Interior Region 1
National Capital Area

National Park Service
U.S. Department of the Interior

Spotlight on National Park Resources

in the National Capital Area

October 7-8, 2020

Virtual Meeting

Hosted by:
Cultural and Natural Resource Advisory Teams &
the Urban Ecology Research Learning Alliance

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- Spotlight Steering Committee and Moderators:

  Ann Gallagher, Chair (NCA NR/UERLA)
  Diane Pavek, Co-Chair (NCA NR/UERLA)
  Karen Orrence (NCA CR)
  Allison Young (NCA CR)
  Rebecca Loncosky (CATO NR),
  Anne Marie McKinney (PRWI CR)
  Kristen Shelton (PRWI NR)
  Shayna Lorraine Scott (HPTC CR)
  Lisa Lichliter (WASO CR)

National Capital Region Parks & Programs	Acronym
Antietam National Battlefield	ANTI
Catoctin Mountain Park	CATO
C&O Canal National Historical Park	CHOH
George Washington Memorial Parkway	GWMP
Harpers Ferry National Historical Park	HAFE
Manassas National Battlefield Park	MANA
Monocacy National Battlefield	MONO
National Capital Area	NCA
National Mall & Memorial Parks	NAMA
National Capital Parks - East	NACE
Greenbelt Park	GREE
Piscataway Park	PISC
Potomac Heritage National Scenic Trail	PHST
President's Park (White House)	PRPA
Prince William Forest Park	PRWI
Rock Creek Park	ROCR
Wolf Trap National Park for the Performing Arts	WOTR
Chesapeake Watershed Cooperative Ecosystem Studies Unit	CW CESU
Resource Stewardship and Science	RESS
Natural Resources	NR
Cultural Resources	CR
Museum Resource Center	MRCE
Historic Preservation Training Center	HPTC

October 7
Day 1 Session A

Moderator: **Becky Loncosky, CATO NR**
Chat Moderator: **Lisa Lichliter, WASO CR**

Speaker name **in bold**; See Abstracts for Co-authors

8:10 Orientation
Becky Loncosky - Spotlight Steering Committee, Biologist, Catoctin Mountain Park

8:15 Opening Remarks
Lisa Mendelson-Ielmini, Area Director, Interior Region-1, National Capital Area

8:25 Invasive Japanese Stiltgrass Indirectly Benefits Predator Community by Subsidizing Available Prey
Andrew Landsman - Natural Resource and Compliance Program Manager, NPS CHOH

8:45 Archives, Artifacts, and Activists…How to utilize Your Cultural Resources to Create an Engaging Virtual Tour
Vincent Vaise- Chief of Visitor Services, and **Kenneth Chandler**- Archivist, NPS NACE

9:05 Assessing Native Fish Recovery Potential for Catoctin Mountain Park
Nathaniel Hitt – Research Fish Biologist, US Geological Survey-Leetown Science Center, CW CESU Federal Partner

9:25 Developing Adaptation Managing Strategies that Enhance Resilience to Climate Change in NCA Parks
Don Faber-Langendoen—Senior Ecologist, NatureServe, CW CESU

9:45 **Break** Posters will be shown on rotation.

October 7
Day 1 Session B

Moderator: **Kristen Shelton, PRWI NR**
Chat Moderator**: Allison Young, NCA CR**

10:05 Ecological Importance of At-Risk Plants and Habitats in Harper's Ferry National Historical Park
Clara Thiel - Graduate Assistant, Applied Ecology and Conservation Frostburg University, CW CESU

10:25 Resource Assessments for Integrated Management Strategies
Katie May Laumann- Project Manager, University of Maryland Center for Environmental Studies, Integration and Application Network, CW CESU

10:45 Habitat Suitability for Sensitive Bird Species Within and Around C&O Canal National Park
Dylan Taillie - Graduate Student University of Maryland Center for Environmental Sciences--Appalachian Laboratory, CW CESU

11:05 Runoff and Erosion in Wolf Trap National Park for the Performing Arts
Sarah Paschal Gerenday- Graduate Student University of California Santa Barbara, Californian CESU, Geoscientist-in-Parks UERLA

11:25 **Adjourn Day 1**

October 8
Day 2 Session A

Moderator: **Becky Loncosky, CATO NR**
Chat Moderator: **Lisa Lichliter, WASO CR**

Speaker name **in bold**, See Abstracts for Co-authors

8:10 Orientation
Becky Loncosky - Spotlight Steering Committee, Biologist, Catoctin Mountain Park

8:15 Welcome
Sam Tamburro, NCA Chief of Cultural Resources Program

8:25 Freshwater Mussel Restoration in the Anacostia River
Jorge Bogantes Montero- Natural Resources Specialist Anacostia Watershed Society

8:45 There All the Time: African American History in the National Capital Area
Dean Herrin- Chief Historian NPS, NCA

9:05 Fire History and Dendroecology of Catoctin Mountain Park
Lauren F. Howard –Professor,-Department of Biology, Arcadia University, and **Gabriel D. Cahalan**, TNC Conservation Steward, Desert Southwest CESU

9:25 Preservation in Progress at Arlington House
Kimberly Robinson- Museum Curator, NPS GWMP

9:45 **Break**
Posters will be shown on rotation.

October 8
Day 2 Session B

Moderator: **Anne Marie McKinney, PRWI CR**
Chat Moderator**: Allison Young, NCA CR**

10:05 Commemoration at the Scale of a Nation: The National Capital Area Memorial Landscape
Sophie Kelly- Memorials Program Manager, NPS NCA

10:25 Forecasting Changes in Population Demographics and Forest Benefits in NCR Parks Using iTree-Eco
Harrison Sherman– Student Intern, UERLA and University of Maryland, CW CESU

10:45 From Recreational Development Area to Forest Park: Documenting Prince William Forest Park's C.C.C. Era Cultural Landscapes
Michael Spencer - University of Mary Washington, Department of Historic Preservation, CW CESU

11:05 Closing Remarks
Kristen Shelton, Spotlight Steering Committee, Biologist, Prince William Forest Park

Adjourn Day 2

Presentation Abstracts

Freshwater Mussel Restoration in the Anacostia River

Jorge Bogantes Montero -- Anacostia Watershed Society

The Anacostia Watershed Society (AWS) is pioneering freshwater mussel restoration in the Anacostia River to help improve water quality and to enhance aquatic biodiversity. In 2018 AWS deployed 9,000 unionid mussels of three native species in the tidal Anacostia River for one year. With this project AWS is helping determine mussel restoration feasibility in the river and gathering other valuable information in the process (i.e., nutrient sequestration and microplastics content). Because mussels alter sediments and nutrients from the water column, the resulting improved water clarity will enhance submerged aquatic vegetation beds, providing habitat for other bottom dwelling invertebrates, which can support fish communities. The first phase of the project has shown promising results and AWS is already expanding the propagation efforts in the Anacostia River. AWS is educating school students through an innovative educational program called "Mussel Power" as well as the general public through education and volunteering.

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Developing Adaptation Managing Strategies that Enhance Resilience to Climate Change in NCA Parks

Don Faber-Langendoen and Carl Nordman– NatureServe, CW CESU

Climate and non-climate stressors (such as edge effects, fragmentation, and invasives) threaten to undermine the natural resources of many national parks, including those in the National Capital Area. Natural Landscape Blocks and Connective Corridors provide a framework for developed adaptation management strategies to these stressors. The Natural Landscape Blocks are centered on Core Areas that contain Interior Forest with at least 100 m buffer from fragmenting features. The blocks can be expected to have higher resilience than areas lacking interior, as measured by higher Ecological Integrity (reduced edge effects, less invasives, greater plant and animal diversity and quality) and higher Adaptive Capacity (higher local landscape diversity and local connectivity). Park staff can use these blocks to focus their stewardship strategies to improve resilience and reduce the effects of climate change on park ecosystems. Ongoing levels of resilience will be monitored using metrics and thresholds developed for the Resource Assessments for Management Strategies interface, with data from the Inventory and Monitoring Program.

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Assessing Native Fish Recovery Potential for Catoctin Mountain Park

Nathaniel Hitt, Karli Rogers, Harmann Kessler, Zachary Kelly, and Heather Walsh – US Geological Survey, Leetown Science Center, CW CESU Federal Partner

Catoctin Mountain Park (CATO) supports a prized trout fishery and a healthy community of native fishes, with one exception: native Blue Ridge sculpin (*Cottus caeruleomentum*) appear to be extirpated from Big Hunting Creek above Cunningham Falls. Infection by a fungal-like protist is hypothesized to have contributed to the extirpation. However, warming stream temperatures in the study area also may be an underlying cause, either as a direct physiological effect or by exacerbating infection rates. We evaluated sculpin responses to conditions in CATO streams using a caged-fish experiment during summer 2019. Stream temperatures differed among cage sites (warmer in Big Hunting Creek than Owens Creek), and fish growth increased with temperature. Our results indicate that Big Hunting Creek is thermally suitable for Blue Ridge sculpin restoration. We discuss additional considerations for native fish restoration planning in CATO.

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Runoff and Erosion in Wolf Trap National Park for the Performing Arts

Sarah Paschal Gerenday --University of California, Santa Barbara, Californian CESU, Geoscientist-in-Parks UERLA

Wolf Trap National Park for the Performing Arts embodies an interface between forest, suburbs, and the wide and impervious Dulles Toll Road. The park contains two creeks and a network of storm drains, which were mapped as part of a hydrologic evaluation of the park in the summer of 2019, during which time the park experienced a significant flood event. In-person reconnaissance was combined with a HEC-HMS hydrologic model of the creeks and drainage network to identify areas of concern with regard to runoff and erosion. The results suggest that runoff from outside the park, particularly the toll road, has an outsized effect on erosion at WOTR, but it is not the sole cause. Several areas are identified where improvements could be made to prevent problems from future storms.

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There All the Time: African American History in the National Capital Area

Dean Herrin -- NPS National Capital Area

For too long, the history of African Americans in the National Capital Region was ignored, minimized, and unexplored. Since 2016, however, National Capital Area parks have conducted a number of projects on local African American history thanks to funding from the NPS Civil Rights Initiative. We are now in the fifth year of this funding, and I propose to (briefly!) take stock of what we have done and highlight a few examples of park projects. We have studied the history of African American education after the Civil War, the role of African American women in the suffrage movement, the little-known story of local African American CCC camps, the importance of the NPS's Summer in the Parks programming, and many other topics of African American history in the NCA. This work has inspired new preservation efforts, more inclusive interpretation, and the interest of a more diverse public audience.

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Fire History and Dendroecology of Catoctin Mountain Park

Lauren F. Howard -- Department of Biology, Arcadia University and Gabriel D. Cahalan, The Nature Conservancy, Desert Southwest CESU

Two published fire history studies in Maryland are Shumway et al.'s (2001) study of 20 oaks from Savage Mountain and Dobey et al.'s (1987) study of 8 pines on Catoctin Mountain. Our study was designed to reveal a detailed forest fire history at Catoctin Mountain Park and to examine the potential consequences of fire suppression. Tree size and age structure were used to make inferences about future successional trends in the absence of further disturbance (e.g., fire). We compared the ages of living trees to known fire dates in the dendrochronological record to determine the regeneration times for different tree cohorts. We compared seasonality of fires in the dendrochronological record with specific dates of fires in the written record from five local and regional newspapers.

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Commemoration at the Scale of a Nation: The National Capital Area Memorial Landscape

Sophie Kelly -- NPS National Capital Area

The National Capital Area parks are stewards to the most culturally significant memorials commemorating people and events pivotal to our Nation's history. While some memorials have stood since the Continental Congress, many memorials in our region were constructed within the last 50 years. Congress has authorized a dozen new memorials and is

reviewing legislation for even more. The National Park Service manages memorials as cultural resources, yet commemorative properties are typically not considered eligible for the National Register for their commemorative content. This talk discusses the National Capital Area's review of Congressionally authorized memorials and the philosophy behind managing new memorials as cultural resources. The talk will also provide a brief introduction to the memorials program—it's not just relevant inside the beltway! Learn how memorials are born and cared for in the National Capital Area!

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Invasive Japanese Stiltgrass Indirectly Benefits Predator Community by Subsidizing Available Prey

Andrew Landsman -- NPS CHOH, Karin T. Burghardt -- University of Maryland College Park, Department of Entomology; and Jacob L. Bowman -- University of Delaware, Department of Entomology and Wildlife Ecology, CW CESU

Invasive plant species cause a suite of direct ecological impacts, but subsequent indirect effects are more complex and difficult to detect. Negative indirect effects to other taxa can be wide-ranging; however, some species may cause ecological benefits in certain habitats or locations. We examined the direct and indirect effects of the invasive Japanese stiltgrass on the invertebrate communities of understory deciduous forests in Maryland. Invaded plots contained a significantly greater abundance of nearly all taxa, including predators, herbivores, and detritivores. Spider communities contained over seven times more individuals and exhibited higher species diversity and richness in the invaded plots. Despite these ecological benefits, isotope analyses showed that the invertebrate community was not nutritionally supported by stiltgrass, implicating changes in the nutritional dynamics of forest food webs in invaded habitats. These results highlight the importance of fully understanding both direct effects and species- and habitat-specific indirect effects of invading plant species when prioritizing invasive species removal or management efforts.

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Resource Assessments for Integrated Management Strategies

Katie May Laumann -- University of Maryland Center for Environmental Studies, Integration and Application Network, CW CESU

The Resource Assessment for Management Strategies project assesses park cultural and natural resources together, in a novel way. This partnership between NCA NPS and the University of Maryland Center

for Environmental Science provides park managers with resource assessments at the landscape level, aiding them in identifying conservation needs and prioritizing integrated efforts.

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Preservation in Progress at Arlington House

Kimberly Robinson – NPS GWMP

This session will explore the lessons learned from the restoration of Arlington House, the Robert E. Lee Memorial. I will highlight select challenges coordinating a large scale project with multiple park partners, constituents, concurrent projects and high staff turnover. I will touch on the combined efforts to restore the historic mansion, its outbuildings and grounds in the midst of developing new interpretive exhibits. changing park priorities and resource protection challenges.

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Forecasting Changes in Population Demographics and Forest Benefits in NCR Parks Using iTree Eco

Harrison Sherman – Student Intern, Urban Ecology Research Learning Alliance and University of Maryland, CW CESU

Climate change increases stress on already vulnerable species. Pests, pathogens, and changes to weather patterns (disturbance events) in forests have costly and environmentally catastrophic consequences. Studies suggest climate change induced drought and shorter, warmer winters increase risk of disease in US forests. NPS I&M Vegetative datasets for 7 parks in the National Capital Area, Region 1 from 2010 to 2013 were analyzed using the modeling tool, iTree Eco, developed cooperatively by the US Forest Service and partners, for estimating population demographics quantifying ecological benefits provided by urban forests, and forecasting changes over time. Two forecasts, (1) assuming no unusual mortality and (2) assuming a single, uninterrupted *Phytophthora ramorum* fungal infection event were compared. Changes in total population, carbon storage and sequestration, and pollution removal over the course of 30 years were evaluated and compared between the two forecasts to compare total and proportionate changes.

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From Recreational Development Area to Forest Park: Documenting Prince William Forest Park's C.C.C. Era Cultural Landscapes

Michael Spencer, Grace Smith, Garek Hannigan, Kathleen Keith, Anna Ruuskanen, McKinley Groves, Jessica Schmidt,

Paige McLachlan, and John Strangfeld -- University of Mary Washington, Department of Historic Preservation, CW CESU

Collaboration between the National Capital Area, Interior Region 1 and the Chesapeake Watershed Cooperative Ecosystem Study Unit (CW CESU), has over the past two summers (2018 and 2019) enabled Historic Preservation students at the University of Mary Washington to conduct Cultural Resource Inventories of C.C.C. era cabin camps located in Prince William Forest Park. While the project was setup to generate actionable data for the park, another goal was to expose students in historic preservation to industry "best practices" involving larger cultural landscapes, something that is often missing in preservation and public history program curriculums. While there were more than a few hiccups along the way, students and professors, learned quite a bit about the history of the park, the integrity and significance of the cabin camps, and the processes, including GIS/GPS technology, used to capture and present cultural landscape findings.

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Habitat Suitability for Sensitive Bird Species Within and Around C&O Canal National Park

Dylan Taillie -- University of Maryland Center for Environmental Sciences -- Appalachian Laboratory, CW CESU

Habitat (specifically, forest) management is a priority for the National Park Service and their partners. However, it is sometimes difficult to understand the relative importance of conserving or making changes to different patches of forest and the relative conservation benefit of an action taken by the NPS or their partners who own land surrounding the Park. My project models and explains how different management options would change the landscape and forest dynamics surrounding the C&O Canal National Historical Park, and how changes to this landscape would affect habitat for sensitive species of birds such as the Cerulean Warbler, Wood Thrush, and Golden-Winged Warbler.

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Ecological Importance of At-Risk Plants and Habitats in Harpers Ferry National Historical Park

Clara Thiel, Megan Carr, and Sunshine L. Brosi -- Frostburg State University, CW CESU

Harpers Ferry National Historical Park (HAFE) encompasses a variety of habitat types that support many unique and ecologically important plant species. Previous vegetation surveys have identified 56 species listed as rare, threatened, or endangered (RTE) in Virginia, Maryland, and/or West Virginia. In collaboration with state Natural Heritage Programs we

have redetected twelve RTE species. This project increases the accuracy of location information for these elemental occurrences and updates Biotics with more recent observations and the presence of specific invasive plant species threats. Surveys will continue through 2020 to document all newly discovered and previously listed RTE plant populations within HAFE. Observation data such as these aid in tracking changes in rare plant distributions, allow for further comprehension of the plants' ecological roles, and are important for the continued management and protection of designated habitat to ensure the integrity of historic flora and fauna at HAFE and other NPS units.

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Archives, Artifacts and Activists . . . How to utilize your cultural resources to create an engaging virtual tour.

Vincent Vaise and Kenneth Chandler – NPS NACE

While many archives, universities and museums have digitized their archival collections, seldom does one see them integrated into an overall interpretive experience virtually. Over the past two years, the divisions of Interpretation and Resources Management at National Capital Parks-East have been working with Aperture Films of Hollywood, California, to develop a virtual tour of the Mary McLeod Bethune Council House National Historic Site that incorporates the National Archives of Black Women's History. Rare historic images are used to create a "then and now" effect along with video and audio from the archives. In addition, a special archival section has been created as part of the virtual tour. This presentation will show the advantages of inter-divisional collaboration, provide "lessons learned" in developing a tour of this nature, share creative insights, and highlight a good model for future virtual tours of this nature.

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Poster Abstracts

Addressing Deferred Maintenance: An Orientation to Historic Leasing in the National Park Service

Katherine Boyle -- NPS Regional Archeology Program

The National Park Service (NPS) has about $11.9 billion in deferred maintenance, just under half of which can be ascribed to the historic and prehistoric structures in NPS that are listed on the National Register of Historic Places. One way to address this "backlog" is through the leasing of historic structures to assist in their upkeep. The leasing authority for NPS historic structures is implemented by 36 CFR Part 18. This program is underutilized partially because there is minimal formal training for NPS staff in initiating and managing park-level leasing programs. Providing an orientation to historic leasing may help to clarify just how useful a tool this can be for maintaining historic structures. This poster is meant to provide an overview of 36 CFR Part 18 along with the opportunities that historic leasing programs can provide in parks.

Using Social Science in National Park Service Climate Communications: A Case Study in the National Capital Area

Eryn Campbell – Student Intern Urban Ecology Research Learning Alliance, George Mason University, CW CESU

Since 2012, the NPS's Urban Ecology Research Learning Alliance and George Mason University's Center for Climate Change Communication have partnered on a collaborative "research-to-practice" internship program that employs students to produce interdisciplinary, science-based climate change communication products for parks in the National Capital Area (NCA). Materials created through this program are rooted in social science insights (e.g., trusted sources, place-based learning), climate science, and the communication needs of participating regional parks. The products (e.g., websites, videos, ranger toolkits) produced fulfill many functions: increasing public awareness of climate impacts on ark resources, nurturing the connection between people and places, meeting evolving interpretation demands, engaging visitors in climate dialogue, and helping parks to lead by example. The success and adaptability of this program has provided NCR parks with innovative products that support the park stewardship mission to preserve resources for future generations. Examples will demonstrate the breadth of work undertaken by interns.

Archeological Site Monitoring and Protection in NCA

Marian Creveling, Karen Orrence, and Katie Boyle -- NPS Regional Archeology Program

Currently, there are over 1,200 archeological sites in the National Capital Area. Many of these sites are due or overdue to have Condition Assessments. Sites are placed on an inspection schedule to assess their condition and determine whether they are being damaged or threatened by natural or human activity. Possible threats may include erosion, agriculture, visitor use, development, unauthorized excavations (looting), and climate change. A unique partnership between the Archeology Program of the Washington Support Office (WASO), the NCA Parks, and Regional Archeology Program successfully completed over 50 Site Condition Assessments at Antietam National Battlefield and Prince William Forest Park during 2019. WASO provided funding for two National Council for Historic Preservation Education interns and bought a Galaxy tablet, Trimble receiver, and software (Survey 1-2-3) to assist with recording site condition updates. The updates were recorded in the Servicewide Cultural Resource Inventory System (CRIS).

The Remarkable Subterranean Fauna of Seeps in the NACE

David Culver -- American University and Jenna Keany -- Northern Arizona University

NACE harbors a rich, shallow-subterranean fauna; some of the species are globally rare. We sampled 218 widely distributed seeps in NACE. Shepherd Parkway was a hotspot of seep occurrences and inhabitants. Two species—*Stygobromus* nova species (i.e., undescribed) and *Crangonyx shoemakeri*—tend to occur in different seeps, but *Stygobromus* occurred in cooler, more mineralized water. Keany found no significant differences between occupied and unoccupied sites for 6 water quality parameters: pH, temperature, conductivity, radon concentration, depth of clay layer, or oxygen. This suggests that all the NACE seep sites are potential habitat, and the overall system is one of semi-isolated populations that blink on and off as local extinctions and colonizations occur The seep complex is worthy of protection. Assuming the seeps are one overall system, then it is possible to draw a protection map for the seep fauna The first step should be the designation of 100 m diameter buffer zones around each seep.

Threatened Northern-long Eared Bat (*Myotis septentrionalis*) on Eastern National Park Lands

Samuel R. Freeze[1], W. Mark Ford[2], Sabrina M. Deeley[1], Katie Gorman[1], Hila Taylor[1], Nick Kalen[1], Michael St. Germain[3], Alexander Silvis[4], Michael Muthersbaugh[1], and Lauren

Muthersbaugh[1] -- [1]Virginia Polytechnic Institute and State University, [2]U.S. Geological Survey Virginia Cooperative Fish & Wildlife Research Unit, [3]Conservation Management Institute Virginia Tech, [4]West Virginia Department of Natural Resources

Throughout much of the East, the now federally threatened northern long-eared bat (*Myotis septentrionalis*) has largely disappeared based on the effects of White-Nose Syndrome. However, in contrast to surrounding landscapes and National Park Service lands throughout the region, residual populations have been observed in Fire Island National Seashore, Gettysburg National Military Park, Prince William Forest Park, Rock Creek Park, and Shenandoah National Park. Within these units, we have documented successful reproduction and maternity colonies, or groups of roosts that females use– representing the majority of currently known colonies in the mid-Atlantic. Northern long-eared bats appear to be selecting a wide variety of forest stand and tree condition, and in some cases, anthropogenic structures, as roosts. These National Park Service lands appear to provide habitat critical to their continued presence in the eastern US.

Managing a Self-sustaining Muskellunge Population in a Southern Riverine Environment

Josh Henesy -- Maryland Department of Natural Resources Freshwater Fisheries Program

The non-tidal Potomac River is Maryland's most popular freshwater fishery, largely due to the multiple angling opportunities and the accessibility provided by the C&O Canal. The Maryland Department of Natural Resources Freshwater Fisheries Program manages this resource to provide high quality and diverse angling opportunities to Maryland residents and visitors. A recent increase in popularity has prompted further investigation into Maryland's only Muskellunge fishery. The nonnative muskellunge have become a naturalized member of the sportfish community, relying entirely on natural reproduction. A radio-telemetry project, funded by Muskies Inc., investigated behaviors of muskellunge in a system where temperatures exceed stressful levels for this species. Results suggest that movements cease and muskellunge seek out thermal refugia during summer months. Our data revealed that when weekly average temperatures reached 24.5°C , > 51% of the muskellunge occupied thermal refugia; and at temperatures >28.5°C, 100% of muskellunge were in refuge sites.

Picture Posts - Increasing Citizen Science Participation in National Parks through Targeted Engagement

Jennifer Jones -- Intern Urban Ecology Research Learning Alliance, University of Maryland, CW CESU

Citizen science provides a mechanism for national ;ark visitors to contribute, document, and analyze changing climates. Despite simplicity of use and free access, attracting people to engage with established fixed-platform Picture Posts, which facilitate citizen science through repeat photography of the landscape, proves challenging to the NCA Parks. Analysis of published peer-reviewed citizen science research was conducted revealing that appealing to personal interests[1] proved most successful in improving participation rates. Therefore, the NPS can increase awareness of Picture Posts and attract participation of citizen science in National Parks by generating messages appealing to visitors' hobbies and interests, such as planting and blooming times for gardeners and birders and field trip opportunities for educators. Park specific strategies are presented for Picture Posts in Rock Creek Park, Kenilworth Aquatic Gardens, and Wolf Trap National Park for the Performing Arts.

Understanding the Effects of Tree Removal in Soapstone Valley using iTree Software

Lily Oliver – Student Intern, UERLA, University of Maryland

The US Forest Service i-Tree-Hydro modelling module is used to predict the effects of tree removal on the total flow, pervious runoff, and total suspended solids in Rock Creek Park's Soapstone Valley and in the Soapstone Valley watershed. i-Tree-Canopy is used to calculate the land cover percentages for the i-Tree-Hydro cover classes. Literature searches, a site visit to Soapstone Valley, and consultation with i-Tree experts informed model inputs. Land cover models included the current land cover prior to tree removal, predicted land cover after tree removal, and a possible revegetation scenario. Each was modelled for 3 representative years (average precipitation, a wet year, and a dry year) from the last 10 years. A short term, high intensity storm event and a long duration, low intensity storm event were modelled to understand the two extremes. Results showed that tree removal may have very little effect on either the Soapstone Valley watershed or the Soapstone Valley Park.

4-Year Survey of Dragonflies and Butterflies at Dyke Marsh Preserve

Jessica Strother, Friends of Dyke Marsh

A consecutive 4-year survey of butterflies and dragonflies documented in Dyke Marsh Preserve has yielded a baseline of species found there,

that was largely unknown. This information and data assist the Park in resource planning, management and interpretive services. It engages the public to work on planting and preserving host and nectar plants for butterflies, and conserving certain insects that dragonflies feed on. This effort also informs the public in addressing how to attract and preserve these species on their properties and in the community. Resource management for, and interpretation of, the existence of these insects assists the public in understanding their role in conservation of our natural world.

COVER IMAGE CREDITS: MOURNING CLOAK BUTTERFLY (*NYMPHALIS ANTIOPA)*— COURTESY NPS; 13TH MASSACHUSETTS INFANTRY REGIMENT, WILLIAMSPORT, MD—COURTESY US ARMY MILITARY HISTORY INSTITUTE; MARTIN LUTHER KING MEMORIAL—COURTESY NPS; WOLFTRAP CREEK STAIRS—COURTESY NPS