 41-year orchid annual census (1968-2008) by Maryland Natural Heritage Program (MD NHP) scientist Richard Wiegand that showed precipitous declines in Catoctin Mountain orchid populations. We hope to find out if orchid population sizes have begun to rebound following reductions in deer density at CATO since 2010.

A paper describing the long-term orchid census dataset was published by Wiegand and another MD NHP scientist, Wes Knapp, in 2014. The paper states that 21 genera and 51 species of orchids are known in Maryland, occupying a wide array of habitats. In the Catoctin Mountains of Frederick County, 27 species (native and non-native) have been informally reported.

There are eight sites with historic orchid data in Catoctin Mountain Park and Cunningham Falls State Park. The 7 orchid species represented at those sites (in order of typical peak flowering period) are:

Pink lady's slipper (*Cypripedium acaule*)
Showy orchid (*Galearis spectabilis*)
Lily-leaved twayblade/brown widelip orchid (*Liparis liliifolia*) [rare]
Large round-leaved orchid (*Platanthera orbiculata*)
Greater purple fringed orchid (*Platanthera grandiflora*) [threatened or endangered]
Small green wood orchid (*Platanthera clavellata*)
Downy rattlesnake plantain (*Goodyera pubescens*)

We aim to sample most species during peak flowering, when they are most easily detected. Showy orchid (*Galearis spectabilis*) and pink lady's slipper (*Cypripedium acaule*) however, are easily recognizable outside of peak flowering and we will sample these two species past their flowering period (due to the timing of our field season).

To learn more about orchids in the

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Copies of this and other issues are available at http://science.nature.nps.gov/im/units/ncrn

Pink lady's slipper (*Cypripedium acaule*)

Catoctin Mountains, check out the 2014 article by Knapp and Wiegand entitled "Orchid (Orchidaceae) decline in the Catoctin Mountains, Frederick County, Maryland as documented by a long-term dataset." The article appeared in the journal Biodiversity and Conservation, Volume 23, Issue 8, pp 1965-1976. http://link.springer.com/article/10.1007%2Fs10531-014-0698-2

For more on NCRN's orchid project, contact Megan Nortrup at NPS email or 202-339-8314.

Left: The pink-flowered, showy orchid (*Galearis spectabilis*)

Right: The delicate white-flowered, large round-leaved orchid (*Platanthera orbiculata*).

Photo: NPS/Nortrup

Photo: NPS/Schmit

Centennial BioBlitz Nears

The Centennial BioBlitz of May 20-21, is quickly approaching! Parks across the region have already set up many BioBlitz activities including things like a spider-seeking "arachnablitz" at Dyke Marsh, a snakehead fishing derby at Violette's Lock along the C&O Canal, and a bird walk and count led by the local Audubon Society chapter at Wolf Trap. The range of activities will continue to expand as additional science experts are paired up with interested parks.

If you know anyone interested in taking part in BioBlitz activities, they can:

- register as a participant in an inventory activity,
- become a ProObserver who assists participants in using the iNaturalist app. Registration for parks outside the beltway is at: https://goo.gl/x3dLwB and for parks inside the beltway: https://goo.gl/NKLdca
- volunteer to assist with inventories, events, or booths with your favorite park.

Stay tuned to the latest developments at https://sites.google.com/a/nps.gov/centennialbioblitz/ or http://www.nps.gov/subjects/biodiversity/index.htm

I&M Spring Field Schedule

For specific dates contact Megan Nortrup by NPS email or check the "NCRN I&M Activity" calendar which has been shared with NCR natural resource staff through BisonConnect gmail.

The calendar shares dates when I&M field staff will be working in your park. You and your interns and volunteers are welcome to join us in the field to learn about how NCRN I&M monitors natural resources in your park.

March, April, and May 2016	Amphibians	Forest Birds	Forest Soils	Forest Vegetation	Grassland Birds	Marsh Elevation (SET)	Water (quarterly)	Water (continuous)
Antietam National Battlefield		X	X	X	X		X	X
Catoctin Mountain Park	X	X	X	X			X	X
Chesapeake & Ohio Canal NHP	X	X	X	X				
George Washington Memorial Parkway		X	X	X		X	X	X
Harpers Ferry NHP	X	X	X	X	X		X	
Manassas National Battlefield Park	X	X		X	X		X	X
Monocacy National Battlefield	X	X	X	X	X		X	
National Capital Parks - East		X	X	X		X	X	X
Prince William Forest Park		X	X	X			X	X
Rock Creek Park	X	X	X	X			X	X
Wolf Trap NP for the Performing Arts		X		X			X	

Park Acronyms

ANTI = Antietam National Battlefield
CATO = Catoctin Mountain Park
CHOH = Chesapeake & 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
NAMA = National Mall and Memorial Parks
PRWI = Prince William Forest Park
ROCR = Rock Creek Park
WOTR = Wolf Trap National Park for the Performing Arts

A Rising Tide Changes Anacostia and Potomac Marshes

Geoff Sanders, Data Manager, National Capital Region Network, Inventory & Monitoring

Sea-level rise is on track to slowly raise water levels along the Anacostia and Potomac Rivers in the next 50 to 80 years. In response, scientists have created a planning tool for managers to visualize potential changes in tidal marshes and adjoining forests and upland areas.

The tidal areas of the Anacostia and Potomac Rivers were once lined by rich marshlands teeming with fish, birds, and other creatures. As Washington, DC grew, these marshes were gradually drained and developed. Only a few tidal marshes remain today, including Dyke Marsh and the marshes of Piscataway Park on the Potomac, and Kenilworth and Kingman Marshes on the Anacostia.

Now these remnant, NPS-protected tidal marshes are threatened by sea-level rise caused by climate change. While global sea-level rise is roughly 1.5 mm/year, the rate of rise for the Washington, DC area, (according to a long-term NOAA tide gauge in the Washington Channel) is roughly 3.2 mm/year. More than double the global average! The difference is due to local factors such as land subsidence and shifting ocean currents.

Luckily, unlike buildings and roads, tidal marshes have the ability to adapt to sea-level rise by rising as sea levels rise (by adding layers of sediment) and migrating inland into other habitat types. The ability of tidal marsh to adapt is diminished however, as the rate of water level rise accelerates and inland migration is hampered by barriers like roads, buildings, and elevation change. Wetlands along the tidal Potomac and Anacostia Rivers are already feeling the pressure.

Effectively managing these marshes depends in part on predicting future changes from rising sea levels. To address this, scientists from the University of Maryland (sponsored by the NPS Climate Change Response Program) developed a model called the Marsh Accretion and Inundation Model (MAIM). Scientists feed the model data on sedimentation rates, elevation, and land classification and the model is designed to create maps projecting habitat changes under various sea-level rise scenarios.

Photo: NPS/Paradis

The wetland plant, pickerel weed (*Pontederia cordata*).

For this project, scientists produced projections in ten-year increments from 2010 through 2100. Detailed habitat maps are produced for each 10-year period showing how vegetation types will change with progressively higher water levels.

The results? The model showed that regardless of the projected rate of sea-level rise, the tidal areas of the Potomac and Anacostia all lost land area as low lying habitat converted to tidal flats or open water. However, significant losses were only observed when the highest sea-level rise scenario (1.7 m of rise by 2100) was applied to the model. When lower scenarios were applied (0.7 and 1.1 m by 2100) the marshes remained more stable.

Marsh habitat grew as forested and upland areas were converted to marsh habitat. The growth in tidal marsh habitat was only possible because of inland migration. Development and elevation will eventually create a barrier to marsh migration at which point marsh habitat will be flooded and lost to open water.

The goal of this project was to provide managers with a planning tool to visualize some of the potential changes park land might experience over the next 50 to 80 years. While the model does not account for every possible combination of factors, the hope is that it will help managers prioritize management actions now to address changes predicted years into the future. Proactive management actions could help protect natural, cultural and historical resources as well as park infrastructure.

For more information on this modelling project visit: https://irma.nps.gov/DataStore/Reference/Profile/2223826

Photo: NPS

Aerial view of Dyke Marsh

Science & Education: UERLA Updates

Bringing together science and education is the primary mission of the Urban Ecology Research Learning Alliance (UERLA). UERLA, which serves all parks in the National Capital Region, welcomed Ann Gallagher this September as its new Science Education Coordinator.

Spotlight Meeting

In spring 2016, UERLA is leading the Steering Committee that's planning the Centennial Spotlight on National Park Resources meeting. The Spotlight meeting highlights two years of studies and scholarship on natural and cultural resources. The biennial event gives parks a chance to interact with researchers. It will take place April 21 at the National Conservation Training Center in Shepherdstown, West Virginia.

BioBlitz

UERLA is also assisting with NCR Centennial BioBlitz preparations. We are excited to help parks host students, teachers, and scientists for the event on May 20-21. If your park is looking for opportunities to facilitate events that encourage new visitors or close knowledge gaps, UERLA is prepared to help find partners to serve your park's needs.

Climate Change Communication Interns

This summer UERLA is working with our Chesapeake Watershed Cooperative Ecosystem Studies Unit (CW-CESU) partner, George Mason University, for a fourth year of the Climate Change Communication Internship Program. Two teams of interns will work with parks to create messages about climate communication impacts to park resources in GWMP and in other parks.

Contact Us

If your park is interested in participating in any of these projects, is seeking science support in general, or would like to develop something entirely new, don't hesitate to contact UERLA—that's what UERLA is here to do! Contact Ann Gallagher by NPS email or at 202-339-8320.

A picture post in Wolf Trap's "dimple meadow" engages visitors in a citizen science project looking at phenology through photographs.

Photo: NPS

Calendar

APRIL

14. Natural Resources Advisory Team (NAT) Meeting. MONO.

21. Spotlight on National Park Resources Biennial Meeting. NCTC, Shepherdstown, WV.

MAY

20-21. NCR Centennial BioBlitz. Sites in and around Washington, DC with a "Biodiversity Festival" on the National Mall. http://www.nature.nps.gov/biology/biodiversity/bioblitz2016.cfm

JULY

21. Natural Resources Advisory Team (NAT) Meeting. MANA.

OCTOBER

20. Natural Resources Advisory Team (NAT) Meeting. CHOH.

National Capital Region Network Inventory & Monitoring (NCRN I&M) Staff:

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GIS Specialist: Leslie Frattaroli
Hydrologic Technician: Tonya Watts
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Science Communicator: Megan Nortrup

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NCRN Natural Resource Quarterly offers updates on the status of park natural resources and Inventory and Monitoring (I&M) "vital signs" for the NPS National Capital Region Network (NCRN).

Questions or comments? Contact Megan Nortrup by NPS email or at 202-339-8314