



NCRN Natural Resource Quarterly

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American Eels in the Potomac Watershed

Nick Walker, NPS Aquatic Ecology Intern

American eels are found everywhere along the Atlantic Coast from Iceland to Suriname and can swim up the Potomac River's Great Falls! But many aspects of these fish remain poorly understood. They are perhaps one of the most mysterious fish in the Potomac watershed.

In pristine times, American eels were one of the most abundant fish in Atlantic coastal streams. If you could catch and weigh all the fish present then, eel would have accounted for 1 of every 4 pounds! They were a valuable source of food for ospreys, raccoons, herons, and striped bass as well as a staple food for American Indians and early colonists. Today however, American eels have been reduced to less than 1% of their historic levels.

Threats

American eels are declining over much of their native range and the range itself is shrinking. Threats to this species

and its habitats include hydroelectric dams, stream fragmentation, pollution, parasites, overfishing, changes in ocean temperature, and changes to the eel's spawning grounds in the Sargasso Sea.

Eel Biology & Behavior

American eel are catadromous fish that can live for 20 years or more in rivers and lakes before migrating to the ocean to spawn. They follow the opposite path of anadromous fish, like salmon, which swim upstream to spawn.

Eel spawning grounds are in the Sargasso Sea, a strangely calm and warm area near Bermuda that Jules Verne described as a lake in the Atlantic Ocean because of the lack of wind. After hatching, larvae begin a long, slow journey toward the Atlantic coast. After reaching the mouth of an estuary or stream, larvae metamorphose to finger-size glass eels, then change to elvers, and then into yellow eels.

A large portion of the eel life cycle takes place in the yellow phase, when the eels usually

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A yellow American eel captured at Catoctin Mountain Park

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migrate upstream toward headwaters. Yellow eels eventually change color to dark green and then go through a final metamorphosis to become silver eels, which is when they become sexually differentiated. As inland distance increases, it is more common to find larger eels and more females. These silver eels migrate back to the Sargasso Sea in late summer and fall, although migration has also been observed at other times.

Potomac Population & Fishing

Despite their resilience, the American eel population has declined steeply since 1980. By 2008, the number of eels in the Potomac River was estimated at less than 2.4 million, with recruitment at less than a fifth of 1980 levels.

One of the main reasons for this decline was overexploitation. From 1950 to 2008, the Chesapeake Bay accounted for more than half of the U.S. yellow eel harvest, with 16% of that coming from the Potomac River since 1964. Female silver eels migrating downstream from the Potomac River to the Sargasso Sea decreased by an estimated 94% between 1980 and 2008.

At the start of 1992, the Potomac River Fisheries Commission imposed a 15 cm minimum size for American eel in commercial and recreational fisheries. Between 2001 and 2013 however, the Potomac River yellow eel fishery declined from over 200,000 pounds harvested to fewer than 50,000.

Protection- improvements

Fishing for American eel has been restricted in much of North America since 2000. Since then, eel landings have increased across the mid-Atlantic region, with the exception of Delaware and the Potomac River.

For the last decade, Maryland fisheries managers have been trying to restore the once-abundant Potomac River eel population. The Maryland Department of Natural Resources and the U.S. Army Corps of Engineers have studied the feasibility of removing dams along the Potomac River to improve fish passage and stream connectivity. Evidence from the Rappahannock River suggests this will have a positive effect on eels—when the 22-foot Embrey dam was removed, eels were able to return to habitats 150 km upstream in less than a year.

According to the Atlantic States Marine Fisheries Commission, as of 2000, there were 443 dams on the Potomac River. This reduced the American eel habitat from 28,140 km, the historical length of the Potomac River, to 3,281 km.

Dam removal & Fish Ladders

Eels are able to get through many barriers that other fish cannot. They are even capable of swimming upstream through Great Falls, which has several waterfalls of over 6 m. Eels are also able to get past barriers over land for short distances. A slimy mucous coating allows them to slither along the ground, especially when it is saturated.

That said, eel abundance is still greater in the lower sections of the Potomac than above natural and manmade barriers.

Fish ladders may provide an option for passage over such barriers. While eels seek slower current spots to get past obstacles (unlike anadromous fish that seek faster currents), they are also able to make use of fish ladders. For instance, eel distribution was significantly higher in Rock Creek following the 2006 construction of the Peirce Mill Dam fish ladder.

If eels are able to get upstream of a hydroelectric dam however, the return migration will present a real challenge since turbine blades can chop up an eel like a blender. One option to avoid this is for dam operators to turn off the turbines at night during migration time, although this can be an expensive solution.

The first fish ladder built specifically for eels opened in 2003 at the Millville dam on the Shenandoah River just upstream from Harpers Ferry. It has been described as looking like a long pegboard and allows the eels to slither up and over a dam.

Across the Atlantic coast, more than 2,500 miles of streams have re-opened through fish passage projects, with about 1,500 of those miles being re-opened since 2000.

Eels Near You

While eating an eel from the Potomac River may not be the best option—both the Virginia Department of Health and the D.C. Department of Energy and Environment advise against this because of polychlorinated biphenyl (PCB) contamination—there are other ways to get in touch with eels.

To look for them in your local stream, take your flashlight and head out on a dark night. Look near rocky crevices where eels like to hide and you too may be able to catch a glimpse of the mysterious fish that swims into our world before venturing back out in the Sargasso Sea.

Park Acronyms

ANTI = Antietam National Battlefield
CATO = Catoclin 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

Having a Blast at BioBlitz-Washington, DC!

The 2016 National Parks BioBlitz was a great success for cornerstone events in the National Capital Region (NCR) and across the nation. All 13 NCR parks took part in the BioBlitz, with nearly 300 scientists and experts leading more than 2,600 students and thousands of members of the general public. At the close of BioBlitz - DC, nearly 900 species had been identified for NCR parks.

Despite a rainy Saturday, park and regional staff, volunteers, partners, and BioBlitz participants were undaunted. The photos below show a few great BioBlitz moments.

BioBlitz totals for NCR parks as of May 23, 2016

iNaturalist BioBlitz Totals as of 5/23/16			
Park	Observations	Species	People
CATO*	329	94	29
CHOH	450	212	21
HAFE	292	169	12
MANA	517	211	21
MONO	249	137	9
PRWI	228	94	13
WOTR	407	170	21
NAMA	812	198	108
ROCR	1083	298	102
GWMP	757	327	60
Kenilworth	841	238	47
President's Park	143	61	25
Piscataway	978	286	45

*Park acronyms on page 2



Photos: NPS/Norstrup



Clockwise from top: a rainy plant survey at Wolf Trap; Rob Lamar leads a grass inventory at Harpers Ferry; a raptor demonstration at Manassas; and an eastern-tailed blue at Harpers Ferry.



Photo: NPS/Swearingen

Above: A young BioBlitz participant examines a millipede at Theodore Roosevelt Island.

Below: a long-tailed salamander at C&O Canal.



Photo: Wayne Hildebrand



Photo: NPS

Spring Birding Excitement in NCR

It's been an exciting spring for birds around the National Capital Region.

Peregrines

This spring, a pair of peregrine falcons nested on the cliff face of Maryland Heights at Harpers Ferry. To protect the birds, areas in and around the cliff face were closed on March 1 and will likely remain closed until mid-August (or about five weeks after any chicks that might be produced would take their first flights, or fledge, from their nest).



Photo: NPS/Paradis

Maryland Heights

Last year was the first time peregrines attempted to use the Maryland Heights cliff face for nesting since a unsuccessful 2000 park reintroduction program. No fledglings were produced last year.

Eagles at the Arboretum

A pair of nesting bald eagles at the National Arboretum in Washington, DC also made a big splash this spring. The raptors and their two chicks reached near celebrity status thanks in part to a pair of streaming video cameras (dceaglecam.org) that went viral. At last report, the juvenile eagles were in good health and expected to fledge from the nest in summer.

Common Ravens

And then, there were the ravens. Common ravens may not

sound too exciting beyond circles of Baltimore football fans, but breeding ravens haven't been seen in DC for over 100 years. That's why when Dan Rauch (Wildlife Biologist with the District Department of Energy and Environment) saw a pair nesting underneath a bridge along the Potomac River, it inspired some celebration.

The young ravens born under that bridge were doing well and already had their flight feathers in as of early May. It was expected they would be flying within 1 to 2 weeks.

Vultures

And last but not least, in March a pair of black vultures was seen for several days around a vacant building on K Street NW in downtown Washington, DC. (The street is perhaps best known as habitat for political lobbyists.) While many hoped the birds would nest, the birds apparently decided the environment was inhospitable and moved on.



Screengrab: dceaglecam.org

Juvenile eagles at the National Arboretum, named (through a well-handled social media contest) Freedom and Liberty. Photographed May 6, 2016.

The NPS Institutional Animal Care and Use Committee Review – A Reminder

Scott Bates, Wildlife Biologist, National Capital Region

Park projects that involve the use of vertebrate animals and have as their aim the collection of scientific information, teaching, and/or exhibition of said vertebrate animals, require NPS Institutional Animal Care and Use Committee (IACUC) review for compliance. Projects that have already been approved by your principal investigator's IACUC still require NPS IACUC review as the NPS is recognized by USDA-APHIS (the agency that enforces the Animal Welfare Act; "AWAR") as the sole guarantor of AWAR compliance in the NPS. Documents required for review include a signed copy

of the principal investigator's IACUC official approval notification and a copy of the complete and detailed study plan, including all animal use procedures. As with NEPA compliance, IACUC approval should be completed before approving the research permit.

Observational studies such as inventories or populations surveys are defined as field studies and do not require IACUC review. If a study involves an invasive procedure, harms, or materially alters the behavior of an animal, then it is not considered a field study and requires IACUC review.

Please contact Scott Bates 202-339-8326 for more information.

New Research Confirms Continued, Unabated and Large-Scale Amphibian Declines: Local Action Key to Reversing Losses

This material comes from a May 23, US Geological Survey press release available at: <https://www.usgs.gov/news/new-research-confirms-continued-unabated-and-large-scale-amphibian-declines-local-action-key>

New U.S. Geological Survey-led research suggests that even though amphibians are severely declining worldwide, there is no smoking gun – and thus no simple solution – to halting or reversing these declines.



Photo: NPS/Sealy

A spotted salamander at C&O Canal.

LAUREL, Md. -- New U.S. Geological Survey-led research suggests that even though amphibians are severely declining worldwide, there is no smoking gun – and thus no simple solution – to halting or reversing these declines.

“Implementing conservation plans at a local level will be key in stopping amphibian population losses, since global efforts to reduce or lessen threats have been elusive,” said Evan Grant, a USGS research wildlife biologist who led the study published in Scientific Reports today. “This research changes the way we need to think about amphibian conservation by showing that local action needs to be part of the global response to amphibian declines, despite remaining questions in what is causing local extinctions.”

The evidence shows that though every region in the United States suffered declines, threats differed among regions.

They include:

- Human influence from the Mississippi River east, including the metropolitan areas of the Northeast and the agricultural-dominated landscapes of the Midwest
- Disease, particularly a chytrid fungus in the Upper Midwest and New England
- Pesticide applications east of the Colorado River
- Climate changes across the Southern U.S. and the West Coast

Amphibian declines are a global phenomenon that this new research demonstrates has continued unabated in the United States since at least the 1960’s, and which are occurring even in protected national parks and refuges. Scientists have broadly linked declines to environmental factors like climate, human influence such as land-use change, and contaminants and disease, but have not been able to use actual scientific data on a large scale to discern causes of the ongoing disappearance of amphibian populations.

The new study is the first to test this linkage at a continental scale, and finds that the presence and intensity of the four main threats – human influence, disease, pesticide application, and climate change varies substantially across the US. The causes of the declines are more variable – and more locally driven – across the United States than had been assumed.

I&M Summer 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 specific parks. 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.

June, July, and August 2016	Amphibian Monitoring	Forest Birds	Forest Soils	Forest Vegetation	Grassland Birds	Marsh Elevation (SET)	Orchids	Water (quarterly)	Water (continuous)
Antietam National Battlefield		X	X	X	X			X	X
Catoctin Mountain Park	X	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	

Pat Campbell is New Chief of Natural Resources and Science for NCR

Patrick Campbell has been named the chief of natural resources and science for the National Capital Region. Pat has been the Regional Inventory and Monitoring Program Manager for the NCR where he has worked since 2006. He began work as chief in late May.

"I'm delighted to have someone as experienced and committed as Patrick Campbell step into the leadership role for our natural resources and science team," said Perry Wheelock, associate regional director for resource stewardship and science. "Pat's understanding of our region's challenges and resources is a great strength for the NCR."

As part of his duties, Pat will oversee the natural resource and science operations of NCR's Office of Natural Resources and Science (also known as the Center for Urban Ecology, or CUE). His new role includes engaging with park resource managers, superintendents and WASO NRSS programs.

Pat will oversee a staff of 18 scientists and technical experts with roles including inventory and monitoring, exotic plant management, aquatic ecology, wildlife biology and integrated pest management. With this interdisciplinary team, he will provide guidance and support to NCR parks on natural resource management.

"I'm very excited to work with such a talented group of

scientists and lead the interdisciplinary team that collaborates to protect and preserve this region's unique natural resources," said Campbell. "I am committed to supporting our parks in improving and conserving the quality of their natural resources."

Prior to his 10 years with the NPS, Pat spent 8 years with the Smithsonian Institution as a research and conservation coordinator with their Monitoring and Assessment of Biodiversity

Program. Pat also brings with him a wide variety of experiences including having worked as a wildlife biologist with the Zoological Society of London in Saudi Arabia. He started his career as a large mammal keeper at the Bronx Zoo.

Pat earned his master's in wildlife conservation from the University of Minnesota and his bachelor of science degree in wildlife science from the Pennsylvania State University in State College, PA.



J. Patrick Campbell

Photo: NPS/Nortrup

Calendar

JUNE

20-26. National Pollinator Week

JULY

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

AUGUST

25. National Park Service Founders Day. (NPS Centennial)

SEPTEMBER

25. National Public Lands Day

OCTOBER

9-15. Earth Science Week

12. National Fossil Day

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

24-31. Bat Week

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

Acting Program Manager: Geoff Sanders

Acting Botanist: Joe Kish

Data Manager: Sanders/Frattaroli

GIS Specialist: Leslie Frattaroli

Hydrologic Technician: Tonya Watts

Hydrologic Technician: Margie Shaffer

Quantitative Ecologist: John Paul Schmit

Science Communicator: Megan Nortrup

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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