



NCRN Natural Resource Quarterly

FALL 2012

Emerald Ash Borer Update

After years of monitoring and close calls, our luck has finally run out. Emerald ash borer (EAB), already known to be in the capital region, finally showed up in two National Capital Region parks this summer. The beetles, who fatally chomp through the vascular system of all species of ash trees (*Fraxinus* sp.), were confirmed in July at Antietam and at the C&O Canal in Allegheny County.

Ash trees are present in all parks of the National Capital Region Network (NCRN). White ash (*Fraxinus americana*) is the most common, and the tenth most common tree of any species in NCRN forests. Other ash species in the NCRN are green ash (*F. pennsylvanica*), black ash (*F. nigra*), and pumpkin ash (*F. profunda*). All are susceptible to EAB.



emerge, but humans can spread EAB much faster by moving infected wood and tree material. We can help keep the spread slow by following bans on transportation of firewood, wood chips, and ash nursery stock.

Slowing the spread of EAB will allow time for biocontrols to start working. Since August 2009, the state of Maryland has released three species of EAB-specific parasitoid wasps. So far, the wasps are effective in saving ash seedlings and young trees with thin bark but not large trees, because the length of their ovipositors is too short to penetrate the thick bark of older trees.

I&M Forest Data and Veg Maps

Forest vegetation monitoring by the Inventory & Monitoring (I&M) program is poised to show the speed that EAB infects and kills ash trees. So far, no evidence of EAB has been found at any of the 400 forest vegetation plots throughout the NCRN. The green tree icons on the map on page 3 show all I&M forest plots in the NCRN. If the tree has a yellow dot inside, ash species are present.



D-shaped exit holes of EAB are about 1/8"

Photos: State of Wisconsin

EAB is Here. So Now What?

Take a close look at the map of positive EAB detections for the National Capital Region on page 3. It's clear EAB is in the region to stay, but it's not widely spread yet. Some areas will have more time than others before the beetles hit. EAB adults can fly at least 1/2 mile from the tree where they

Coming to Your Park this Fall

	ANTI*	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	PRWI	ROCR	WOTR
Deer Monitoring	x	x	x	x	x	x	x	x	x	x	x
Exotic Plant Management	x	x	x	x	x	x	x	x	x	x	x
Forest Vegetation Monitoring	x	x	x	x	x	x	x	x	x	x	x
Marsh Elevation Monitoring				x				x			
Water Monitoring	x	x		x	x	x	x	x	x	x	x
activities scheduled for Sept/Oct/Nov											

*Park acronyms on page 5

Maps of park plant communities (a.k.a. veg maps**) are another useful tool that can be used to locate some of the plant communities where ash species are present or dominant. The following plant community types list ash as a dominant species (covering the greatest area) or a diagnostic species (found consistently in the plant community) and may be of special interest:

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Veg Map Community Types Prominently Listing Ash Species	
Basic Woodland	CEGL003683
Upper Piedmont / Northern Blue Ridge Basic Mesic Hardwood Forest	CEGL006186
Potomac River Bedrock Terrace Oak - Hickory Forest	CEGL006209
Northern Hardpan Basic Oak - Hickory Forest	CEGL006216
Swamp Blackgum Freshwater Tidal Swamp	CEGL006287
Southern New England Red Maple Seepage Swamp	CEGL006406
Mid-Atlantic Terrace Hardwood Floodplain Forest	CEGL006459
Potomac Gorge Ice-Scour Floodplain Forest	CEGL006475
Northern Piedmont / Central Appalachian Maple-Ash Swamp Forest	CEGL006548
Chesapeake/ Piedmont Red Maple / Lizard's-tail Swamp	CEGL006606
Southern Appalachian Cove Forest (Typic Montane Type)	CEGL007710
Basic Seepage Swamp	CEGL008416

Monitoring Still Matters

As the map on page 3 shows, EAB is here, but not everywhere. So it's still worthwhile to track the beetles. Monitoring traps are available for 2013 through the US Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine program (USDA APHIS PPQ). To request an EAB trap, contact Matt Travis at 410-288-5540.

How Fast will the Trees Die?

Preliminary results from a study by Knight and Long et al. found that once infested, healthy ash stands can reach nearly 100% mortality of ash trees >1 inch diameter within six years. During the first few years, ash decline is very slow and symptoms of EAB are not obvious. Later in the infestation, ash mortality rates accelerate rapidly.

Cliff Sadoff of Purdue University outlined three basic phases of EAB destruction (three phases of a bell curve): the Cusp (1-4 years) from first infestation to initial establishment; the Crest (5-12 years) with a yearly spike in tree death around 9 years followed by decline as fewer trees are available for EAB to infest; and the post-Crest (13 years) when all trees are dead.

Tree Treatments

Regional Integrated Pest Management Coordinator Jil Swearingen recommends treating priority trees in

spring 2013 and continuing for the next 4-5 years as the EAB invasion wave moves through. However, treating large numbers of trees is generally seen as too costly and labor intensive to be a reasonable option.

Hope for the Future

Almost all ash trees in EAB-infested areas die. And ash have significant commercial, ecological, and landscape value, so experts are working on several plans to stop or slow EAB. Federal agencies led by the US Forest Service are working to preserve seed from a significant number of natural ash populations (http://www.nsl.fs.fed.us/geneticconservation_ash.html), biocontrols may someday bring EAB under control, and EAB-resistant trees could be found or developed. Slowest and most hopeful of all is that a very small number of trees don't succumb to EAB right away. Some may actually survive EAB. These "lingering ash" may be truly resistant or tolerant to EAB. In time, natural resistance from this tiny group may allow ash trees to flourish again.

References

- Knight, K., R. Long, et al. 2008. How Fast Will Trees Die? A Transition Matrix Model of Ash Decline in Forest Stands Infested by Emerald Ash Borer. http://nrs.fs.fed.us/pubs/jrnl/2008/nrs_2008_knight_001.pdf
- Maryland Department of Natural Resources. Draft Maryland Emerald Ash Borer Long-term Response Plan. <http://dnr.maryland.gov/dnrnews/pdfs/mdeablong-termplan2012.pdf>
- US Department of Agriculture APHIS. Emerald Ash Borer webpage. http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/index.shtml
- US Forest Service, Northern Research Station. Emerald Ash Borer: Control and Management webpages. http://nrs.fs.fed.us/disturbance/invasive_species/eab/control_management/

****Veg map accuracy assessment data is currently being edited and proofed.**



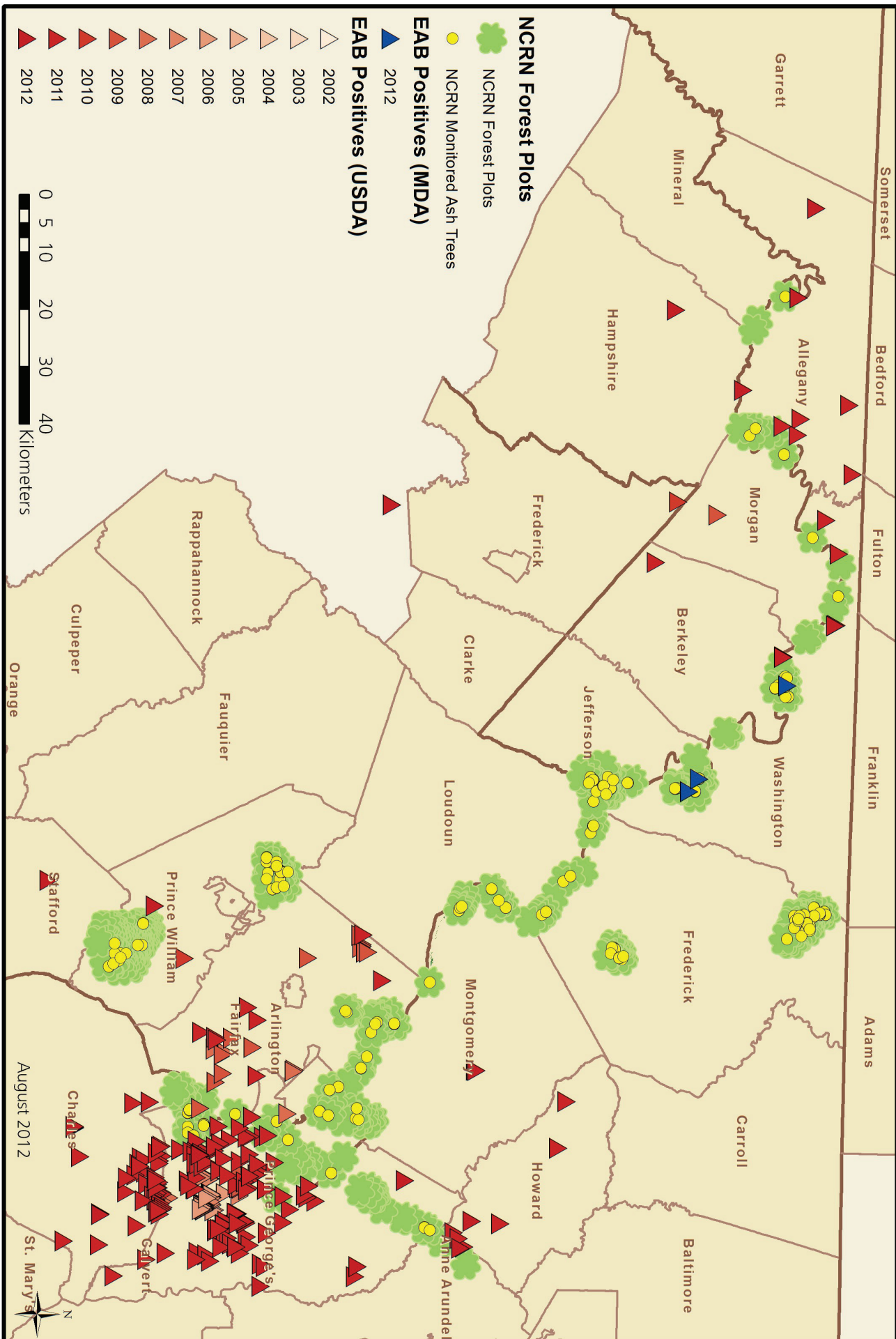
Seed, buds, and leaves of white ash (*Fraxinus americana*), the 10th most common forest tree in the NCRN.

Photo: US Department of Agriculture

Emerald Ash Borer and NCRN Forest Plots

Emerald Ash Borer Positive Identifications (USDA, MDA) and NCRN Forest Plots (with highlighting for Ash tree locations)

National Park Service
U.S. Department of the Interior



Our Search for Answers: The Evolution of IRMA

by Geoff Sanders, NCRN I&M Data Manager

Natural resource data management in the National Park Service has come a long way. Since the birth of the Natural Resource Challenge, NPS has developed an enterprise level data infrastructure that is available to users across the country. It's our online library, archive, and warehouse. It has a search engine that works like Google and enough content on park resources to keep us all reading for years.

Where it Began

But this system wasn't always so slick. NPS started with three separate systems: NatureBib, NPSpecies, and the NPS GIS Data Store. Each application had a specialized task: NPSpecies tracked the biodiversity of parks and provided park-specific species information; NatureBib provided a place to store and retrieve park-specific bibliographic information; and the NPS Data Store was the primary data clearinghouse for natural resources data sets. These applications functioned independently of one another and each required separate user accounts. Using them was often difficult, especially for the uninitiated.

Current Status

Out of an effort to solve these issues, the Integrated Resource Management Applications (or IRMA for short) was born. Unlike its predecessors, IRMA integrates (as the name suggests) all of the natural resource management applications into one portal. Getting there is a snap. No need to bookmark it. If you are working on an NPS computer just type “IRMA”

into your web browser. Once you are there, no need to worry about user names or password. The system identifies you automatically using the Active Directory system (look in the top right of the screen to see your username). If you are accessing IRMA from outside of the NPS network it is still easy to access the site (www.irma.nps.gov) but you will be recognized as a "Guest".

The IRMA portal greets users with a simple search screen (like Google) but there are also options to search specific applications like NPSpecies and the NPS Data Store (NatureBib and the Data Store were combined into a single application in IRMA). The mission is the same, but functionality is better and accessing and managing the information is much quicker and more intuitive.

Where it's Going

IRMA has already been operating for a few years but it really is only just getting started. It's not just limited to natural resources anymore either. Efforts are underway to expand the scope of IRMA (primarily the Data Store) to include cultural resource products and data sets. And in the future, IRMA may take under its umbrella the RPRS (Research Permitting and Reporting System) and the ICMS system (Interior Collection Management Software).

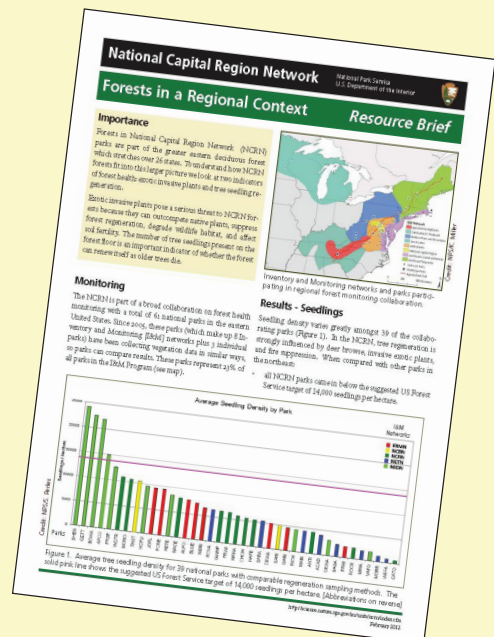
Anyone can search for information on IRMA and any NPS employee can enter new information into IRMA if they desire. For more information about using IRMA can contact Geoffrey Sanders at NPS email or at 202-339-8330.

Resource Briefs Now on IRMA

Resource Briefs are one of the latest things to be integrated into IRMA. Now, these short summaries of NCRN I&M monitoring results, can be found with a simple IRMA search. Use the search tool on the IRMA homepage (<https://irma.nps.gov/App/>) and search for: “NCRN Resource Brief” or “Park name” “Resource Brief”.

Resource Briefs cover topics including: fish, macroinvertebrates, forest vegetation, invasive exotic plants, freshwater sponges, and more. They also remain available, as always, on the NCRN I&M website at http://science.nature.nps.gov/im/units/ncrn/outreach_communication.cfm.

This resource brief describes how forests in NCRN parks differ from other national parks in the northeast in terms of forest seedling density and invasive exotic plant distribution. It's one of the many products available through IRMA.



Future Shock: Feral Hogs?

by Scott Bates, NCR Wildlife Biologist

Feral hogs may one day end up in your park. These animals have recently escaped or been released from captivity and include pigs/swine, wild boars native to Eurasia, and hybrids of wild boars and domestic pigs.

Feral hogs are omnivorous and at least half of their diet includes roots, leaves, fruits, and seeds. They like acorns and compete with deer, bear, turkey, and waterfowl for food. They also eat crustaceans, fish, snakes, frogs, small mammals, earthworms, insects, and the eggs and young of ground-nesting birds. Their rooting and wallowing can destroy native vegetation, cause erosion, and negatively affect water quality. In Great Smoky Mountains NP their wallowing decreases populations of shrews, voles, and salamanders as the leaf litter is disrupted or removed. Feral hogs can also transmit a variety of zoonotic diseases including pseudorabies, swine brucellosis, and trichinosis.

The color and size of feral pigs can vary widely. They can be black, brown, gray, red, tan, or cream colored. They can be belted (dark in color with a white band across the shoulders) or have color patterns like spots or stripes. They weigh anywhere from 125 to 450 pounds and their average litter size is 4 to 5 though it can be as high as 15.

A group of 25 to 50 feral hogs has been reported roaming near Calverton, Virginia, about 15 miles southwest of Manassas Battlefield.* It is likely that this population originated from hogs released by an individual interested in hunting them rather than being the natural expansion of a feral population.

For more information on feral hogs, contact Scott Bates by NPS email or call 202-339-8326.

*A map of feral pig locations in Virginia as of November 2010 can be found at: http://pubs.ext.vt.edu/news/livestock/2011/01/LU_01-01-11-10.html



Photo: NY Dept. of Conservation

A group of feral hogs.

Amphibian Monitoring Updates: Rock Creek and C&O Canal

Summaries of the latest data on stream and wetland amphibians from I&M monitoring in Rock Creek and C&O Canal are now available. The briefs are based on data from 2005 to 2011.

In the Potomac Gorge area of the C&O Canal, stream salamanders (northern dusky, northern two-lined, and northern red salamanders) have relatively stable occupancy rates. These species live in streams and on moist stream banks hidden under wood and rocks.

At Rock Creek, wood frogs and spotted salamanders have lower occupancy rates than the rest of the northeast. These species breed



Photo: NPS/Bowen

A stream salamander from Rock Creek.

in vernal pools that appear during the spring but dry up in summer.

The summary for the C&O Canal can be found at: http://science.nature.nps.gov/im/units/ncrn/products/briefs/AMU_CHOH_Amphibians.pdf

The summary for Rock Creek is at: http://science.nature.nps.gov/im/units/ncrn/products/briefs/AMU_ROCR_Amphibians.pdf.

Park Acronyms

ANTI = Antietam National Battlefield
CATO = Catocin 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

Didymo Decontamination

Didymo can be spread by a single algal cell so it is vitally important to decontaminate all equipment that is used in a water body to prevent its spread. Initially, an infestation of didymo can look like brown bubbles on rock surfaces before eventually blooming to form masses of woolly brown strands that blanket a stream bottom. Didymo infestations destroy critical habitat for fish and prey species and disturb spawning areas.

Upon exiting a water body, with or without documented didymo, always decontaminate all gear that came into contact with the water. Decontamination for didymo is much more thorough than recommendations to prevent spread of nuisance species promoted by the "Stop Aquatic Hitchhikers" program.

Didymo Decontamination Procedure

- 1) Remove all visible detritus before exiting the stream.
- 2) All equipment (including waders and boots) should be rinsed and allowed to dry thoroughly in a non-humid environment (<60%) for at least 48 hours to kill off didymo cells.

If equipment is to be used again in less than 48 hours or is used in more than one water body: Follow steps 3 & 4

- 3) Place ALL equipment that touched stream water into a decontamination solution for 1 FULL MINUTE and scrub.
- 4) Rinse equipment thoroughly with tap water. Allow the

rinse water to run onto the ground away from the stream.

Decontamination Solution Recipes:

10% Salt Solution (Recommended for boots and equipment): add 378 grams of NaCl to 1 gallon of warm water, conductivity reading of 150,000 $\mu\text{S}/\text{cm}$. Do not leave anything in the salt solution for an extended period of time as it can be slightly corrosive.

2% Virkon Solution (Option for non-electronic equipment and boots): add 21 gram of Virkon powder to 1 liter of warm water

5% Palmolive Solution (Recommended for FlowTracker. Option for all equipment and boots): add 50 milliliters of Palmolive soap to 1 liter of warm water. (This solution will require more rinse water.)

Full didymo decontamination procedures are in the didymo folder at <http://inpnrcsp.nps.doi.net:8094/Water/WRMT%20Document%20Library/Forms/AllItems.aspx>.



Tonya Watts, I&M water crew, scrubs waders and a tape measure in decontamination solution

Photo: NPS/Watts

Calendar

SEPTEMBER

13. Mid-Atlantic Early Detection Network invasive species training. Free. 9 am - 3 pm. NACE Park Police Headquarters. <http://www.eddmaps.org/midatlantic/>

19. Capital Region Invasive Pest Symposium. Free. Keynote

address on Emerald Ash Borer. Manassas, VA. Approx. 10 am - 2 pm. Contact Jil Swearingen by NPS email.

OCTOBER

18. NAT (Natural Resources Advisory Team) Meeting. C&O Canal Headquarters.

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

Program Manager: Patrick Campbell
Botanist: John Parrish
Data Manager: Geoff Sanders
GIS Specialist: Mark Lehman
Hydrologic Technician: Jim Pieper
Hydrologic Technician: Tonya Watts
Quantitative Ecologist: John Paul Schmit
Science Communicator: Megan Nortrup

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RSS: http://science.nature.nps.gov/im/units/ncrn/rss/ncrn_rss.xml
Twitter: <https://twitter.com/#!/NPSNCRN>

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