Phenology of black cherry and eastern tent caterpillars: The impact of global climate change

What will I get out of this?

Audience members will gain a better understanding of how climate change can affect plant-insect interactions and the adaptations of spring herbivores to cope with it.

**Abstract** 

Phenological shifts and the subsequent disruption of biotic interactions they provoke are among the most evident effects of climate change. We integrated phenology observations with lab manipulations to understand the seasonality of a common forest herbivore native to the U.S., the eastern tent caterpillar (Malacosoma americanum), and to forecast its response to climate change. These caterpillars have fluctuating populations, and early spring synchrony between caterpillar hatching and host plant (black cherry) budburst could be a major factor affecting populations, which would grow under synchrony and collapse under asynchrony. We documented the phenology of M. americanum and black cherry in Rock Creek Park, DC and identified their main temperature-related physiological restrictions. This study involved sampling 11 populations from three national parks, four state parks, and several private properties. We found population-level variation in seasonality-relevant traits of eastern tent caterpillars, suggesting that the caterpillar's vulnerability to climate change differs among populations.

Keywords

Climate change, insects

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### Informing Coastal Resiliency: Shorebird Nest Site Selection in a Post-Storm Environment

What will I get out of this?

How to collect and utilize sensitive species and habitat data to inform wildlife compatible resiliency planning

**Abstract** 

In response to climate change driven storms and sea level rise, coastal parks are grappling with resiliency strategies. Options include sand placement and dune construction, which may conflict with wildlife management. In 2012, Hurricane Sandy struck Gateway National Recreation Area, flattening dunes and giving biologists the opportunity to document changes in breeding piping plover habitat selection. In 2013/2014 GATE biologists recorded nest sites, derived available habitat from pre and post storm aerial imagery and mapped landcover. Results indicate increased nesting habitat, which piping plovers utilized. Nest distance from the intertidal zone increased, compared with pre-storm data, reducing nest flooding by 100%. GATE is involved in testing the iPlover app, which utilizes nest data to explore the influences of sand placement and sea level rise on piping plover nesting. The ability to understand shorebird responses to these variables is critical to formulating resiliency options that are compatible with endangered species recovery.

Keywords

Shorebirds, Resiliency, Hurricanes

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Using Science to Respond and Communicate Coastal Change: From Measured, to Collaborative, to Opportunistic

What will I get out of this?

With pressing needs for scientific decision support and avid community interest, Cape Cod National Seashore collaborates to monitor and educate about coastal and climate change.

**Abstract** 

The challenges of coastal change often materialize in an emergency, with little opportunity to build data and management programs in advance. Cape Cod National Seashore has been both prepared and lucky. The NPS long-term monitoring program established a strong science staff with peer-reviewed protocols in place to track the implications of storms and climate. When the latest Atlantic hurricane (Sandy) hit, research was ongoing. The NPS funded studies to prepare and recover, distributing short-term funding while standardizing methods, and sharing equipment and expertise. The likely result: a coordinated science program addressing salt marsh retreat, storm run-up, inlet formation and barrier beach management. The short term response has merged with a well-planned science and management program. To communicate with managers and educators, scientists have become videographers and web authors, to supplement reports and peer-reviewed publications. We anticipate the next major coastal change event with respectful caution as well as scientific curiosity.

Keywords

coasts, climate, communication

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Dr. Stephen Smith, Plant Ecologist, Cape Cod National Seashore, North Truro MA

Kelly Medeiros, Hydrologic Technician, Cape Cod National Seashore, North Truro MA

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### Climate Observations and Ecological Connections in Alaska's Arctic Parks

What will I get out of this?

Attendees will better understand the climatic trends and connections to ecological conditions in the Arctic.

**Abstract** 

Climate observations have evolved over 60 years in Alaska's arctic parks and show consistent long-term trends. Average temperatures have increased at least 4 degrees C and models project similar increases over the next 30-100 years. Ecological connections to the observed and projected climatic changes are significant. The length of time when shore-fast ice is present in Bering Land Bridge and Cape Krusenstern has decreased, affecting the impacts of storms on shoreline, and has effects on harvested populations of marine mammals. Warming permafrost will drive habitat transformation and important dependent subsistence wildlife populations. Winter icing events caused by increasing rain on snow have caused foraging hardships for ungulates and are likely to increase with warming winters. Fire frequency and severity is likely to increase, making for an ecosystem canted toward earlier seral stages. Finally, human responses to the changes include increasing shipping and resource development in a now summer ice-free ocean.

Keywords

Arctic, Climate Change

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**8021**Poster

#### Kahilina'i: Building Partnerships and Saving Trails on the Kona Coast

What will I get out of this?

The audience will learn about our successes building community-based partnerships with State offices, Native Hawaiian Organizations, and descendant Native Hawaiian communities through trail stabilization projects

**Abstract** 

Continuing the legacy of caring for trails practiced by generations of Native Hawaiian families along the Kona coast, earthquake damaged sections of the Kīholo-Puakō and the Pikohene-Kapalaoa have been repaired and stabilized. In a partnership effort by the National Park Service, Hui Aloha Kīholo (a Native Hawaiian Organization), Hawaiʻi Division of State Parks, Nā Ala Hele State Trails and Access Program, the 'ohana (families) of Napuʻu and community volunteers these ancient and historic trails have been repaired so they can safely be safely traveled by cultural practitioners and recreational hikers alike. The preservation team, made up of NPS archaeologists and Hawaiian stonemasons, hosted a variety of public workshops focused on traditional skills of dry-set stonemasonry and cutting edge technologies used to document the process, including LIDAR mapping.

Keywords

community, trails, partnerships

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## Assessing the Dynamic Tension Among Science, Management and Community Engagement at Boston Harbor Islands NRA

What will I get out of this?

Simple framework for assessing scientific studies for three factors - quality of science, management relevance, and community engagement, through case studies at an urban park.

**Abstract** 

Parks in urban settings have a tremendous opportunity to engage students and community volunteers in park stewardship and citizen-science, but also have the challenge of balancing community engagement priorities with the need to protect park resources and also facilitate science that will inform park management. Adding to this dynamic tension is the pressure from external researchers to utilize park lands as study sites, and the push from both within and outside park management to provide opportunities for partnerships around youth and citizen-science. This paper will explore the last ten years of science at Boston Harbor Islands National Recreation Area by assessing a number of scientific studies for their relative value in three categories: quality of science, management relevance, and community engagement.

(eywords <b>Citi</b>	en-science	, urban park	
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**7877**Poster

### **Building a Dark Sky Cooperative across the Colorado Plateau**

What will I get out of this?

Learn about the dark skies over the Colorado Plateau, activities that threaten them, and solutions created by a diverse partnership to protect the night sky.

**Abstract** 

As part of the National Park Service Call to Action, the agency is leading an effort to establish landscape scale conservation of dark skies free from light pollution. The Colorado Plateau is sparsely populated, has minimal impact from outdoor lighting, and a high percentage of public land ownership, resulting in an ideal place for launching this novel conservation effort. This voluntary effort will link citizens, communities, tribes, businesses, and state and federal agencies in a collaborative effort to protect natural darkness for people and wildlife. Impetus is driven by the popularity of public stargazing programs, the local tourism economy, and a sense of community pride in this natural and cultural heritage.

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night, sky, light

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Long-Term Monitoring of Summer Steelhead in Redwood Creek at Redwood National Park

What will I get out of this?

Audience will learn about listed species monitoring and the benefits of a long-term monitoring project to determine aquatic conditions in a National Park.

**Abstract** 

Summer steelhead (Oncorhynchus mykiss), a federally listed fish, have been monitored by the NPS for 34 years on Redwood Creek in Redwood National Park and private lands upstream. The adult fish migrate upriver in spring, hold in pools during summer, and spawn during winter. Park staff snorkel 24 miles of mainstem Redwood Creek in summer to index population trends. Additionally mainstem and tributary water temperatures are measured, coastal cutthroat trout counted, and other aquatic species noted. Redwood Creek summer steelhead are a declining stock. The combined effects of land use and significant storms have deposited large amounts of sediment in mainstem Redwood Creek, increased water temperatures, and degraded fish habitat. Given high summer water temperatures and absence of deep pools, the prospect for recovery of Redwood Creek summer steelhead is poor. The importance and other benefits of long-term monitoring are also discussed.

Keywords

Salmonids, Long-term monitoring,

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9164 Poster

#### **Quagga Mussel Management at Glen Canyon National Recreation Area**

What will I get out of this?

Attendees will learn about dreissenid prevention, containment and monitoring and the current status of quagga mussels in Lake Powell.

**Abstract** 

After years of successful efforts to prevent the spread of zebra and quagga mussels (Dreissena sp.) at Glen Canyon National Recreation Area, a population of quagga mussels (D. bugensis) was discovered in Lake Powell in 2012. Extensive monitoring resulted in a very early detection of the new infestation. At this time, impacts are minimal and mussel colonies can only be found in the extreme southern portion of the immense reservoir. This poster presents the history and current status of quagga mussel management in Lake Powell as well as the latest information on mussel spread in the lake.

Keywords

quagga, Lake Powell

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#### Death of the Tanoak - Sudden Oak Death Disease in Redwood National Park

What will I get out of this?

We will present information on the discovery, treatments, and expectation of a new forest treatment program to control the spread of Sudden Oak Death.

Abstract

The north coastal redwood forests had been free of the causal agent of Sudden Oak Death (SOD) disease – Phytophthora ramorum until the discovery, in late summer 2014, of two infestation sites along the banks of Redwood Creek in Redwood National Park. These sites have now exposed these forests to this disease. The species most directly threatened by SOD is the oft considered "lowly" tanoak. This majestic tree, the most common hardwood species in the northern coastal redwood biome, is now threatened because of its severe vulnerability to this disease. A keystone species, it is instrumental in providing food resources for many wildlife species, creating unique structural elements and habitat for wildlife, and is a sacred and often used resource for local tribes. We will present RNP's program to control the spread of SOD, and the park's attempt to delay widespread SOD infestation and tanoak mortality

Keywords

Disease, Tanoak, Management

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# Engaging People and Place in Research/Environmental Literacy in a Land of Private Property

What will I get out of this?

"Sense of Place" in nature is fundamental to informed citizenry. Consider Texas, 90% urban/95% private property disconnect where "field stations" can increase environmental literacy-rural/urban connections.

**Abstract** 

Given the gap between scientists and the public: "Scientists must find new ways to engage the public" - President Obama. A "sense of place" in nature is fundamental to learning, understanding and an informed citizenry. Texas Tech University Llano River Field Station in the Hill Country provides coordinated, multipurpose, multidisciplinary research, education and engagement directed toward: 1)

Watershed/Range Science, 2) Freshwater Systems, and 3) Environmental Education/Engagement – natural resources and STEM school content for students, teachers, parents and public. Stewardship initiatives involve: 1) grants for research and engagement, 2) professional scientific/educational conferences, 3) innovative partnerships (Water Symposium with Texas Public Radio). Five new projects are: 1) Watershed Planning and Education through stakeholder coordination, a protection plan with EPA's Healthy Watersheds framework, 2) partnership with the National Park Service RTCA Program, 3) a role with the newly designated US South Central Climate Science Center, 4) riparian demonstration projects, and 5) human diversity.

Keywords

environmental literacy, engagement

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#### Hillslope erosion and water quality from the Rim Fire, Sierra Nevada, CA

What will I get out of this?

Quantifying potential water quality impacts, particularly on municipal water supplies, in post-fire landscapes is critical given climate change models for increased wildfire size and intensity.

**Abstract** 

The 2013 Rim Fire generated considerable concern; responses included multi-million dollar treatment projects proposed on USFS lands near Cherry Creek, with similar actions suggested for Hetch Hetchy and Lake Eleanor. To investigate water quality and erosion, within a month after containment, two basin sites were equipped with instrumentation to record stage, turbidity, and suspended sediment. We also installed 21 sediment plots stratified by moderate (20%) to steep (50%) hillslopes and moderate to high severity burn areas. Accumulated sediment is weighed after each storm event and analyzed for physical and chemical properties. We also use repeat terrestrial LiDAR to assess topographic change and identify processes that contribute to erosion and deposition at plot- and hillslope-scale. Data are used to calculate annual sediment yield; organic carbon storage, deposition, and transport; and landscape change. Findings provide analogs for possible changes in adjacent burned areas and inform decisions in response to future fire events.

Keywords

hydrology, hillslopes, wildfire

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**7718 Poster** 

#### Who Made This Land?

What will I get out of this?

Historical records can help us understand how the landscape has come to be what it is today, if we know how to use them.

**Abstract** 

This poster will consider the variety of historical sources available to resource managers to understand past land use practices that have shaped the present environment. Specific examples will be illustrated from ongoing research in and around Pinnacles National Park in California. Documentary evidence in public records and private collections can reveal a great deal of valuable information about the ways in which our present landscapes have come into being through the successive and cumulative influences of homesteaders, miners, ranchers, public land managers, and others. The comparative value and limitations of these sources will be outlined and briefly considered, as well as where these sources can be found, and how they should be used. The complementary relationship between written records and non-documentary evidence--for example, from archeology--will also be illustrated.

Keywords

History, Land, Environment

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Comparing sea level rise and storm surge modeling methods for Northeast coastal national parks

What will I get out of this?

Understand the data needs and tradeoffs between two inundation modeling methods and sets of sea level rise scenarios. Compare accuracy needs for different applications.

**Abstract** 

The scenarios, scale and accuracy of inundation mapping for sea level rise (SLR) and storm surge projections affect their use for climate adaptation planning. We compare results from two SLR and storm surge modeling projects for coastal national parks that use similar methods, different scenarios and different data inputs. As part of a University of Rhode Island led project to get high accuracy elevations (RTK GPS) at locations of special interest within Northeast Region parks, inundation risk was estimated for three SLR scenarios. Storm surge was estimated by storm category using NOAA's SLOSH model at current sea level for mean tide. This will be compared with results from a University of Colorado Boulder led project for 117 coastal parks mapping inundation under local SLR scenarios for the years 2030, 2050, and 2100 and storm surge mapping using SLOSH for mean and high tide using best available LiDAR data.

Keywords

SLR, storm surge

Lead author / Session organizer

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Maria Caffrey, University of Colorado, Boulder

**7849** Invited Speakers

Hurricane Sandy response and recovery as a climate adaptation opportunity and challenge

What will I get out of this?

Share lessons learned from Hurricane Sandy preparation and recovery projects with a focus on climate adaptation.

**Abstract** 

The extensive recovery from Hurricane Sandy has been an opportunity to apply climate adaptation strategies and a learning process about where we are ready for change. It has also highlighted where some of our biggest information and planning needs are. This session will provide updates on recovery projects for facilities, natural and cultural resources. In advance of the storm, some parks had already begun to implement adaptation measures. Emergency preparedness plans were implemented and what was learned from them will be an important part of adapting them to future climate change. Post storm, climate adaptation was a consideration in a range of recovery, response and long term planning efforts. The lessons learned from Hurricane Sandy are being incorporated into the management of affected parks, but also need to be shared more broadly so other parks can plan to adapt to increased impacts of future storms.

Keywords

Hurricane Sandy, adaptation

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Understanding Ecological Response to Major Storm Events – Hurricane Sandy

Mary Foley, Chief of Natural Resource Stewardship and Science, Northeast Region, National Park Service

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Utilizing applied science for planning and design in rebuilding Sandy damaged infrastructure

Tim Hudson, Sandy Hurricane Recovery Manager for the Northeast Region, National Park Service

When the Waters Rise: Understanding the FFE of Historic Structures in a Post Sandy Park

Tim Hudson, Sandy Hurricane Recovery Manager for the Northeast Region, National Park Service

Assateague Island National Seashore adaptive strategies to climate change and sea level rise for facilities

Randy Hartz, Maintenance Mechanic Supervisor, Assateague Island National Seashore, NPS

The Role of Landscape Conservation Cooperatives in Implementing the Vision of Revisiting Leopold

What will I get out of this?

Attention on Revisiting Leopold has focused on WHAT and WHY. This presentation offers HOW parks can begin to implement one of the Report's key findings.

**Abstract** 

The 2013 Revisiting Leopold Report envisions a future in which "the National Park Service should become the core element of a national (and international, with collaboration) network of lands and waters..." to achieve landscape resilience to conserve resources. To help implement this vision, the National Park Service is investing in and collaborating with Landscape Conservation Cooperatives (LCCs), a conservation network established to develop landscape-level strategies for understanding and responding to climate change impacts and to help managers sustain the continent's natural and cultural resources. Each of the LCCs is currently planning for ecologically connected networks of land and water, including national park units. Collaborating with partners though LCCs, the NPS can move toward building stronger crossjurisdictional partnerships; improving park conservation potential by increasing connectivity, effective conservation area, latitudinal and elevational ranges; and benefiting from landscape-scale science provided by LCCs.

Keywords

Revisiting Leopold, Landscape

Lead author / Session organizer

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Stanton Enomoto, NPS Pacific West Region and Pacific Islands Climate Conservation Cooperative

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7753 Poster Determining Ice Cover Duration in Mountain Lakes – Measuring climate effects in park ecosystems.

What will I get out of this?

The poster will describe a low cost, easily maintained, standardized field methodology for determining ice-in/out dates at remote, high elevation lakes within National Parks.

**Abstract** 

North Coast and Cascades Network (NCCN) parks have monitored mountain lake ecosystems as part of their long term monitoring program since 2005. These lake systems are highly susceptible to anthropogenic stressors such as air pollution and climate change. The duration of seasonal ice cover on mountain lakes is a critical factor affecting lake physical, chemical and biological processes. Ice cover duration is also an excellent measure of climate variation and trend. NCCN parks have developed a low cost and easily maintained field method for determining ice-in/out dates, using a fixed array of temperature sensors which measure continual temperature at three depths. Continuous imaging from in-situ time-lapse cameras was used to interpret lake temperature data to establish criteria for standardized estimation of ice-in/out dates. Optional time-lapse movies may be shown in addition to the poster.

Keywords

**Mountain Lake Studies** 

Lead author / Session organizer

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7689 Workshop

#### Renewing North American engagement in international protected area programs

What will I get out of this?

This workshop will plan a future for North American support to the international protected area programs on World Heritage, Biosphere Reserves, Geoparks and Ramsar Sites.

**Abstract** 

North American leadership has been central to creating the most successful international protected area programs. Engagement in programs such as World Heritage, Biosphere Reserves, Ramsar and Geoparks provides both an opportunity for sharing best practice. As many of these internationally recognised areas suffer from increasing threats, we need to see increased engagement and support to international conservation efforts, including from North America. The workshop will present the latest thinking on advancing work on International Protected Areas, including benchmarking of North American performance globally. The international programs in the Parks agencies will present their work to date and current challenges. Participants will be asked to work in an interactive session to develop ideas on how North American practice and leadership can be brought to the fore in international conservation efforts. The session will bridge from the 2014 World Parks Congress to the forthcoming IUCN World Conservation Congress, Hawaii in September 2016.

Keywords

International, IUCN, UNESCO

Lead author / Session organizer

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#### The World Heritage Program: A Laboratory for Linking Nature and Culture

What will I get out of this?

Learn about the international role of the World Heritage Convention and discuss opportunities and challenges facing this treaty and the conservation of World Heritage Sites.

**Abstract** 

Through the 1972 World Heritage Convention countries around the world agree to work together to recognize and conserve our most important shared heritage – across national boundaries and across cultures. Today, there are over 1000 World Heritage Sites - and over 200 are diverse places with significant natural resource value such as the wilds of East Africa's Serengeti, the Dorset and East Devon Coast of England, and the Great Barrier Reef in Australia. This presentation will share first-hand knowledge of the implementation of this international treaty and an understanding of its challenges and potential. Currently, IUCN is advancing initiatives to better recognize the inter-connection of natural and cultural values and the bio-social character of the world's most significant landscapes and seascapes. One of these multi-disciplinary initiatives is defining new, integrated methods and practices to more fully acknowledge human rights and indigenous people and their knowledge in managing World Heritage Sites.

Keywords

international, conservation, heritage

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#### Mapping ecosystem services for National Park Service management

What will I get out of this?

Ecosystem service assessments are increasingly requested by resource managers. We present a systematic approach to assess diverse ecosystem services in support of protected areas management.

Abstract

Information about ecosystem services is increasingly requested as an input for decision making on public lands and waters. In parks and protected areas, ecosystem service flows are particularly important (i.e., how protected areas benefit surrounding communities and decisions beyond their borders impact park resources). Spatially explicit data for ecosystem services – quantified using biophysical models, and social values mapped by surveying park visitors and residents – are rarely available to support management, but could provide valuable information to balance resource protection and visitor use. The NPS and USGS are collaborating to map ecosystem services for NPS planning and management. Our results highlight areas where biophysical and social values and held by different user groups correspond and diverge. They can thus be used to identify potential management synergies and conflicts arising from management alternatives. Results can inform planning, demonstrating an approach that could be applied to other parks and protected areas.

Keywords

**Ecosystem services, economics** 

Lead author / Session organizer

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**Grey to Green: Building Urban Parks** 

What will I get out of this?

With natural spaces in high demand throughout Los Angeles, discover what it takes and hear behind-the-scenes stories about transforming single-function gray infrastructure into multiple-benefit parks.

**Abstract** 

It's undeniable that almost everyone retreats to natural settings for respite. As society becomes increasingly technologically-oriented and cities expand to become more urbanized, the gap between urban dwellers and nature continues to grow. A Los Angeles park agency will share restoration strategies for weaving 'nature' into the city fabric. Integrating ecologically-rich design with recreation and high-functioning stormwater management techniques is explored in this presentation highlighting case studies of converted underutilized vacant land into elegant multiple-benefit parks. Moving into the future, cities must encompass nature as a framework for development; interweaving 'the wild' into the urban fabric to create places that are functional and sustainable. Focus will be placed on how the conversion of vacant land into multiple-benefit natural parks has become a model for others to follow for the holistic revitalization of cities. Design processes, technical considerations, and unique landscape elements of several completed nature parks will be shared.

Keywords

Additional

multiple-benefit, parks, stormwater-management

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Our Coast, Our Future: A tool for sea-level rise planning in San Francisco Bay Area

What will I get out of this?

New spatial tool for analysis of SLR and storm surge effects on coastal and estuarine waters and species of the San Francisco Bay Area.

**Abstract** 

We developed a decision support tool called Our Coast Our Future (OCOF) to identify areas at risk to sea level rise and storm surge events in the San Francisco Bay Area. The tool already in use by coastal resource managers and planners, includes online maps and information to help understand, visualize, and anticipate vulnerabilities to sea-level rise and storms. OCOF incorporates models using the USGS Coastal Storm Modeling System, and delivers the results through an interactive website. Participation of key stakeholders has insured that the system addresses their needs. A demonstration provides an overview of products; highlights on-the-ground projects; and describes the partnership with the California King Tides Initiative to validate flood scenarios using crowdsourced photos of present-day flood events. This project is a model for how scientists and decision makers can collaboratively develop tools to address coastal climate change.

Keywords

sea-level rise modeling

Lead author / Session organizer

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Daphne Hatch (Golden Gate NRA) and

Sarah Allen (National Park Service PWR)

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7777 Workshop

#### The Role of Universities in Protected Areas Management

What will I get out of this?

How can we bolster universities' roles in managing and co-managing PA networks, educating managers, conducting research and monitoring; and engaging the public and decision makers?

**Abstract** 

How can universities expand their contribution to improving management of the world's rapidly expanding protected areas (PA) network? Far too often PAs lack the scientific information, public and decision maker support, financial resources, and management expertise needed to survive and thrive in the 21st century. This interactive session will explore how universities can expand collaboration in many aspects of PA management, including research and monitoring on biophysical and socioeconomic factors; designing and managing outreach programs to keep PAs relevant in changing societies; contributing to improved local livelihoods and resource stewardship; building capacity of a more diverse conservation workforce; serving as a source of volunteers, interns and new professionals, and directly managing PAs and specific PA management programs. The session will build on preliminary results of a discussion on this topic held during the World Parks Congress in November, 2014 in Australia.

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governance, training, stewardship

Lead author / Session organizer

**James Barborak** Co-Director, Center for Protected Area Management and Training

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Additional authors / organizers

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**7696** Panel Discussion

The Indigenous Cultural Landscape Approach in the Chesapeake Bay Watershed: Update and Next Steps

What will I get out of this?

Learn how the Indigenous Cultural Landscape concept has been applied in the Chesapeake Bay watershed and what might be in store for the future.

**Abstract** 

This moderated panel discussion will provide an update on the Indigenous Cultural Landscape approach to the development and planning of the Captain John Smith Chesapeake National Historic Trail, managed by the National Park Service's Chesapeake Bay Office. The Indigenous Cultural Landscape views large landscapes from the perspective of American Indian nations at the time of their first contact with Europeans. Such landscapes comprise the cultural and natural resources and relationships that would have supported the historic lifestyles and settlement patterns of Native groups in their totality. The concept presents the indigenous view of one's homeland on a regional rather than site based scale. The panel will discuss these ideas, the challenges of implementation on the ground, and how the idea might be coordinated with other traditional ideas of cultural landscapes. Audience questions and discussion will be welcomed.

Keywords

indigenous, cultural, landscapes

Lead author / Session organizer Brenda Barrett

Moderator

Additional authors / organizers

Brenda Barrett, Editor, Living Landscape Observer

Brenda Barrett, Editor, Living Landscape Observer

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are

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Applying the Indigenous Cultural Landscape Approach in the Nanjemoy Peninsula of Maryland Dr. Julia A. King, Associate Professor, St. Mary's College of Maryland

Thoughts on the Indigenous Cultural landscape and the National Register Landscape Initiative

Barbara Wyatt, National Register Program, National Park Service

#### **Geotemporal Values of Coastal Geomorphological Maps**

What will I get out of this?

Attendees will gain an understanding of the concept behind the creation of geomorphological maps in the context of an evolving coastal system.

**Abstract** 

A categorization of surface features has been developed for Fire Island National Seashore, Assateague Island National Seashore, and Gateway National Recreation Area to track the evolution of the geomorphology within these coastal parks. Using 2010 and 2011 orthophotographs, LiDAR data sets, vegetation and soils data, geomorphological units were mapped using ArcGIS at 1:12000 scale. The legend categories incorporate the spatial and temporal evolution of a natural coastal system influenced by a variety of anthropogenic modifications. The geomorphological map for each park follows a tripartite depiction of information: landforms, developmental processes, and phases in spatial evolution. Initial maps preceded Superstorm Sandy (October 2012). They were re-created using 2012 orthophoto and LiDAR datasets to portray the post-storm morphologies. These post-Sandy geomorphological maps offer an insight into issues of natural resource management in an evolving environment and present an opportunity to quantify geotemporal changes.

Keywords

coastal, geomorphology, maps

Lead author / Session organizer

#### Irina Beal

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#### Parks and Urban Cultural Planning: converging issues and strategies

What will I get out of this?

Learn about shared concerns between Parks and cities. Compare e.g. strategies used in Downtown Eastside Vancouver with Parks Canada and Aboriginal parks co-management.

**Abstract** 

Keywords

Parks, Cities, similarities

This paper seeks to establish dialogue between those concerned with Parks and their futures and those working to make cities more liveable and sustainable. Urban cultural policy of the last twenty years incorporates environmental concerns such as urban greenspace, the cultural, public health, and civic value of parks, walkable neighbourhoods and amenities such as community gardens. Parks advocates debate tourism, heritage and resource extraction versus pristine environments. But the presence of these parallel concerns in parks and cities is not generally acknowledged. Both Parks and towns and cities face the pressures of resource extraction and industry, transportation corridors, residential development and gentrification, land claims including those of First Nations, tourism, and more. With examples from the Downtown Eastside of Vancouver, new BC Parks use policy, and issues in Canada's national parks, this paper will suggest the potential for knowledge exchange between Parks and cities and those advocating for them.

Lead author /	Alison Beale Professor
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Additional	
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#### Restoration of the Mariposa Grove of Giant Sequoias

What will I get out of this?

The presentation provides insight into restoration of a national recognized icon that is both a natural and cultural resource.

**Abstract** 

The Yosemite Grant of 1864 protected the Yosemite Valley and the Mariposa "Big Tree Grove" for future generations. This enabling legislation is considered by many to signal the birth of the conservation movement. A hundred years later, the trees of the giant sequoia grove "that started it all" continue to awe visitors with their immense and serene presence. In these hundred years, the grove has also accumulated a clutter of human impacts that detracts from visitor experience and possibly compromises the grove's future vigor. A centennial restoration project is underway that focuses on reducing human infrastructure and restoring natural water flow in order to enhance the resilience of this grove in an increasingly dry future. This project improves both the health of the grove and visitor experience. This paper provides insight into restoration of a national recognized icon that is both a natural and cultural resource.

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Yosemite, sequoias, restoration

Lead author / Session organizer **Sue Beatty** Restoration Ecologist

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Additional authors / organizers

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#### Technical Assistance for NPS Units Vulnerable to Sea Level Rise and Lake Level Variation

What will I get out of this?

This paper will provide information on a new program that will implement sea level monitoring instruments to parks identified as vulnerable to sea level rise.

**Abstract** 

Keywords

sea, monitoring, coastal

This paper will discuss examples of how issues of sea level rise, coastal change, and lake level variation in our NPS coastal and Great Lakes units can be addressed. A new program is currently being developed in the Water Resource Division's Ocean and Coastal Resources Branch of the National Park Service to supplement on-going sea level work throughout the Service. This program will provide technical assistance to parks that are particularly vulnerable to sea level rise and shoreline change. It will utilize geodetic survey data such as GPS, Airborne LIDAR, and Terrestrial LIDAR to develop highly accurate digital elevation models of changing coastal park shorelines. A sea level monitoring program is also being coordinated nationally. This program will propose installation of a series of both temporary and permanent tide gauge stations in critically vulnerable and identified coastal parks, with plans to integrate with NOAA's National Water Level Observation Network.

Lead author/	Lynda Bell Sea Level Specialist
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7995
Invited Speakers

#### **Enjoy the View by Daylight and Starlight**

What will I get out of this?

This session explores protection of iconic scenic vistas and premier night sky viewing opportunities through cross-boundary collaboration and policies that reduce haze and light pollution.

**Abstract** 

In many national parks and monuments, visitors anticipate clear views of iconic landscape features as well as spectacular stargazing opportunities at night. However, these scenic resources are often diminished by air and light pollution, much of which originates outside park boundaries. This session explores regional collaboration and national regulations that protect daytime and nighttime visual resources, and gives examples of park policies that reduce light pollution on a local scale. The first step in protection is understanding the resources at risk, so we also discuss scenic vista evaluation, anthropogenic light assessment, and long-term monitoring of the aerosols which impair visibility. Two NPS Calls to Action are highlighted: Enjoy the View, aimed at protecting clean air and treasured views through resource assessment and cooperative conservation; and Starry, Starry Night, which established the Colorado Plateau Dark Sky Cooperative in collaboration with other federal agencies, partners, and local communities.

Keywords

Visibility, Night-Sky, Collaboration

Lead author / Session organizer Andrea Blakesley Environmental Specialist

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Additional authors / organizers

Melanie Peters, Natural Resource Specialist, NPS Air Resources Division

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here Identifying important scenic views – where they are and why they are important

Mark Meyer, Visual Resource Specialist, NPS Air Resources Division

Protecting natural lightscapes in park developed zones with fully sustainable outdoor lighting management

Laura Williams, Night Skies Inventory Coordinator, Grand Canyon National Park

Clearing the Haze: Forty years of research and policy to improve daytime and nighttime visibility

Bret Schichtel, Physical Scientist, NPS Air Resources Division

Landscape-scale viewshed conservation

Laura Rotegard, Superintendent, Horace Albright Training Center

A Cosmic Odyssey: Creating a New Approach to Sky Designations

Eathan McIntyre, Physical Scientist, Grand Canyon-Parashant National Monument

**8017**Poster

#### Night sky-friendly outdoor lighting in the land of the midnight sun

What will I get out of this?

This poster illustrates universal design principles for night sky-friendly outdoor lighting, as applied in a recent retrofit project in Denali National Park.

**Abstract** 

As dark night skies become more difficult to find in urban and suburban environments, many people seek stargazing opportunities in their national parks. Unfortunately, parks are increasingly affected by light pollution from external and internal sources. Lighting technology continues to advance rapidly, providing an overwhelming array of outdoor lighting choices, and not all options are equally night sky-friendly. Denali National Park managers are retrofitting outdoor light fixtures in developed areas of the park that are accessible during wintertime, when the midnight sun gives way to long, dark, aurora-filled nights. While design choices factor in several local considerations, there are a few universal outdoor lighting design principles that apply to every situation where outdoor lighting is being considered. Equally as important as full-cutoff shielding, safe, energy-efficient outdoor lighting should be yellowish rather than bluish, not overly bright, only illuminated when needed, and should not spill over into unintended areas.

Keywords

Night Sky, Outdoor-Lighting

Lead author / Session organizer

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Additional authors / organizers

Chad Moore, NPS Natural Sounds & Night Skies Division

Hormones, Pharmaceuticals and other Contaminants of Emerging Concern in Water and Sediment of the USNPS

What will I get out of this?

An overview of coordinated USGS Toxics assessments of endocrine disrupting chemical risk in multiple park units (CONG, IDNU, NCPN, ROMO, etc), across the nation.

**Abstract** 

Contaminants of emerging concern (CEC), in general, and endocrine disrupting chemicals (EDC), in particular, have been identified as USNPS environmental priorities. EDC threaten the reproductive success and long-term survival of sensitive aquatic populations. The USGS Toxic Substances Hydrology Program's Emerging Contaminants Project is working with the USNPS and the USEPA to assess EDC risk in individual Parks and in Park Monitoring Networks. Water samples are analyzed for total estrogenic activity (BLYES), 19 hormones, 110 pharmaceutical compounds, and 69 wastewater indicator compounds. Sediment samples are analyzed for 19 hormones and 57 wastewater indicator compounds. Microcosm biodegradation experiments are conducted EDC model compounds to assess environmental persistence in a range of park settings. Results from multiple park systems indicate a wide range of CEC, including EDC, are present in water and sediment in high visitation locations as well as in more remote locations, suggesting multiple contaminant sources and significant EDC risk.

Keywords

endocrine disruption, contaminants

Lead author / Session organizer

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## From Research to Engagement: Case Studies of Scientific Research Resulting in Conservation Engagement Southern California

What will I get out of this?

Examples in research and public engagement from wildlife, plants, policy/law, fund/friend-raising, citizen science, and climate change are relevant to parks engaging the public via research

**Abstract** 

In this case study I will present three very different examples of how park research has led directly to conservation actions. In the first example, I will describe how park research identified that public use of anti-coagulant rodenticides led to deaths of local carnivores from both direct poisoning as well as indirect exacerbation of a mange epidemic. This research resulted in local political action by a number of municipalities to restrict the use of these chemicals. In the second example I will discuss our citizen science plant phenology monitoring and how their results are providing the park with climate change messages for the public. Finally I will discuss our partnership with our friends group and the National Wildlife Federation to use our research on P-22, the Griffith Park mountain lion, to raise awareness of wildlife connectivity needs throughout the region.

Keywords

research, public engagement,

Lead author / Session organizer

**Christy Brigham** Chief of Planning, Science and Resource Management

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Additional authors / organizers

Dr. Seth Riley is the wildlife biologist for the park

Jeff Sikich is the mountain lion biologist for the park.

Crystal Anderson is a park partner leading our phenology monitoring efforts.

Beth Pratt is the California representative for the National Wildlife Federation

Art Eck is the Executive Director of the Santa Monica Mountains Fund

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7825 **Invited Speakers**  Ride Respectfully: using motorcycle outreach to protect natural sounds in national parks

What will I get out of this?

The issue of motorcycle noise in parks is an ongoing issue across all units. This session describes a proactive approach to resource protection through outreach.

**Abstract** 

Together, the predominantly quiet background sound levels in national parks and the unique properties of motorcycle noise present a difficult challenge for park management and resource protection. Over the past decade, complaints about motorcycle noise in parks have increased considerably. Often, the noise generated by motorcycles can be heard more than 10 miles from a road, so even a single vehicle can be significant. To address the issue of motorized recreation in parks, the Natural Sounds and Night Skies Division has initiated an outreach campaign reminding motorcyclists to "Ride Respectfully." Over the past two years, the Ride Respectfully campaign has been showcased in four parks, including Rocky Mountain National Park, Crater Lake National Park, Glacier National Park, and Devils Tower National Monument. Presentations at this session will discuss the background of the motorcycle noise issue, principles of this outreach campaign, technological solutions developed specifically for the project, and lessons learned.

Keywords

Noise, motorcycle, resource

Lead author / Session organizer **Emma Brown** Acoustical Resource Specialist

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Additional authors / organizers Lochen Wood Christopher Garsha Scott McFarland Frank Turina

Program Mgr, Policy Planning and Compliance, NSNSD/ Introduction to motorcycle outreach project Frank Turina

If this is a session of **Invited Speakers** or a Panel Discussion, additional

> speakers/panelists and titles of their

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**Environmental Protection Specialist/ Outreach implementation** Lochen Wood

Acoustical Technician/ Engineering solutions

Christopher Garsha or Scott McFarland

Chief of Resource Management, Devils Tower NM/ Park perspective

Renee Ohms

Acoustical Resource Specialist/ Lessons learned and next steps

Emma Brown

7593 Poster

#### **Forest Centennial Comparisons and Forest Threats**

What will I get out of this?

View Park specific comparisons of forest health changes for the Centennial, focusing on forest threats from insects or disease computed for the Park and environs.

**Abstract** 

"Historical comparisons of forest conditions from 1916 to 2016 illuminate changes in forest conditions such as density and canopy closure. These conditions and the modeling efforts of the USDA Forest Service on insects and disease damage help to inform Park managers on potential threats and levels of damage that may occur in their Park unit. Other results of our NPS/USFS partnership and joint development of a Forest Health Advisory System (http://foresthealth.fs.usda.gov/fhas) are highlighted. Two case studies at Hot Springs, Arkansas and Hawaii Volcanoes, HI demonstrate the 1916-2016 changes and the modeled forest losses from insects and disease in the Park and environs. The Forest Health Advisory System can enable any Park to run the models in their area to assess potential threats, and prioritize areas of highest potential loss or damage. Technical points of contact and assistance are available."

Keywords

forest-health, insects, disease

Lead author / Session organizer

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Additional authors / organizers

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- 2. Peter Budde (NRSS), Biology Restoration Adaptation Branch Chief; office phone (970) 225-3559; Email: peter\_budde@nps. gov

8121
Panel Discussion

Where am I going and how do I get there? Honest conversations about conservation careers

What will I get out of this?

Student attendees will hear honest advice on how to find federal, academic, and non-profit jobs related to parks and protected areas, environmental studies/science, etc.

**Abstract** 

This session is an opportunity for graduate students to hear about different conservation careers, such as jobs with the National Park Service, other land management agencies, non-profit organizations, universities, and colleges. Representatives from each of these fields will give students honest advice about finding and securing these different types of jobs. Students will learn some of the pros and cons of working in these different sectors, have opportunities to ask career specialists questions in an informal setting, and have opportunities to network with potential future employers. Students will leave the session more knowledgeable about different conservation career paths, with new strategies for being more competitive in their respective job markets and new connections with representatives for future mentoring. The session will consist of short presentations and roundtable discussions. After the session, representatives and students will be invited to continue their conversations at a nearby restaurant.

Matthew B	rowning Garduate Student Rep	presentative to GWS Boar	rd	
Virginia Tecl	matt.mutel.browning@gmail.c	com		
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7820 Panel Discussion

Using advanced technology for visitor use management: Debating the issues

What will I get out of this?

Audience members will leave with deeper understandings of the ethical, political, economic, methodological, and practical issues associated with advanced technology applications for visitor use management.

**Abstract** 

Using advanced technology for visitor use management is burgeoning. Researchers and managers now use a) GPS tracking, b) unmanned aerial video (drones), c) time-lapsed photography, and d) blue-tooth phone applications to evaluate visitor travel patterns, congestion, human-wildlife interactions, ecological-recreation impacts, timing of use, and infrastructure capacity. Although managers use this information for defensible decisions, visitors may desire solitude, technology absent experiences, and freedom without others observing. The appropriateness of advanced technology for visitor management is influenced by space, time, agency type, political environment, resources, and visitor characteristics. Alarmingly, there is a lack of formal and documented discourse about these considerations, which this panel will address. The panel is intentionally balanced with agency personnel, wilderness purists, technology centrists, and technology advocates, all familiar with the applications and issues. Each panel member will provide a brief position statement and then engage in a thoughtful debate addressing questions from the moderator and audience.

Keywords

visitor use management

Lead author / Session organizer **Matthew Brownlee** Professor

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Additional authors / organizers

I used this space to include Panelist #6. However, panelist #6 is not a co-organizer.

Invited speaker/Panelist #6: Dan Dustin

Title of invited speaker/panelist #6's presentation: Protecting wilderness values from the onslaught of advancing research technology

Benefits and impacts of technology development and application in protected area planning, management, and Tom Fish

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Out of focus: Complexities of visitor use monitoring with technology

Alan Watson

Striking a balance between being a late adopter of technology and an obsolete laggard

Jeff Hallo

A pragmatic perspective on technology use for social science research in parks

Nathan Reigner

Elegant simplicity: Technologies untrammeling protected natural areas

Logan Park

#### Seed collection as the basis of restoration strategy

What will I get out of this?

Systematic seed collection approaches that broadly sample genetic diversity are critical for effective park restoration strategies.

**Abstract** 

The collection of native seed supporting restoration efforts is of increasing importance as numerous ecological stressors impact protected areas. The Southeast Arizona Group, in cooperation with the Sonoran Desert Network and the Southwest Exotic Plant Management Team, initiated a systematic effort to collect seed on three NPS units in Southeastern Arizona. This project report examines the effort to systematically sample plant genetic resources found in these three park units. The findings include considerations in developing seed collection protocols and sampling techniques, issues surrounding NPS participation in other national seed collection efforts, and the need to develop collaborations across agency and other land management boundaries. Conservation of park genetic resources is of critical importance in the era of climate change and being able to collect seed in the broadest possible manner allows managers the best range of options to conserve and restore park plant resources for future generations.

Keywords

Restoration, seed collection

Lead author / Session organizer Steve Buckley Botanist

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Jason Meteljak, Chief of Resources, Southeast Arizona Parks

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7736
Sharing Circle

Re- Envisioning the Application of the National Environmental Policy Act (NEPA) within Land Management Agencies

What will I get out of this?

This session challenges members to re-evaluate their own perceptions of NEPA by examining both successful and unsuccessful methods for implementing NEPA requirements in protected areas

**Abstract** 

Land management agencies, particularly those in western states, often face strict scrutiny and aggressive legal challenges when implementing requirements associated with the NEPA process. This Challenge Session will seek to evaluate the effectiveness of new solutions being implemented by agency leaders who are tasked with fulfilling the laws statutory and public perception requirements. We will investigate what is working and what isn't and discuss new, innovative and proactive solutions towards meeting our responsibilities as public stewards while avoiding excessive litigation or negative public perception. Participants interested in this controversial conversation are encouraged to bring examples of their own problem solving resulting in successful resolution and ideas for garnering broader support, both internal and external, for realizing the goals of the NEPA process. This facilitated discussion will include participants from federal agencies, academia, and private industry.

Keywords

NEPA, legal requirements

Lead author / Session organizer

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Tom Flanagan, Environmental Quality Division, NPS Natural Resource Stewardship and Science

Dave Jacob, NEPA Technical Specialist, NPS Natural Resource Stewardship and Science

Integrating Knowledge of Cold Air Pooling Dynamics into Climate Change Adaptation Strategies

What will I get out of this?

Cold-Air-Pools influence the physical components of climate refugia, such as wet meadows/riparian habitats, however, the effects of climate change on CAP dynamics is needed

**Abstract** 

Results of a five-year study of the physical dynamics of cold air pooling and consideration of the potential role of cold air pools (CAPs) in maintaining climate change. CAPs are temperature inversions that occur in confined terrain where cold, dense air becomes trapped and concentrated, resulting in cooler and moister conditions as compared to the surrounding, often higher elevation, area. Preliminary results of the study indicate that CAP formation is influenced by time of day, season, weather patterns, and possibly influenced by climatic conditions such as drought. Research is in progress to better understand CAP dynamics and whether this process will continue to provide cooler and moister conditions or if CAP events will decrease in frequency or stop occurring altogether. This knowledge is vital for the development of effective climate change adaptation strategies that focus on refugia at DEPO for conservation and resource management, and transferable knowledge and educational engagement.

Keywords

cold-air-pools adaptation refugia

Lead author / Session organizer

**Monica Buhler** Monica Buhler, Ecologist and Resource Education Specialist, Devils Postpile

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Monica Buhlera, Deanna M. Dulena, Dan Cayanb, Mary Tyreec, Catherine S. Fonga and Andrew L.T. Osbornea

a: NPS Devils Postpile National Monument, Mammoth Lakes, CA; b: Scripps Institute of Oceanography, La Jolla, CA; c: UCSD, San Diego, CA

The Impact of Non-native Crayfish on a Unique Population of Salamander in Crater Lake, Oregon

What will I get out of this?

This poster describes the on-going displacement of a native salamander by an invasive crayfish and associated mechanisms of inter-specific competition and predation.

**Abstract** 

Crayfish were introduced to Crater Lake in 1915 and are displacing a proposed subspecies of rough-skinned newt, the Mazama newt. Observations of declining newt distribution and increasing crayfish abundance through the 1900s led us to investigate current distribution, abundance, and interactions between newts and crayfish. Crayfish have expanded in distribution to occupy approximately 69% of the lakeshore. Newts remain in areas that crayfish have yet to invade but are almost entirely absent in areas occupied by crayfish. Benthic invertebrate studies and stable isotopic analysis of the food web indicate crayfish and newts compete for food resources and are primarily predacious. Behavioral experiments conducted with newts and crayfish reveal that crayfish prey on newts and physically displace newts from habitat. Further crayfish expansion will likely cause additional declines in newt abundance and distribution and could lead to extinction of the Mazama newt.

Keywords

Invasive crayfish

Lead author / Session organizer Mark Buktenica Aquatic Ecologist

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Additional authors / organizers

S. F. Girdner, A.M. Ray, J. Umek, and D.K. Hering

#### **Bat Studies in Alaska's National Parks**

What will I get out of this?

This paper outlines the local studies that are being used to understand the broader distribution, habitat types, and migration patterns of Alaska bats.

**Abstract** 

Very little is known about the bats of Alaska, their abundance, distribution, and habitat. Bats are seen in the night skies above the parks and been found roosting in abandoned buildings and other structures, but we do not know whether or not they are year-round residents or if they migrate to the coasts and southward for the winter. Knowing their range is vital for determining how susceptible they may be to interaction with White Nose Syndrome infected bats from farther south. Researchers are conducting long-term acoustic monitoring, analyzing genetic material to identify bat species and analyzing guano to get information on bat diet.

Keywords

Bats, habitat, monitoring

Lead author / Session organizer Paul Burger Hydrologist

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### **Braided Stream Dynamics in Alaska's National Parks**

What will I get out of this?

This paper describes several studies that have been done to better understand braided stream systems and the effects of these changing systems on park infrastructure.

**Abstract** 

The dynamics of braided streams in many of Alaska's National Parks have widespread effects on park infrastructure, including flooding, erosion, and the distribution of aggregate materials. Streamflow in these systems is difficult to measure and understanding the forces driving channel migration, aggradation, and erosion is complex. Shifting climate, glacial ice loss, and isostatic rebound further complicate the long-term story of change. Parks have undertaken a wide range of studies to increase our understanding of these systems ranging from detailed geomorphic studies involving repeat LIDAR measurements to using timelapse photography to measure fluctuations in streamflow. These studies have broader applications to other parks and in other areas where the dyamics of braided stream systems are important.

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geomorphology, braided-streams, infrastructure

Lead author / Session organizer Paul Burger Hydrologist

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# Abandoned Mineral Lands in the National Park System—Comprehensive Inventory and Assessment

What will I get out of this?

Abandoned mineral development sites exist in 133 parks. Aside from natural resource damage and safety issues, these sites are valuable cultural resources and wildlife refuges.

**Abstract** 

maine AMII westewation

Mining and other mineral resource development have occurred in many areas throughout the United States that are now units of the National Park System. Many have serious safety issues and resource impacts. Commodities extracted include precious and base metals such as gold, silver, platinum, lead, copper, and zinc; industrial minerals such as clays, limestone, borates, and talc; energy commodities including uranium, coal, oil, and gas; building stone; and aggregate materials such as sand and gravel. NPS conducted a Systemwide inventory and assessment of its AML sites from 2010 through 2013, identifying 37,050 AML features in 133 NPS units. The majority of features (81%) are located in the Pacific West Region's southern California desert parks, but all seven NPS regions have AML features. Of the 37,050 features inventoried, 3,814 (10.3%) in 76 NPS units are in need of remedial action at a cost of \$141 million over 12 years.

illine, AML, restoration		
John Burghardt Geologist		
NPS-WASO Geologic Resources Division John_Burghardt@nps.gov		

7573 Invited Speakers

Partnership case studies at parks and protected areas from an international perspective

What will I get out of this?

Discussion will be valuable as we discuss various types of partnerships used in several international settings, including cooperatives, NGOs, governmental, and sponsorships.

**Abstract** 

Partnerships are now a common method of sustaining parks and protected areas worldwide. Partnership, however, can be multi-faceted and complex, and can vary greatly in parks and protected areas around the world. This discussion will delve into the various methods of partnering through the use of five case studies from around the world. The audience will have the opportunity to learn about successful partnerships from the five invited speakers. In turn, audience members will have the opportunity to discuss partnership efforts that have worked (and not worked) for them. The case studies include developed outdoor recreation areas (Vienna, Austria; Vietnam) as well as rural settings (Amazonian Brazil, northeastern Brazil) and a unique perspective or partnering from an NGO (Germany). Outcomes will be understanding best practices and benchmarking of partnership methodologies, as well as an understanding of the role in partnerships in developing sustainable park and protected areas.

Keywords

partnerships, management

Lead author / Session organizer **Robert C. Burns** Associate Professor

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Additional authors / organizers

New solutions for an urban national park under use pressure: A stakeholder-driven planning approach (Austria)

Arne Arnberger, Associate Professor, BOKU - University of Natural Resources and Life Sciences, Vienna

Engaging corporate businesses in protected area management and conservation projects (Germany)

Eick von Ruschkowski; Department Head for Nature Conservation and Environmental Policy, Nature and Biodiversity

Fernando de Noronha National Marine Park): A Variety of Partnerships (Brazil)

Jasmine Cardozo Moreira, Chefe do Departamento de Turismo, Universidade Estadual de Ponta Grossa, Ponta Grossa - Paraná -

NPS International Partnering and Collaboration (Vietnam) (working title)

Thomas E. Fish, National Coordinator, Cooperative Ecosystem Studies Units Network, U.S. Department of the Interior, Main

Developing a Cooperative Partnership on the Tapajos National Forest (Brazil)

Robert C. Burns, Recreation, Parks and Tourism Program West Virginia University, 6125 Percival Hall, West Virginia University,

# Trail Assessment in Support of Sustainable Use Planning for Lake Raleigh Woods

What will I get out of this?

We present a trail assessment project that characterizes trail proliferation and conditions in a university-owned natural area in support of ongoing sustainable use planning efforts.

**Abstract** 

This case study was conducted at Lake Raleigh Woods in Raleigh, North Carolina. This university-owned protected natural area is open and accessed by the university community as well as the public. Past and current recreation exists on unofficial trail networks with little management and maintenance. We applied trail assessment methods to map all present trails and assessed the conditions of selected trail segments. We looked at trail width, density, and depth to evaluate erosion characteristics that potentially degrade surrounding vegetation, soil, and water quality. The assessment data have been reported to the university in support of an ongoing plan for the sustainable use of Lake Raleigh Woods.

Keywords

recreation, trail, assessment

Lead author / Session organizer

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Additional authors / organizers

Mirza Halim: NCSU Graduate Student

Shaun Fisher: NCSU Graduate Student

Yu-Fai Leung: NCSU Professor

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Acoustic Map and Illustrative Recordings: Grand Teton and Yellowstone National Parks

What will I get out of this?

Presenting a novel approach to share soundscape information from specific areas of the parks.

Abstract

National Parks provide an acoustic environment rich with natural sounds. Visitors to these areas can experience an expansive awakening to and perception of a complex and variable natural soundscape. Long-term acoustical recordings document the spatial and temporal qualities of this complex environment. Demonstrating these soundscapes has been primarily confined to short recordings of particular species vocalizations. In an effort to expand the interpretation of park soundscapes and engage potential visitors, an interactive web-based acoustic mapping project is under development at Grand Teton and Yellowstone national parks. Hundreds of thousands of hours of continuous recordings have been collected from many of locations. Several minute-long illustrative recordings from these sites along with photographs, and sound level and sound source summaries provide an enjoyable and informative experience, but also provide potential visitors the ability to choose areas of the park to explore further based on expected sounds of those areas.

Keywords

Soundscapes, mapping, recordings

Lead author / Session organizer **Shan Burson** Bioacoustic Ecologist

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Additional authors / organizers

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From Ice to Sand: The untold story of the great White Sands

What will I get out of this?

Overview on one of the largest concentration fossilized prints, and the techniques and methodologies that were used to rapidly document these very fragile resources.

**Abstract** 

In the last several years, thousands of fossilized prints have been found throughout the White Sands (WHSA), clasifing the area as a Mega Track Site. The fossilized tracks (ichnofossils) at WHSA are thought to represent one of the largest concentrations of Cenozoic-era tracks within the US. These tracks are preserved in Late Pleistocene playa lake and lake margin deposits. The tracks are associated with several Late Pleistocene megafauna including prints with morphologies interpreted as proboscidean (mammothlike), camelid (camel like) and felid (cat-like). Because the tracks are composed of soft gypsum soils, once they become exposed they often disappear in only a few years. To rapidly acquire data many techniques have been implemented to gain precise measurements of this ephemeral resource. Techniques include: Milar traces of tracks, photogrammetry, ground and air laser scanning, ground penetrating radar, soil stratigraphy, electromagnetic induction, and time laps photography.

Keywords

Pleistocene, ichnofossils, paleontology

Lead author / Session organizer **David Bustos** Chief of Resources Management

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David W. Love, New Mexico Bureau of Geology and Mineral Resources, New Mexico Tech, Socorro, NM

Vincent L. Santucci, National Park Service, Geologic Resources Division, Washington, DC

Allison S. Harvey, National Park Service, White Sands National Monument, Alamogordo, NM

Patrick J. Martinez, National Park Service, White Sands National Monument, Alamogordo, NM

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White Sands and Cuatrociénegas, Gypsum Islands in a Sea of Desert: A Model for Collaboration

What will I get out of this?

A Model for Successful Sister Park Collaboration

**Abstract** 

White Sands National Monument and Area de Protección de Flora y Fauna Cuatrociénegas (Mexico) were designated as "sister parks" in 2006. Since that time, there have been remarkable achievements in the development of this young partnership. Specifically, (U.S.) project to inventory endemic species has been completed, a shared groundwater study has been initiated, a wetland inventory and study is planned to start in the near future, a Cuatrociénegas employee was detailed to White Sands, vital sign monitoring protocols have been shared, and interpretive and educational material have been developed and exchanged. Additional future collaborative activities are also planned. This presentation will review the accomplishments of the sister park partnership and the strategies used to insure that this partnership provides tangible benefits to both protected areas, which may be applied to other sister park partnerships.

Keywords

Gypsum, Water, Sisters

Lead author / Session organizer **David Bustos** Resource Program Manager

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Additional authors / organizers

Juan Carlos Ibarra Flores, Protection Area Wildlife Cuatrociénegas, Cuatro Cienegas, Coahuila, Mexico

7853
Panel Discussion

#### Catalyzing Innovation in the Parks

What will I get out of this?

This session delivers specific tools, strategies, and lessons learned in the quest to catalyze visionary innovation initiatives for park planning, management, and design.

**Abstract** 

America's parks are constantly changing. And yet too often their tools for facing today's challenges—shifting demographics, climate change, new technologies, and economic constraints—remain rooted in the past. This session explores the power of innovation processes to catalyze fresh ideas for twenty-first century parks. Innovation instruments such as competitions, design challenges, and other initiatives ask bold questions that bring new perspectives and creative energy to rethinking parks' role as cultural destinations, the experiences of their visitors, and the sustainability of their infrastructure. This session shows how innovation tools can infuse park design and management with contemporary ideas and practices; rethink research agendas; encourage multidisciplinary collaboration; and forge new partnerships with agencies, community groups, nonprofits, and universities. Case studies including the Parks for the People competition (2012), National Parks Now (2014), and Designing the Parks offer lessons learned for park planners, designers, and managers in search of innovation and inspiration.

Keywords

innovation, design, transformation

Lead author / Session organizer **Jeff Byles** Partnership Director

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Additional authors / organizers

#### So What Is Public Realm Innovation, Anyway?

Jeff Byles, Session Organizer

Title TBA

Shaun Eyring, Chief, Resource Planning and Compliance, Northeast Region, NPS

Parks for All Forever: Engaging the Community in Park Planning and Design

Catherine Barner, Vice President, Projects and Stewardship, Golden Gate National Parks Conservancy

Adapting With Success: New Ideas for Crissy Field and The Presidio

Kevin Conger, Principal, CMG Landscape Architecture

7903 Invited Speakers

### Visitor Use Management Planning

What will I get out of this?

In Visitor Use Management, interagency collaborations critically inform quality planning efforts; this session will discuss successful collaborations in planning with social sciences and commercial services.

**Abstract** 

Federal land managers strive to provide maximum opportunities and benefits from public use and access, while at the same time ensuring that natural and cultural resources are protected. To meet this need, an Interagency Visitor Use Management Council was chartered by the NPS, USFS, BLM, USFWS, USACE, and NOAA. This session will include an update on the council's activities, and how that work is influencing NPS's current approach to visitor use management planning. We'll also discuss a recently initiated visitor use management plan at Delaware Water Gap NRA to highlight the NPS's current approach. Additionally, this session includes an overview on data needs for visitor use management, and new initiatives by the NPS Social Science Program to support those needs. Finally, with participation from the Park Planning and Special Studies Program, speakers will also discuss how visitor use management planning and commercial services are interrelated.

Keywords

NPS, Visitor-Use, Planning

Lead author / Session organizer Kerri Cahill Visitor Use Management Team Lead

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Additional authors / organizers

Updates from the Interagency Visitor Use Management Council

Kerri Cahill

Visitor Use Management Planning in Action: Delaware Water Gap NRA

Rachel Collins

Data Needs for Visitor Use Management: New Initiatives

Bret Meldrum

Integrating Visitor Use Management and Commercial Services Planning

Jennifer Stein

Integrating Visitor Use Management and Commercial Services Planning

Wendy Berhman

# A Preliminary Spatial Analysis of Archaeological Sites in Isle Royale National Park

What will I get out of this?

Audience will learn about a predictive model for archaeological sites at Isle Royale National Park. Project enhances management efforts and highlights value of archaeological resources.

**Abstract** 

Isle Royale National Park (ISRO), located in Lake Superior off the coast of Michigan's Keweenaw Peninsula, is well-known as a National Wilderness Area and for its long-term environmental studies of wolf and moose populations. Lesser-known but important resources include the historic and prehistoric archaeology of the island, including habitation and copper mining sites associated with the Woodland and Archaic periods. Management of these sites is challenging, due to the time-intensity of traditional archaeological survey, the difficult terrain of the island, and lack of adequate resources and staffing. This poster demonstrates preliminary information relating to efforts to build and test a GIS predictive model for locating, recording, and testing prehistoric archaeological sites within portions of Isle Royale National Park. Desired outcomes include supporting Park efforts to manage archaeological resources, finessing the use of predictive modeling for ISRO, and generating data that enhances an archaeological understanding of the island's prehistoric populations.

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ISRO, Archaeology, GIS

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Additional authors / organizers

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### Permafrost Thawing and Landslides - Denali is Slip Slidin' Away

What will I get out of this?

Audience will learn about rate that climate change is thawing permafrost, how thawing destabilizes the landscape, and management concerns associated with this destabilization.

**Abstract** 

Climate change disproportionally affects high-latitude areas. Climate models for Denali National Park and Preserve (DENA) predict a further increase in temperature of ~1°C every 20 years and an increase in the amount and intensity of rainfall. The 2014 water year was one of the wettest and stormiest on record. Modeling based on over 2,200 soil pits estimates DENA was ~75% covered in permafrost during the 1950s, ~50% during the 2000s, and will be ~5% covered in permafrost in the 2050s. These changes destabilize slopes and cause a wide variety of landslides and subsequent ecosystem changes. DENA experienced an abnormal number of landslides in water year 2014; many impacted park infrastructure. Because of these model predictions and first-hand experiences, the park is now launching a full landslide risk assessment for the Denali Park Road.

Keywords

Denali, permafrost, landslide

Lead author / Session organizer

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Additional authors / organizers

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Alina Motschmann - Denali National Park and Preserve

Andrew Collins - Denali National Park and Preserve

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### Parks Canada's Built Heritage – A vibrant future for our past

What will I get out of this?

Participants will gain a better understanding of Parks Canada's portfolio of heritage places, its current challenges and upcoming opportunities.

**Abstract** 

The presentation will start with the story of the creation of Parks Canada's system of National Historic Sites. A few examples of national historic sites will be illustrated including Quebec Fortifications, Carleton Martello Tower, Bellevue House, Grosse-Ile and the Iris Memorial and Saoyu-Ehdacho. The presentation will also discuss Parks Canada's challenge to maintain its built heritage assets in good condition and how this lead to a thorough review of its asset portfolio. A recent announcement made by Canada's Prime Minister Stephen Harper to support infrastructure improvements to heritage, tourism, waterway and highway assets located within national historic sites, national parks, and national marine conservation areas across Canada will inject money into Parks Canada's system of heritage places. The presentation will end with the illustration of some of the projects to be undertaken in the five years to come.

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Parks Canada, historic

Lead author / Session organizer **Genevieve Charrois** Director, Heritage Conservation

Parks Canada RAIC genevieve.charrois@pc.gc.ca

Additional authors / organizers

## Japanese American Confinement Sites: Digitally Reconstructing an Erased History

What will I get out of this?

Audience will learn about specific digital preservation technologies and how CyArk's project facilitated Park and community engagement, techniques that may benefit sites across the US.

**Abstract** 

This paper discusses the multifaceted 4-year initiative to document three Japanese American Confinement Sites across the western United States: Manzanar, Topaz, and Tule Lake. Supported by the Japanese American Confinement Sites Grant Program of the National Park Service, Oakland-based nonprofit CyArk created 3D digital reconstructions of these three sites to better facilitate the education, dissemination, and broader discussion of the incarceration of over 120,000 Japanese Americans during World War II. The minimal physical remains at these sites today lends towards difficulties in site preservation and remembrance. CyArk and the involved parks jointly dedicated the project to providing the public with an easily accessible reconstruction of these sites to stir education and reflection about this turbulent time in history. This paper will discuss the multiple relationships involved in completing this project, from government entities to the local community, to curate a virtual 3D experience that succinctly communicates these sites of travesty.

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3D, Digital, Education

Lead author / Session organizer

authors / organizers

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Additional

**7697** Panel Discussion

### Resource Stewardship Strategies: a practical approach for all parks

What will I get out of this?

The National Park Service will present an revised framework for developing Resource Stewardship Strategies for all parks that is based on a park's foundation document.

**Abstract** 

Resource managers need a tool to link long-range conceptual planning with implementation and everyday management decisions for achieving a park's desired natural and cultural resource conditions. To meet this need, the National Park Service has been continuing its development of a Resource Stewardship Strategy (RSS) framework that is based on a park's foundation document. RSSs establish science- and scholarship-based methods to determine measurable targets for successful resource management. They include a comprehensive strategic plan for achieving and maintaining those targets over time. The session will begin with an overview of the RSS program followed by a discussion of recent changes to the RSS format and lessons learned from past efforts. Panelists will share their vision for future RSSs as well as experiences using RSSs, their processes, funding and personnel decisions, and challenges and successes. A facilitated Q&A period will close the session to stimulate ideas for program enhancement.

Keywords

Resources, Stewardship, Strategy

Lead author / Session organizer **Chris Church** Project manager

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Additional authors / organizers

Chief of Planning - NPS Park Planning and Special Studies / Introduction to RSSs

Patrick Gregerson

RSSs at parks - Lessons Learned

Superintendent from a park with a recently completed RSS

RSSs at parks - Lessons Learned

Chief of Resources at a park with a recently completed RSS

Natural resource stewardship and RSSs

Representative from the Natural Resource Stewardship and Science program

Cultural resource stewardship and RSSs

Representative from a regional cultural resources program

Alpine moist meadow response to regional gradients of nitrogen deposition in the Rocky Mountains

What will I get out of this?

This presentation highlights the results of a three year study looking at ecological consequences of ambient nitrogen deposition within the alpine of the Rocky Mountains.

**Abstract** 

Human alteration of the nitrogen (N) cycle has resulted in a drastic change in availability of biologically active N. Alpine ecosystems are particularly susceptible to increased inputs of N, as higher elevations receive disproportionately more precipitation and therefore high rates of N input. The objective of our study was to examine effects of ambient N deposition in alpine moist meadow communities, and determine whether changes in community and ecosystem characteristics show evidence for N saturation. Our results show that, generally, sites receiving higher levels of N deposition have more indication of increased N saturation. Ambient levels of N deposition in many federally protected lands in Colorado are approaching, or have exceeded, the current estimated critical loads of N for changes in species composition, and these findings present a baseline of the current status of N saturation for several federally protected alpine areas in CO.

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Plants, Biogeochemistry, Pollution

Lead author / Session organizer

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Additional authors / organizers

Matthew J. Ribarich, University of Colorado, EBIO

William D. Bowman, University of Colorado, EBIO, INSTAAR, Mountain Research Station

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When rangers meet Alarmed Alice and Dismissive Dan: Advancing climate change communications in NPS

What will I get out of this?

Learn how localized climate impacts in parks can be communicated for a diversity of audience types, ranging from climate advocates to skeptics.

**Abstract** 

NPS National Capital Region has partnered with George Mason University's Climate Change Communication Center to develop educational tools to aid rangers in meeting NPS climate change communication expectations for engaging diverse audience types. This project has applied the Global Warming's Six Americas classifications to communicate localized climate impacts in an innovative ranger guidebook, which was distributed in the fall of 2014. Pre- and post-guidebook distribution data on rangers' climate change beliefs and communication practices allow this dynamic document to be improved and evaluated for effectiveness. This paper will describe our approach in applying social science research that is statistically representative of the American population to interpretive materials, and the results of our pre-distribution survey. We will demonstrate how we have designed the guidebook include information about each of the major NPS bioregions and tailored messages for specific beliefs, attitudes, and motivations about climate change.

Keywords

climate, communication, NPS

Lead author / Session organizer

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Additional authors / organizers

Jenell Walsh-Thomas, PhD student, George Mason University's Center for Climate Change Communication

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Enhancing paleontological resource stewardship through collaborative projects: locality portals, monitoring programs, outreach, and research

What will I get out of this?

Enhance paleontological resource management through collaboration with non-federal partners. Learn how locality data, baseline inventory reports and field monitoring programs allow non-specialists to manage fossils.

**Abstract** 

Collaboration between the University of California Museum of Paleontology (UCMP) and the National Park Service (NPS) (administered through the Californian Ecosystem Studies Unit) is improving paleontological resource management in parks. UCMP is serving paleontological locality data to park staff for fossils previously collected from within the boundaries of NPS areas in California. This has enabled error correction, and provided baseline locality information that was incorporated into a paleontological resource inventory report for Golden Gate National Recreation Area. Locality data allows parks to assess current conditions and whether any actions need to be taken to protect fossil resources. Point Reyes National Seashore is collaborating with UCMP to develop a long-term field monitoring program based on locality information. UCMP has a long history of working in and with parks and protected areas. It is anticipated that applying this model of collaboration between non-NPS experts and resource management staff will enhance resource management.

Keywords

paleontological resource management

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Additional authors / organizers Angela Evenden - National Park Service, Pacific West Region, Californian Cooperative Ecosystem Studies Unit

Vincent L. Santucci - National Park Service, Geologic Resources Division

Mark B. Goodwin -- University of California Museum of Paleontology

Charles R. Marshall -- University of California Museum of Paleontology, Department of Integrative Biology, University of California, Berkeley

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Will a hot California affect breeding northern elephant seal females and pups?

What will I get out of this?

Audience members will learn about a newly identified potential effect of climate change on elephant seals and how thermographic cameras can be used with wildlife.

**Abstract** 

Pinnipeds may come onshore for extended periods of time during the breeding season and many species retreat to the water if exposed to high ambient temperature. However, the natural behavior of adult female northern elephant seals with lactating pups is to avoid the water during this sensitive time. As California's air temperature is predicted to increase due to climate change, female elephant seals may need to adapt or suffer from hyperthermia. A colony in Point Reyes National Seashore displays this previously undescribed behavior of retreating to the water at high ambient temperatures. We used a thermographic camera to measure skin temperature of adult females and pups and investigated the seals' different thermoregulatory properties and behaviors at different stages of lactation. Environmental variables, such as ambient temperature and solar radiation, were analyzed for their effect on skin temperature. Results will inform park managers on potential elephant seal conservation actions.

Keywords

Climate change, conservation

Lead author / Session organizer

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Dr. Sarah Allen, National Park Service.

7879

# Accelerating Diversity Through Variable Density Thinning in a Coastal Temperate Rainforest

What will I get out of this?

Learn how you can use variable density thinning with no biomass removal to put former industrial timberlands on a trajectory towards resilient, old growth forest.

**Abstract** 

Lewis and Clark National Historical Park is actively restoring recently purchased second and third growth industrial timberlands to the natural conditions and processes characteristic of the intact Sitka spruce rainforest that was experienced by the Corps of Discovery in 1805-1806. Forestry modeling software was utilized to project future conditions and visualizations of various treatment scenarios, which inform stand prescriptions. These prescriptions include Variable Density Thinning, snag creation, biomass retention, and underplanting of species made rare through past management practices. Unlike drier forests where fire and disease outbreaks are a serious concern, wind is the primary driver of ecosystem dynamics in temperate Sitka spruce rainforests. This allows the park to leave all biomass in place to provide wildlife habitat and build soils. It also allows the use of small hand-crews, which limits impacts to visitors and wildlife while accelerating structural and biological diversity.

Keywords

forestry, restoration, rainforest

Lead author / Session organizer

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Additional authors / organizers

Chris Clatterbuck, Chief of Resources, Lewis and Clark National Historical Park

0024	PLM National Landscape Consequation System
9031 Freestanding—	BLM-National Landscape Conservation System
What will I get out of this?	
Abstract	Exhibit highlighting BLM's National Landscape Conversation System
Keywords	National Conservation Lands
Lead author /	Mark Conley Program Manager - National Landscape Conservation System-California
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Additional authors / organizers	
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**7874** Panel Discussion

Achieving Effective Stewardship by Making the Shift from Traditional to Collaborative Education Program Development

What will I get out of this?

This session challenges participants to rethink traditional NPS approaches to resource education by exploring place-based service learning, co-created with teachers to achieve common goals.

**Abstract** 

Across the country, teachers and schools are being challenged by a rapidly shifting educational context that asks them to design learning opportunities focused on 21st century skills, including critical thinking, problem solving, and scientific and civic literacy. Meanwhile, the NPS strategic vision Achieving Relevance in Our 21st Century asks the service to "accept and fully embrace our role of critical contributor to America's educational ecosystem...". This session will bring participants to the intersection of these two arenas, demonstrating the strong potential of co-created place-based service learning opportunities to address common NPS and school goals, grounded in the experience of ten urban and rural parks within the Northeast Region. This session will share the promising practices of place-based service learning and challenge participants to dive into an exploration of the potential application of this approach to meeting contemporary NPS resource conservation and educational objectives in their park and program areas.

Keywords

sharing-authority, co-creating, education

Lead author / Session organizer **Cris Constantine** Education Program Manager

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Additional authors / organizers

rincipal,	Confluence; l	Park for Every	Classroom I	Partner and	Place-based	Service I	Learning (	Content I	Expert
Delia Clark									

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Park for Every Classroom Coordinator: Salem Maritime NHP; partner, Essex National Heritage Area

Maryann Zujewski

Northeast Region Education Program Manager, Park for Every Classroom Regional Program Coordinator Cris Constantine

#### Wildlife Harvest on Alaska's National Preserves

What will I get out of this?

Predator management on National Preserves: When does active game management take the 'natural' out of 'naturally-functioning ecosystem?'

**Abstract** 

In enacting the Alaska National Interest Lands Conservation Act (ANILCA) in 1980, Congress' stated purpose was to establish nationally significant areas to preserve them "for the benefit, use, education, and inspiration of present and future generations." While the congressional designation of "National Preserves" in Alaska specifically allows for sport hunting; the taking of wildlife for sport purposes in National Preserves is generally regulated by the State. With the passage of Alaska's 1994 'Intensive Management' Statute; State and federal management objectives appear to diverge. In September of 2014, the Alaska Region of the National Park Service proposed to amend regulations for sport hunting and trapping in National Preserves. Under this proposal, State laws or regulations that authorize hunting or trapping activities or management actions involving predator reduction efforts, with the intent or potential to alter natural predator-prey dynamics to increase hunter success; would not be adopted.

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wildlife, predator, Alaska

Lead author / Session organizer **Debora Cooper** Associate Regional Director

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Additional authors / organizers

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### El Venado y el Aguila: Reaching Spanish-speaking Populations in the Pacific Northwest

What will I get out of this?

Gain an understanding of how communications in Spanish develop new constituencies for refuges and parks while building rapport with future visitors, volunteers, and potential employees.

Abstract

In 2014 24 percent of first-graders in Oregon schools are from Latino households, many with parents who speak little English and have no experience with parks, refuges, and protected areas. The regional office of the Fish and Wildlife Service has launched a systematic outreach effort in Spanish to draw such families into closer contact via electronic media, television programming, language-capable volunteers, and other facilitation. By using Spanish to explain the lives of venado (deer), aguilas (eagles), and other wildlife species to populations that have never encountered animals in the wild, and by helping recent immigrants appreciate the significance of habitat protection, the FWS has experienced a demonstrable increase in engagement with the Latino community.

Keywords

Spanish-speaking, outreach, media

Lead author / Session organizer

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Additional authors / organizers

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# Opportunities and Examples of Biodiversity Discovery in the National Park Service

What will I get out of this?

Biodiversity Discovery is an adaptable approach to addresses biological conservation objectives while inspiring an appreciation for national parks and the natural world among public audiences.

**Abstract** 

Pindiversity Polevancy Inventory

Increasing global threats such as climate change, invasive species, and loss of habitat, have made national parks critical reserves of biodiversity. However, the majority of species in parks—primarily invertebrates, non-vascular plants, fungi, and microorganisms—remain undiscovered. Simultaneously, decreasing relevancy of national parks and the disconnection of youth from nature threaten the foundation of the NPS. Biodiversity Discovery provides an opportunity to improve both situations; an opportunity to address biological conservation objectives while inspiring an appreciation for national parks and the natural world among youth and public audiences. Biodiversity Discovery is a cooperative effort where scientists join with students or other public volunteers to conduct science-based biological inventories. Examples from across the service, demonstrate the potential for biodiversity discovery to contribute to a wide-range of goals. The NPS Biodiversity Discovery Program provides guidance and resources to help parks coordinate, initiate, and execute Biodiversity Discovery events to meet unique park objectives.

Keywords	biodiversity, nelevancy, inventory			
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One People, One Reef: Combining Traditional Management and Modern Science for Sustainable Ocean Management Planning

What will I get out of this?

This presentation will outline a novel approach to sustainable ocean management combining modern analytical science with traditional knowledge from indigenous people of Micronesian Outer Islands.

**Abstract** 

Micronesian outer Island communities are on the front lines of ecological and cultural change, and are facing declines in critical reef resources, and the benefits that healthy reefs provide. We present our approach to working with the communities of Ulithi Atoll, Federated States of Micronesia, to re-establish traditional management within the current ecological context. We will present our ecological data characterizing the reefs and fish stocks with respect to human habitation and fishing pressure, and our interview and community meeting data characterizing the issues from the communities' perspectives. We will present the management plans that are being implemented, successes and impacts, and the processes people are using to establish plans and advance protection and management. This underutilized approach to working with indigenous people will be discussed as a potential model for the region, and in particular with peoples who have autonomous governance over resource use.

Keywords

traditional management, oceans

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Dr.Peter Nelson, CFR-West

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Parks Canada's evolving relationship with Aboriginal Partners: what was, what is and what will be

What will I get out of this?

Participants will understand the vision and practice behind Parks Canada's evolving relationships with Aboriginal partners, including current and future tools on effective Aboriginal engagement.

**Abstract** 

Strong relationships with Aboriginal partners are essential to Parks Canada achieving its vision and mandate. Over the years, Parks Canada has had many opportunities to better understand "what works" when it comes to fostering long-lasting relationships based on long-term commitment, trust, and mutual respect, along with opportunities to learn from past mistakes. Today, the path forward will continue to foster partnerships and connections Aboriginal peoples have with traditionally-used lands, including; facilitating access for Aboriginal peoples to Parks Canada heritage places, encouraging traditional activities and the use and transfer of traditional knowledge, and continuing to foster strong relationships through formal agreements.

Keywords

Additional authors / organizers

Aboriginal, Cooperative management

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Measuring social and economic effects of NPS lands: an overview of tools with example applications

What will I get out of this?

Attendees will gain an understanding of methods used to measure socioeconomic benefits through explanations, examples, and exposure to tools available to public lands managers.

**Abstract** 

NPS lands and resources provide a wide range of socioeconomic benefits to both nearby communities and society as a whole, including job creation, unique recreational opportunities, and subsistence and tribal uses. There is an increasing need to identify and measure socioeconomic effects of public land management decisions and the public's use of public lands and resources. The USGS and NPS are collaboratively developing tools to address these needs. This presentation will explain methods used to measure economic effects and will provide the NPS Visitor Spending Effects analysis as an example of measuring economic activity generated in local economies, and an analysis of the economic value of carbon sequestered by national parks as an example of ecosystem service valuation. Attendees will be introduced to ASPN (Assessing Socioeconomic Planning Needs), a tool developed to help planners and managers identify key socioeconomic issues that can arise as a result of land management actions.

Keywords

socioeconomic, benefits, tools

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Air Quality Issues and Trends at Mount Rainier, North Cascades, and Olympic National Parks

What will I get out of this?

A comprehensive analysis of air pollutant concentration and trends data enables NPS to identify highest priorities for future monitoring, research and pollution reduction efforts.

**Abstract** 

Mount Rainier, North Cascades, and Olympic National Parks are afforded special protection under the Clean Air Act. To better understand and protect air quality, the National Park Service and collaborators have monitored air quality and air-pollution sensitive resources in parks since the 1980s. Data for these three parks indicate improving trends for some air quality parameters but not for others. Visibility has gotten better on the haziest days at Mount Rainier and Olympic but not at North Cascades. Ozone concentrations at North Cascades and Olympic were below air quality standards, but those standards were occasionally exceeded at Mount Rainier. While current atmospheric deposition is relatively low, studies are investigating the potential effects of increased deposition on high elevation lakes and alpine communities with suspected nitrogen sensitivity. Airborne contaminants are of growing concern because concentrations of some pollutants, such as mercury in fish, have exceeded wildlife or human health thresholds.

Keywords

air, pollution, contaminants

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Mike Larrabee, North Cascades National Park

Bill Baccus, Olympic National Park

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Understanding patterns of dispersed visitor use and implications for ground-cover vegetation in Yosemite National Park

What will I get out of this?

This study demonstrates a methodology to create a socio-biological model of visitor use that can help managers predict possible locations of future recreation resource change.

**Abstract** 

The extent of resource impacts, which often occurs in protected areas as a result of visitor use, is influenced by the type, amount, location, and spatial and temporal distribution of recreation use. Research using global positioning system (GPS) technology has shown significant promise in providing detailed data from which to examine visitor use patterns and intensity especially in areas of dispersed visitor use. This study uses GPS-based tracking techniques to examine visitor distributions under various use levels in sensitive meadow habitat of Yosemite National Park. Results indicate that use levels have a significant influence on visitor behaviors and distributions in the meadows. Combining patterns and distributions of visitor use with maps of ground-cover vegetation susceptibility can help managers predict where future resource change may occur under different use level scenarios. A model of potential vegetation change was created by combining measures of visitor behavior with ecological maps of vegetation susceptibility.

Keywords

recreation ecology

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Todd Newburger, National Park Service

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7731
Panel Discussion

Concessions in the National Parks – a collaborative and innovative approach to natural resource management

What will I get out of this?

More than ever NPS concession facilities and operations are managed to protect natural and cultural resources while educating visitors and promoting environmental stewardship.

**Abstract** 

This compass session will allow leaders from the concessioner community and the NPS Commercial Services Program to share management techniques and program strategies, as well as new and innovative ways that concessioners and NPS staff are effectively managing concession operations in units within the NPS. Participants will learn about the challenges of operating a "sustainable" business in park settings and the surprisingly large and complex programs necessary. Case studies will focus on concession operations that are managed to promote a high level of visitor enjoyment while preserving resources for future generations. The panel will discuss techniques for minimizing impacts to resources, and share some of the innovative projects and programs being implemented. Panelists will address the following topics: managing concession programs with minimal impacts to resources, promoting sustainability and environmental best management practices, and educating visitors on park resource impacts.

Keywords

Concessions, Sustainability, Innovation

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The Mosaics in Science Program – Supporting Diversity, Inclusion, and STEM in National Parks

What will I get out of this?

Real examples of how Mosaics meets the needs of public lands in STEM (Science, Technology, Engineering, Mathematics) fields, and how the program is evolving.

**Abstract** 

This presentation aims to provide a case study of the 2-year old "Mosaics in Science" program and stimulate a discussion of ways in which such a program can successfully evolve to further meet the needs of diverse youth as well as the needs of the National Park Service (NPS). The Mosaics program was developed in 2013 as a partnership between the NPS and the Geological Society of America (GSA). The goal is to provide rigorous STEM work opportunities to youth from groups that are underrepresented in STEM and in NPS. So far, 33 youth have worked on STEM projects at 30 different NPS sites. After they complete their projects, participants gather in Washington, DC, for a career workshop to present the results of their work, meet with NPS staff, and attend career development sessions. As the program grows, increased mentoring, more varied STEM projects, and closer career guidance are planned.

Keywords

Geoscience, STEM, education

Lead author / Session organizer

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# Improving World Heritage management by 'operationalising' Outstanding Universal Value

What will I get out of this?

A proven methodology for World Heritage managers to more effectively understand and use their 'Outstanding Universal Value' (OUV) for planning and management will be demonstrated.

**Abstract** 

The term 'Outstanding Universal Value' (OUV) provides the foundation for nominating a site as World Heritage, and all World Heritage properties are required to have a Statement of OUV (SoOUV). OUV is central to the way the World Heritage Committee assesses whether the values for a World Heritage property are maintained or lost, so OUV needs to remain the fundamental cornerstone for managing these sites. This session will outline a methodology for World Heritage managers to 'operationalize' their SoOUV to more effectively understand and use their OUV for planning and management. The approach helps to identify the key attributes of OUV, to assess the current status of those attributes and the key factors that are threatening them, enabling measurable actions to be developed to address those threats. The same methodology can similarly be applied to other non-OUV values within a World Heritage property or other protected area.

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Invasives plant early detection and control following Yosemite's Rim Fire: Strategies for the landscape level

What will I get out of this?

Yosemite developed a successful toolset and strategy to implement post-fire invasive plant survey and treatments that are ready for implementation by other land managers.

**Abstract** 

Keywords

Invasive-Plants, Fire, Yosemite

Wildfire is an integral ecosystem process, but can also facilitate the introduction and spread of invasive plants; fire creates disturbance and suppression operations can act as invasive plant vectors. In response, Yosemite implements targeted early detection and rapid control of invasive plants post-fire. Areas with the highest probability of invasive plant occurrence are targeted based on previously known infestations, fire management operations, and habitat suitability. Past surveys honed techniques on fires smaller than 7,000 acres. We validated our methods on a landscape level after the 2013 Rim Fire burned 78,000 acres in the park. Demonstrated strategies are needed after fires to prevent invasive plant establishment. As the scale and severity of fires across the region are predicted to increase due to a changing climate and a resetting of the fire return interval, such early detection post-fire procedures will be increasingly vital.

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Restoration of pre-disturbance conditions to severely eroded montane wetland at Halstead Meadow, Sequoia National Park

What will I get out of this?

Viewers will learn how we transformed a deeply eroded, dewatered meadow back to a naturally-functioning wetland by using an innovative approach transferable to other parks.

**Abstract** 

Halstead Meadow is a 21-acre wetland bisected by the Generals Highway. The meadow had developed severe erosion gullies, lowered water tables, dried wetland soils, and wetland plant dieback due to historic grazing and water channelization through culverts. Past efforts to restore the meadow using check dams and willow planting were unsuccessful. In 2005, the park proposed a new approach: restore wetland topography, hydrology, and vegetation to pre-disturbance conditions by filling the erosion gullies and converting the incised channel system to a natural sheet flow system. Two phases of restoration are complete and a bridge has replaced the filled roadway, restoring 7 acres of wetland and protecting 9 acres from further degradation. 24,000 cubic yards of fill have been placed and 155,000 native wetland plants installed. High water tables are restored and wetland plants are thriving. The phased approach has allowed the team to learn from mistakes and improve restoration methods.

Keywords

wetland,restoration

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### Producers, policies and protected areas in Panama

What will I get out of this?

Audience members will gain exposure to the challenges and conflicts associated with achieving sustainable development and conservation in the context of central Panama.

**Abstract** 

Despite global concerns about deforestation, we lack rigorous understanding of how deforestation affects and is affected by smallholder farmers. Given the perception of farming as a main cause of deforestation and biodiversity loss, NGOs and the Panamanian environmental authority are promoting agroforestry projects among farmer associations within the buffer zone of Santa Fe National Park. The research objectives of this study are: 1) Examine why farmers, NGOs, and government agencies participate in agroforestry projects; 2) Describe the relationship between agroforestry projects and farmer associations; 3) Document conservation and agroforestry practices of farmers on their farms. The research links microlevel natural resource management of smallholder farmers and livelihood strategies with macro-level projects and discourse about agroforestry. Methods include semi-structured interviews and participatory mapping. The research will show how farmer association members embrace, ignore, or otherwise respond to the messages of environmental NGOs, government, and other outside actors.

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agroforestry, Panama

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Assessing the needs of Visitor and Resource Protection employees in the National Park Service

What will I get out of this?

This session will highlight the largest training gaps in knowledge, skills and abilities in natural and cultural resource protection, visitor safety and backcountry management.

**Abstract** 

The National Park Service has a dual mandate of conserving units for future generations and providing enjoyment for current visitors. The Visitor and Resource Protection division is integral to accomplishing this mission. Through knowledge, skills and abilities in natural and cultural resource protection, visitor safety and employee safety, National Park Service employees are able to maintain the integrity of resources and visitor experiences. To keep up with constantly changing conditions the Visitor and Resource Protection workforce recently completed a needs assessment to identify training gaps. Employees rated the importance of and their preparedness to perform job competencies in natural and cultural resource protection, visitor safety and employee safety. Mean weighted discrepancy scores were calculated to identify the largest gaps in training. Areas for improvement in natural and cultural resource protection included specialized law enforcement skills, gathering and synthesizing data and collaboration and partnerships. Visitor safety revealed training needs for specialized investigative skills and the ability to synthesize data.

Keywords

assessment, protection

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**7771** Day-Capper

### Starting a George Wright Society Student Chapter

What will I get out of this?

This session will inform attendees about the first George Wright Society student chapter. It will also encourage the development of additional student chapters.

**Abstract** 

Students are an important subset of the George Wright Society. In order to encourage further involvement with the organization with the goal of long-term membership, the George Wright Society has established its first student chapter at Clemson University. The student chapter receives academic, networking and professional development benefits for its participation. The Clemson University student chapter has been incredibly successful in their inaugural year. The purpose of this session is to explain George Wright Society student chapters, share Clemson University's experiences thus far and encourage and recruit students to begin chapters at their respective universities. Additional goals will be to create a network of George Wright Society student chapters and devise ways to communicate and collaborate in the future.

Keywords

students, student chapters

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Monitoring Landbirds in Parks: A Demographic Approach to Understanding Populations, Migratory Connectivity, and Climate Change

What will I get out of this?

Monitoring life history demographics is essential to understanding population changes and enables conservation to be targeted when and where it's most needed.

**Abstract** 

Identifying the demographic causes of avian population change is crucial in developing conservation strategies. To address this need, IBP created the Monitoring Avian Productivity and Survivorship (MAPS) program. Eighty-three MAPS stations have been operated in 36 National Parks, with an additional 563 stations on other public lands. The program has collected more than two million capture records from over 1,200 stations in nearly every state and Canadian Province. In 2015, IBP will unveil a website that assesses seven critical demographic parameters, and examines pairwise correlations among them for 189 species. The results provide insight into the life history stages at which population change is being effected. MAPS data from Parks and protected areas have contributed to recent studies in avian response to climate change and migratory connectivity. Both areas of study will likely continue to be crucial elements of conservation planning throughout the 21st Century and beyond.

Keywords

Birds, Monitoring, Conservation

Lead author / Session organizer

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Sources of invasive plant introductions in Yosemite: When 4 million visitors are not the problem

What will I get out of this?

This presentation provides land managers information to target invasive plant surveys and prevention efforts. Managers will be inspired to assess potential vectors in their lands.

**Abstract** 

Invasive plants (invasives) are one of the biggest threats to Yosemite's fabled biodiversity. Over four million visitors come to Yosemite annually and provide a tremendous vehicle for invasives introductions. To better understand and ultimately curb infestations, Yosemite implements integrated pest management to prevent, detect, and control invasives. Botanists completed a three year comprehensive surveyed for invasives. Surveys targeted areas based on the probability of occurrence by assessing habitat suitability and propagule pressure. We categorized infestations based on associated sources e.g. road, trail, construction site, horse, fire operations, campground, unknown, etc. Our results indicate infestations are most closely related to park operations (employee housing and facilities), stock use, roads, and concessionaire buildings. Besides stock use, few infestations were associated with visitor activities. As such, future survey and prevention efforts may be best targeted at park management operations as staff and operations appear to be the biggest culprits in introducing invasive plants.

Yosemite, weeds, prevention
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Interdicting Aquatic Invasive Species: Pathway definition, risk analysis, and risk prioritization

What will I get out of this?

Learn about the application of a national framework for aquatic invasion pathway ranking and prioritization process to a specific protected area.

**Abstract** 

In order to inform the response planning efforts for the quagga mussel invasion at Glen Canyon NRA, an interagency working group was formed in late 2013 to provide an objective evaluation of potential pathways and vectors of spread of dreissenid mussels and other AIS relevant to Lake Powell. This analysis is science-based and informed by collective knowledge and experience of regional aquatic invasive species managers and scientists who used the framework developed by the National Invasive Species Council and the Aquatic Nuisance Species Task Force: "Training and Implementation Guide for Pathway Definition, Risk Analysis, and Risk Prioritization". Fifteen pathways were eventually scored through a three-step process and additional refinements were made to analyze sub-categories of come and go boats. This poster presents the process and outcomes to rank and prioritize pathways at Glen Canyon NRA.

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aquatic invasive species

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# Collaborative Management in a Costa Rican National Park: A Park for People and Sea Turtles

What will I get out of this?

I seek to examine how a park, initially developed to protect a single species, can continue to hold value to local residents.

**Abstract** 

Las Baulas National Marine Park in Costa Rica was established to protect nesting leatherback turtles. However, the current park model, closing off land and expecting wildlife and people to thrive, has created antagonism. Local residents have few opportunities to engage with park management and disregard park regulations. Moreover, the park's flagship species, the leatherback turtle, is now critically endangered. I seek to examine how a Park, initially developed to protect a single species, can continue to hold value to local residents. During December 2014 I will interview officials and local and foreign residents. I will utilize planning and policy theories to determine if additional value and community engagement can be found by proposing a new park philosophy, one that actively engages residents through co-management and citizen science opportunities, facilitates leatherback restoration, and underscores the value of the entire ecosystem. These data may define a collaborative future for people and wildlife.

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co-managment, turtles, interviews

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**7716**Panel Discussion

Five Qualities and Beyond: Integrating Wilderness Character in the National Park Service

What will I get out of this?

The 1964 Wilderness Act mandates wilderness character preservation. Following the Act's 50th anniversary (2014), this session will demonstrate the contemporary, interdisciplinary relevance of wilderness character.

**Abstract** 

The National Park Service recently developed concepts, tools, and examples for integrating wilderness character into park planning, management, and monitoring - culminating in the 2014 release of two guidance documents: 1) User Guide to Integrating Wilderness Character into Park Planning, Management, and Monitoring; and 2) Wilderness Stewardship Plan Handbook. The User Guide provides managers with succinct guidance, templates, and examples about integrating wilderness character and streamlines compliance through a transparent decision-making framework consistent with NPS policy. The Handbook offers direction for wilderness stewardship plan development rooted in wilderness character preservation. Together, these products create the structure for park-to-park sharing of experiences, ideas, and best practices to reach wilderness stewardship goals as quickly and efficiently as possible. Panelists from different NPS parks and programs will highlight case studies where one or both documents were implemented. Dialogue with the audience to consider the importance/applicability of wilderness character and stewardship will follow.

Keywords

wilderness character, stewardship

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What is wilderness character? An exploration of law, policy, and practice

Erin Drake, Communications and Outreach Specialist, NPS Wilderness Stewardship Division

The NPS Wilderness Character User Guide and Stewardship Plan Handbook: An Overview

Chris Holbeck, Natural Resource Program Manager, NPS Midwest Regional Office

Integrating Wilderness Character into Park Planning, Management, and Monitoring: Case study #1

Brenda Todd, Planner, NPS Denver Service Center

Integrating Wilderness Character into Park Planning, Management, and Monitoring: Case study #2

Christina Miller, Planner, Olympic NP

What does this all mean? The future of wilderness character preservation in the NPS

Tim Devine, Branch Chief for Training and Development, NPS Wilderness Stewardship Division

### Monitoring What Matters on Our National Wildlife Refuges

What will I get out of this?

The Fish and Wildlife Service is changing how it conducts the science on its 563 refuges, working with partners to develop rigorous protocols.

**Abstract** 

The new Inventory and Monitoring (I&M) policy for the National Wildlife Refuge System, signed in 2014, provides a strategy for selecting and completing necessary scientific surveys in a time of diminishing capacity. It has three tenets: the surveys conducted must address wildlife management priorities, they must pass scientific muster, and they should try to involve others, recognizing that many pressing issues are at the landscape scale. Successes of the National Park Service I&M Division have been adopted by the refuges, including the Service Catalog (ServCat), the digital record system that uses the software developed by the NPS Data Store. The policy includes monitoring standards; survey protocols on shorebirds, bees and plant phenology are completed and undergoing review. Having a cohesive monitoring effort over the 563 wildlife refuges covering 150 million acres is a significant step forward and ultimately will allow the Refuge System to complete fewer, but more reliable surveys.

Keywords

Monitoring, protocols, policy

Lead author / Session organizer

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Jana Newman, U.S. Fish and Wildlife Service, National Wildlife Refuge System

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7741 Workshop

# Advancing NPS Biodiversity Discovery beyond the Call to Action: A Roundtable Discussion

What will I get out of this?

Discover strategies and benefits of Biodiversity Discovery in the NPS; then evaluate and discuss innovative approaches for advancing biodiversity discovery beyond the "Call to Action".

**Abstract** 

"A Call to Action" launched a new vision for the second century of NPS stewardship. Biodiversity Discovery was identified as a way to inspire the next generation of stewards by engaging youth and citizen scientists in science-based biological inventories that contribute to NPS knowledge of park biodiversity. The NPS was challenged to conduct Biodiversity Discovery activities in at least 100 parks before 2016; as of July 2014, this goal has been met. Biodiversity Discovery has proved valuable in advancing the NPS mission. This workshop will summarize the strategies, styles, and benefits of Biodiversity Discovery through the "Call to Action." Participants will then be invited to discuss innovative approaches for advancing biodiversity discovery toward becoming a service-wide solution (and example) for tackling complex social and environmental issues of the future.

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Biodiversity, Inventory, Relevancy

Lead author / Session organizer

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7865

# Impacts of 2013 "Aspen" and "Rim" Fires on Air Quality in Devils Postpile National Monument

What will I get out of this?

2013 Air pollutants monitored at DEPO informed potential impacts on human /ecosystem health at this "pristine" Sierra site and need for monitoring at remote areas.

**Abstract** 

Air pollutants with potential effects on human and ecosystem health were monitored in summer 2013 at Devils Postpile National Monument including ozone, ammonia, nitrogen oxides, nitric acid, volatile organic compounds, sulfur dioxide and fine particulate matter (PM2.5). The original objective of the study was to develop a better understanding of how air quality at DEPO is affected by locally produced air pollutants compared with those transported from remote pollution source areas, such as the California Central Valley and the San Francisco Bay Area. No major impacts of local emissions on air quality were detected and generally were low before the Aspen and Rim Fires. Emissions from these fires drastically changed the air quality status at DEPO especially on PM2.5 which reached the "unhealthy" level of the Air Quality Index (AQI) during the Aspen Fire and the "unhealthy for sensitive people" level during the Rim Fire resulting in air quality advisories.

Keywords

aspen/rim fires pollution

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**7852** Panel Discussion

## Climate Change Refugia as a Tool for Climate Adaptation

What will I get out of this?

Managing for climate Refugia offers a potential climate adaptation strategy for transitions or long term efforts. What are the opportunities and challenges of implementation?

**Abstract** 

The concept of climate refugia has a long history in Quaternary Science, but now describes a strategic management approach for climate adaptation. Here refugia are areas buffered from contemporary climate change so as to increase persistence of valued physical, ecological, and cultural resources. Physical processes (such as cold air pooling) and conditions (cooler, moister and topographically complex) contribute to maintaining components refugia but may not be stable or persistent enough to support the biological community. Four Sierra Nevada case studies will be presented: The recovery program for endangered bighorn sheep constitutes a de facto network of long term refugia; American pika's thermal regimes on talus habitat provide potential localized refugial clusters; Cold air drainages containing Cascadian flora are examples of functioning refugia. Identification and objectives need to be developed to provide information for prescribed plans and wildfire strategies; and Devils Postpile manages Sodas Springs as a meadow refugium amidst several challenges.

Keywords

refugia adaptation management

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Cold-air Pooling in the Mountains—What do we need to know?

Michael Dettinger, Research Hydrologist, USGS

Refugia for Climate Adaptation: Examples from Sierra Nevada Bighorn Sheep and American Pika

Constance Millar, Senior Scientist, Pacific Southwest Research Station USDA

Cold Air Drainages as Climate Refugia for plants (and other less motile organisms)

Alison Colwell, Botanist, Yosemite National Park

Soda Springs Meadow as a climate change refugium: Management implications for visitor use and biological communities

Monica Buhler, Ecologist and Resource Education Specialist, Devils Postpile National Monument

# Defining the reference condition for the natural moonless night photic environment

What will I get out of this?

A reference standard for assessing the severity of light pollution, for which there is currently a scarcity of literature, is proposed,.

**Abstract** 

Keywords

light pollution

A model for natural sources of light at night on the earth's surface is presented which predicts numeric quantities of luminance and illuminance experienced at a given location, date, and time. Cosmic and atmospheric sources of light are considered, excluding the moon, as well as the effect of varying levels of atmospheric extinction. By exploring a variety of locations, the potential range of natural atmospheric airglow, and times of the year, a possible range and median values for such measures is predicted. These values are proposed as a description of the reference natural condition, to which field measurements that include artificial sources may be compared. In addition, the model is presented in high resolution over the entire hemisphere of sky, and may be subtracted from field measurements at similar resolutions to reveal the extent of the artificial or human-cause component.

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"Living with Polar Bears": Building Relationships and Collaborative Management in Arctic National Wildlife Refuge

What will I get out of this?

Participants will gain an understanding of key issues in the management of human/polar bear interactions and hear successful strategies in a context of competing values.

**Abstract** 

Human relationships with natural landscapes are important concepts in protected area management. Polar bear management in the Arctic National Wildlife Refuge exemplifies the need to understand multiple relationships and competing values in places with cultural and global significance.

This case study investigated the relationships between protected area managers, Alaska Native peoples, and rural stakeholders on Barter Island. A rapid appraisal approach was used to identify key issues and to understand collaborations between stakeholders to manage human/polar bear interactions. The appraisal revealed critical issues including visitor education, public safety, and protecting Alaska Native cultural practices. Successful efforts were demonstrated through the local youth ambassador program, safety patrols, and efforts to improve food/attractant storage.

It is important for stakeholders to define and redefine what the "right relationship" is between polar bears and humans. This relationship must be part of the landscape narrative as efforts move forward to conserve and protect polar bears.

Keywords

collaboration, relationships, Alaska

Lead author / Session organizer

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Brian Glaspell, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge

Jennifer Reed, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge

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# Changes in Landbird Distribution and Abundance related to Vegetation Changes at Channel Islands National Park

What will I get out of this?

While learning about the status of Channel Islands NP landbirds, the viewers will learn how to evaluate landbird monitoring trends in relation to vegetation changes.

**Abstract** 

To discern recent breeding landbird trends related to vegetation change at Channel Islands NP (CHIS) for the Natural Resource Condition Assessment (NRCA), we evaluated a long-term (21 year) dataset comprising both line transect and point count data, both of which included estimated distance to birds detected, at three levels: annual presence/absence of species, frequency on point-count transects, and density estimation via distance methods. Overall, trends were apparent for the 32 most abundant of the park's 44 breeding species, but the methods failed to detect trend for rare species. Changes in the distribution and abundance of some species over the 21 year period were related to management actions and ecological changes such as the cessation of cattle grazing on Santa Rosa Island, removal of non native pigs and ungulates from Santa Rosa and Santa Cruz Islands, the decline of island foxes (Urocyon littoralis), and increases in peregrine falcon (Falco peregrinus) populations.

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Landbird trends

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Additional authors / organizers

Timothy Coonan, Channel Islands National Park

The Data Store and ServCat – collaborative efforts that make documents and datasets accessible

What will I get out of this?

Information generated by the government costs taxpayers millions annually. This information is an asset, not only to government, but also its partners, and the public.

**Abstract** 

Making the vast unpublished literature and data on the resources in national parks and national wildlife refuges available to researchers and the public has been a challenge for decades. The administration, through the Open Data Initiative (Executive Order 13642 of 2013) has mandated that government agencies make all non-sensitive data available to the public. The National Park Service (NPS) developed the Data Store, a records system to catalog their resource information. The U.S. Fish and Wildlife Service (FWS) collaborated with the NPS to create a FWS version of the Data Store called the Service Catalog (ServCat). Non-sensitive records housed in the Data Store and ServCat are automatically harvested by Data.gov, allowing both agencies to meet the Open Data Initiative, reinforce their commitment to sharing their resource information, and to leverage the knowledge and expertise of citizen scientists to resolve current natural resource issues

Keywords

resource information, data

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Kathy Dratch, National Park Service

Sarah Shultz, Managed Business Solutions

Peter Dratch, U.S. Fish & Wildlife Service

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<b>7628</b> Paper	"Natural parks": How a protected area agency has created outliers in the inner city
What will I get out of this?	"Natural park" outliers are an effective way for protected area agencies to reach out to inner-city residents
Abstract	In Los Angeles, a California state protected area agency has created "natural park" outliers in some of the poorest and most run-down areas of the city. These parks are a "reflection," rather than a restoration, of the natural ecosystems of the region. They have succeeded in exposing local residents to nature and linking them to nearby mountain and coastal protected areas.
Keywords	urban, city
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Additional authors / organizers	Amy Lethbridge, Deputy Executive Officer, Mountains Recreation and Conservation Authority, Los Angeles
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### Spotted and barred owl monitoring in Marin County, CA

What will I get out of this?

Discussion of a current, controversial wildlife management issue.

**Abstract** 

The rapid expansion of barred owls into the range of the northern spotted owl is recognized as one of the greatest threats to the spotted owl's population. Marin county is at the southernmost extent of the northern spotted owl's range, and to date has been minimally impacted by barred owls, which have been expanding their range southward from the Pacific northwest. With it's exceptionally high density of spotted owl territories, Marin provides a unique "laboratory" in which to study the early-stage impacts on a threatened species of the range expansion of a close competitor. Studies in other locations have examined the effects of lethal removal of barred owls from spotted owl territories, in an attempt to protect spotted owls. These studies are controversial, and the debate brings up interesting issues surrounding the appropriate role and extent of human intervention in the preservation of an iconic species.

Keywords

wildlife, management, conservation

Lead author / Session organizer

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Salt marsh biogeochemistry in a changing climate: the effects of extreme precipitation

What will I get out of this?

Audience members will hear about an experiment designed to improve our ability to predict and model salt marsh responses to climate change.

**Abstract** 

The intensification of precipitation patterns is an aspect of climate change that is likely to be particularly important in ecosystems that are chronically water-stressed, either from drought or from waterlogging and subsequent anoxia. As tidal wetlands, salt marshes are subject to multiple stressors including anoxia, high salinity, and sulfide toxicity. Changes in freshwater input could impact processes that build marshes (such as plant growth) and erode them (such as decomposition), with consequences for their ability to sequester carbon and keep pace with sea level rise. I am conducting an experiment to test the effects of precipitation change on salt marsh biogeochemistry. I have constructed shelters to divert rain and create precipitation treatments in experimental plots in which I measure greenhouse gas fluxes, marsh grass productivity and decomposition, and nutrient cycling through plants, sediment, and porewater. This work will help improve predictions of climate change impacts on salt marshes.

Keywords

marsh, climate, biogeochemistry

Lead author / Session organizer

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Forest Restoration at Redwood National Park: Exploring Silvicultural and Prescribed Fire Alternatives to Second-Growth Management

What will I get out of this?

We will explore the use of mechanical thinning and prescribed fire as alternative restoration tools to restore degraded coast redwood forests.

**Abstract** 

Over half of Redwood National Park is comprised of second-growth forests characterized by high stand density, deficient redwood composition, and low biodiversity. Silvicultural practices are increasingly being employed by conservation agencies to restore degraded forests throughout the coast redwood range; however, prescribed fire treatments are less common. We present an early synthesis from a number of management-scale thinning and prescribed fire projects spanning one to twenty years post-treatment. We explore how these treatments affect stand conditions, fuel load and composition, and tree mortality. Managers of coastal redwood ecosystems will benefit by having a variety of tools at their disposal for forest restoration and management.

Keywords

forest thinning, fire

Lead author / Session organizer

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Phillip van Mantgem, Research Ecologist, U.S. Geologic Survey, Western Ecological Research Center, Redwood Field Station, Arcata, CA 95521.

### **Diversity on Public Lands**

What will I get out of this?

Audience will become more familiar with issues affecting diverse visitation to public lands and what certain parks are doing to address this.

**Abstract** 

The issue this project seeks to understand and help solve involves diversity of visitation on public lands. The question this project seeks to address is; "What barriers exist to public lands visitation from diverse populations?" This project seeks to address this question through a combination of forum-style events involving minority community members and land mangers, "outings" to public lands and interviews with key stakeholders. As well, assessment of participant's perceptions of public lands and their cultural relevancy will be collected through interviews and survey methods. This project seeks to create awareness and dialogue about barriers that prevent certain groups from visiting public lands and in the long run make public lands more accessible for all cultural and ethnic groups.

Keywords

**Diversity, Public Lands** 

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Managing for change in a rapidly changing landscape: Glacier Bay National Park and Preserve, Alaska

What will I get out of this?

Through case study of a rapidly changing landscape, audience will learn approaches to incorporating various sources and magnitudes of change into management of natural resources.

**Abstract** 

One challenge of managing protected areas is determining what conditions we are managing for and how to incorporate various sources and magnitudes of change into our assessment of past, present, and desired future conditions. Glacier Bay, Alaska has experienced one of the most rapid rates of de-glaciation on record. In conjunction with this de-glaciation comes large scale landscape change as new lands and waters are exposed, the land rebounds from the release of the glacier's weight, successional changes occur, and estuarine waters respond to changing levels of freshwater runoff from glacial melting. It is through this lens of larger scale spatial and temporal change that we must view biophysical change on various other spatial and temporal scales. A synthesis of this approach of viewing multiple scales of change, including the challenges of understanding this complexity, will be presented using examples of how the park approaches management of various resources.

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de-glaciation, landscape, change

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### The Tamalpais Lands Collaborative - One Mountain, One Vision

What will I get out of this?

The audience will hear lessons learned from a successful model of multi-agency partnership for park and open space protection and management.

**Abstract** 

The conservation community is embracing creative approaches to land protection and stewardship, including strategic collaboration and collective impact. The recently formed Tamalpais Lands Collaborative (TLC) brings together the four agencies responsible for the management of Mt. Tamalpais (the National Park Service, California State Parks, Marin Municipal Water District, and Marin County Parks) and a conservation nonprofit (Golden Gate National Parks Conservancy). TLC partners have committed to a joint vision for the long-term health of the mountain, and have set the stage for a new, collective identity, while differentiating their agency roles. This presentation examines the TLC's partnership including issues addressed during formation, governance, purpose, mission and goals, partner roles, geographical focus, and resource allocation. It also outlines the collective impact approach of the TLC, research findings about the anticipated values and benefits of this partnership, and metrics for evaluating outcomes that can be applied to other land management collaboratives.

Keywords

Partnership Management Stewardship

Lead author / Session organizer

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Michelle O'Herron, Golden Gate National Parks Conservancy

Aaron Roth, National Park Service

Mike Swezy, Marin Municipal Water District

Kevin Wright, Marin County Parks

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# Lessons Learned during the Elimination of Non-native Animals from Channel Islands National Park

What will I get out of this?

Surprising challenges can threaten implementation of the most scientifically-grounded plans. We share "lessons learned" of problems and solutions to keep your project moving forward.

**Abstract** 

The National Park Service began in the 1950s to attempt to eliminate destructive non-native animals from the Channel Islands. The first success came in 1976 with the elimination of burros from San Miguel Island. This was followed by the elimination of rabbits from Santa Barbara Island, rats from Anacapa Island, sheep and pigs from Santa Cruz Island, and pigs, cattle, deer, and elk from Santa Rosa Island. The only remaining non-native mammal on the park islands is the black rat on San Miguel Island. Each removal involved challenges. Adequate funding and the technical capability to achieve eradications are obvious requirements. Additional necessities are capable partners, planning that can withstand legal challenges, political and upper management support, and substantial ecological knowledge. The lessons learned from animal eradications can inform the bold actions that future protected area managers will need to take in order to achieve stewardship goals.

Keywords

ecological restoration

Lead author / Session organizer

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Progress on Elimination of Argentine Ants from Santa Cruz Island, Channel Islands National Park (CINP)

What will I get out of this?

Non-native colonial ants are extremely difficult to control and impact many protected areas. We developed novel methods for efficiently distributing liquid bait in the field.

**Abstract** 

The Argentine ant (Linepithema humile) is a widespread, non-native ant in the southern United States. Santa Cruz Island is the only location in CINP that has Argentine ants. The Nature Conservancy and NPS have worked with experts to develop and test several baits and toxicants. Laboratory and field trial results using repeat applications of a highly dilute (as compared to current commercial products) toxicant/sugar water solution have shown very high efficacy and minimal non-target impacts. Water-absorbing polyacrylamide beads, in a novel use of a product sold to hold water in potted plants, allow helicopter dispersal of the liquid bait. In 2014 and 2015, we plan to treat the island's entire 1,180-acre infestation to be followed by monitoring and localized treatment as necessary. It is hoped that our methods will provide lower toxicity, effective options for control of Argentine ants in other locations.

Ke		

ecological restoration

Lead author / Session organizer

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### **Agave Restoration at Coronado National Memorial**

What will I get out of this?

Audience members will learn about restoration activities focused on restoring endangered species habitat along the international border.

**Abstract** 

In 2014, Resource Management staff members have been continuing work in the agave restoration area at Coronado National Memorial. The agave restoration area consists of 7.6 acres which were part of the equipment staging ground during construction of the international border fence in 2008. To offset the loss of Palmer's Agaves (Agave palmeri) during this construction, the Department of Homeland Security has provided funds for restoration. Agaves are an essential food source for endangered Lesser long-nosed bats when they roost at Coronado NMem each summer. Resource Management staff and hardworking volunteers have planted 5,100 agaves in the restoration area over the past four years. In late August 2013, 216 additional agaves were planted south of the restoration area. These agaves were initially delivered to the park in 2012, but were too small to plant that year. Most recently, three planting days were held during the summer of 2014.

Keywords

Restoration, Endangered Species

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Coronado National Memorial Partners with School Garden Program to Benefit Endangered Bats

What will I get out of this?

Audience members will learn about engaging youth and the community in restoration activities focused on restoring endangered species habitat along the international border.

**Abstract** 

Coronado National Memorial is engaged in a multi-year restoration project focused on mitigation of border impacts and restoration of critical habitat of endangered Lesser long-nosed bats. This project focuses on propagating native Palmer's agave and outplanting these plants in disturbed areas near the U.S.-Mexico Border fence. A by-product of this project has been a tremendous community outreach program where volunteers support the project in large one-day planting events. The park has expanded on this stewardship by partnering with a local middle school to propagate and transplant native agaves. Students from Kindergarten-8th grade are receiving presentations on important bat-agave relationships, propagation, and restoration, and are getting unique hands-on opportunities to engage in restoration activities. Furthermore, the park hosted two school field trips in 2014, which were the first on-site school presentations in Coronado NM since 2010; a result of border activities.

Keywords

**Engaging community, restoration** 

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# Fertile Islands- A New Approach for Managing Lehmann lovegrass-Dominated Grasslands

What will I get out of this?

Will educate audience members about an innovative approach to managing invasive species and promoting biodiversity through restoration.

**Abstract** 

Lehmann lovegrass (Eragrostis lehmanniana) is an invasive, perennial grass which dominates the grasslands at Coronado National Memorial. Resource Management staff have developed a new approach for controlling E. lehmanniana invasions on a more feasible scale by instituting "fertile islands." These islands are an adapted management technique which involve maintaining small patches of persisting native vegetation within the E. lehmanniana monoculture. These microsites often have higher soil moisture, different soil characteristics, or resilient individual plants that can compete with E. lehmanniana. Resource Management employees identified areas with native species, applied different combinations of treatments, and are monitoring which treatments result in the highest increase of biodiversity. These fertile islands will facilitate an increase in native plant diversity of the landscape, an increase in native seeds in the seed bank, a decrease in E. lehmanniana seeds in the seed bank, a decreased fire susceptibility and continuity, and restoration of natural ecosystem function.

Keywords

Invasive Species, Restoration

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An Assessment of Stormwater Project Improvement Opportunities at Santa Monica Mountains NRA (SAMO)

What will I get out of this?

I will describe a transferable, systematic process by which the Park evaluated and prioritized opportunities to improve stormwater runoff quality and quantity.

**Abstract** 

This presentation will describe the process by which potential water quality improvement projects on SAMO properties were identified, evaluated, and prioritized. This effort is one component of a larger parkwide effort toward improving water resources management within the National Recreation Area, which also includes a revision of the water quality monitoring protocol. The following process steps will be described in detail: (1) A regulatory assessment of streams within the Park, including listed impairments and applicable TMDLs; (2) Development of an inventory of NPS properties and initial list of priority sites; (3) Field visits to all major NPS properties, starting with the priority sites (4) Refinement of the project list and prioritization based on both impact and feasibility considerations.

Keywords

water, runoff, streams

Lead author / Session organizer

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Managing the Future: Developing Spatial Decision Support Systems to Assist National Parks Manage Climate Change

What will I get out of this?

The audience will learn how decision support systems can be used to support Parks in planning for the management and adaptation to climate change.

**Abstract** 

Keywords

GIS, Decision Support

Climate change is a major issue currently facing National Parks. Spatial Decision Support Systems (SDSS) can be an invaluable tool for park managers to approach climate change. SDSS will help make thoughtful and effective decisions regarding the impact of climate change on a park. SDSS combines the spatial abilities of a Geographic Information System (GIS) with a decision support system (DSS). The integration of spatial information in a DSS framework makes SDSS an indispensable tool for national park managers. SDSS can provide various future scenarios and predictive models to help managers plan for the future of their park. Managers can use a SDSS to assess the impact of climate change on the ecology of their park and also the impact on the visitors. The robustness and flexibility of a SDSS helps park managers keep the mission of the park service in mind when planning for climate change.

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**7895** Invited Speakers

Climate change adaptation in the NPS: emerging approaches for resources, infrastructure, operations, and visitor experience

What will I get out of this?

Parks are at various stages of climate change adaptation. Assessing this diverse 'landscape' and fostering dialogue on the topic will refine and facilitate future efforts.

**Abstract** 

Climate change impacts all aspects of park management from natural and cultural resource protection to park operations and visitor experience. Climate change adaptation is a relatively new and rapidly evolving arena of conservation, and this Compass Session assesses and shares where National Park Service (NPS) adaptation is, where we want to go, and what we'll need to get there. Invited speakers provide an NPS-wide summary of adaptation planning and actions, share key examples from specific parks and landscapes, and outline current capacity and potential future directions. Following presentations, we wish to engage the audience in a discussion of adaptation and how we can refine our efforts to manage under continuously changing conditions.

Keywords

adaptation, climate, uncertainty

Lead author / Session organizer

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Additional authors / organizers

Gregor Schuurman; Ecologist, Climate Change Adaptation; Climate Change Response Program, National Park Service

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here Taking stock of NPS climate change adaptation: trends, achievements, and lessons learned

Gregor Schuurman; Ecologist, Climate Change Adaptation; Climate Change Response Program, National Park Service

Climate change adaptation for fire-adapted landscapes in the Southern Sierra Nevada

Charisse Sydoriak; Chief, Division of Resources Management and Science; Sequoia & Kings Canyon National Parks

Coastal parks in a seascape of climate change planning in the San Francisco Bay Area

Sarah Allen; Ocean and Coastal Resources Program Lead; Pacific West Region, National Park Service

Enhancing Adaptive Capacity in Rare/Endangered Native Hawaiian Plant Populations in a Changing Climate Jeffrey Mallinson, Biologist, Haleakala National Park

Continuing NPS climate change adaptation: building capacity, harnessing partnerships, and refining approaches Nicholas Fisichelli; Ecologist, Climate Change Adaptation; Climate Change Response Program, National Park Service

**7876**Panel Discussion

## Science with Citizens: An Update on the Dragonfly Mercury Study

What will I get out of this?

The GWS provides the perfect venue to meet with this interdisciplinary team to discuss scientific advances, emerging issues, and the future of this successful program.

**Abstract** 

The citizen scientist study of mercury in dragonfly larvae is approaching its fifth consecutive year of sampling in the national parks. The project blends students with scientists, park interpreters with resource managers, and mercury with dragonfly larvae. Mercury is a potent neurotoxin that threatens resources and values the NPS is mandated to protect. To date, over 45 park units have participated, contributing over 1,000 dragonfly larvae samples, 300 citizen scientists, and 1,800 volunteer hours. The collection of dragonfly larvae is facilitated by the park and conducted by the citizens, and samples are sent to labs at the University of Maine, Dartmouth College, or the U.S. Geological Survey for analysis of mercury. Findings shed light on the risk of mercury contamination in the national parks. Join project coordinators and park staff for an information sharing session on ideas, improvements, and insights as the project attracts a wider audience and expands influence.

Keywords

mercury, dragonfly, citizen

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Sarah J. Nelson

#### The Big Picture on Mercury

Colleen M. Flanagan Pritz

Putting the "bio" in "biogeochemist" - tracing mercury from air to water to biota

Sarah J. Nelson

Interpreting dragonfly larvae as "biosentinels"

Ann Rodman, Branch Chief, Physical Sciences Yellowstone NP

Understanding resources and values using dragonfly larvae

Regina Rochefort, Science Advisor, North Cascades National Park Service Complex

Engaging citizen scientists at Acadia National Park to collect dragonfly larvae

Michael Marion, Lead Education Ranger, Acadia National Park

**7854** Invited Speakers

## Ecological response and recovery of Northeast coastal national parks to Hurricane Sandy

What will I get out of this?

Hurricane Sandy substantially altered several national parks, but they were found to be ecologically resilient, recovering quickly in the months and years following the storm.

**Abstract** 

Hurricane Sandy was one of the largest Atlantic hurricanes on record and it resulted in significant changes to coastal national parks in the Northeast Region. Extensive research on the ecological responses to this major disturbance is underway and this session will present updates on a range of studies. The comparative storm resilience of the natural environment to the built environment was instructive, showing that natural resilience in absence of shoreline infrastructure is stronger than altered shorelines. Resources are managed in the context of both natural and altered shorelines and research on topics from dune migration to water quality is helping to support management decisions about recovery projects. Some of these projects will be highlighted in the preceding session.

Keywords

hurricane, ecosystem response

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If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are

given here

Overview of multiple studies assessing the response and resilience of coastal parks to Hurricane Sandy

Charles Roman, North Atlantic Coast CESU Coordinator, Northeast Region, National Park Service

Metrics of Dune-Beach System Evolution, Gateway National Recreation Area, NPS

Norbert Psuty, Professor Emeritus, Rutgers University

Understanding Morphologic Response and Recovery to Quantify Geomorphic Resiliency of Barrier Island Beaches: Fire

Cheryl Hapke, Research Geologist, U.S. Geological Survey

Response of Great South Bay ecology to a Hurricane Sandy created breach through Fire Island

Christopher Gobler, Professor, Stony Brook University

Visionmaker Jamaica Bay: Sharing visions of ecological resilience after Hurricane Sandy

Eric Sanderson, Senior Conservation Ecologist, Wildlife Conservation Society

Restoration of rocky intertidal habitats in San Francisco Bay damaged by Cosco Busan oil spill

What will I get out of this?

Audience will learn about the natural resource damage assessment process as well as the restoration planning process that was associated with a recent oil spill

**Abstract** 

In November 7, 2007, a tanker collided with the Bay Bridge causing 203 cubic meters of Intermediate Fuel Oil to spill into San Francisco Bay. Three National Park Service units were affected: Golden Gate National Recreation Area, San Francisco Maritime National Historic Park, and Point Reyes National Seashore. 155 hectares of rocky intertidal habitat were injured, with most of the injury occurring within the central San Francisco Bay. Impacts were documented to Fucus gardneri, a rockweed common to the mid-intertidal shoreline within the San Francisco Bay. Restoration planning activities are underway to help recover F. gardneri at sites within central San Francisco Bay. As a first step, shoreline surveys were conducted during the summers of 2012-2013 to map the occurrence of the rockweed to determine potential donor sites. Of the 151.73 km of rocky shoreline within central San Francisco Bay, F. gardneri covered 32.16 km of shoreline.

Keywords

restoration, rockweed

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## BioBlitz 2014: Engaging a Diverse Audience in Exploring the Diversity of GGNRA

What will I get out of this?

Audience members will learn about how GGNRA implemented a successful bioblitz event and how parks can harness the power of citizen science through bioblitz events.

**Abstract** 

In March 2014, Golden Gate National Recreation Area (GGNRA) hosted the National Geographic Society–National Park Service BioBlitz. This 24 hour, all taxa biodiversity inventory is held each year in a different National Park in collaboration with the National Geographic Society. The Golden Gate BioBlitz was a resounding success with record numbers in terms of both public engagement and biodiversity documented. More than 2,700 youth participated and approximately 80% of the youth participants were low-income students of color. The GGNRA BioBlitz also engaged over 300 scientists who lead field inventories with both youth and approximately 1,000 members of the public. This group of scientists, students and the public documented a staggering amount of biodiversity: over 10,000 individual observations were made for more than 2,500 different species. This event highlights how citizen science can serve as a tool to engage new audiences while providing important information about park resources.

Keywords

citizen science, diversity

Lead author / Session organizer

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Nancy Caplan - Golden Gate National Recreation Area

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## Wilderness Water Quality in Yosemite National Park: Effects of Backpackers and Stock Use

What will I get out of this?

Attendees will gain understanding of detailed Wilderness use accounting strategies, technical methods in water quality assessment and implications of project results in Wilderness stewardship planning.

**Abstract** 

Human activities in designated Wilderness may pose risks to aquatic ecosystems and water quality. Despite recent studies in small headwater basins, impacts to water quality from Wilderness use remain in question. From 2012-2014 we measured water quality in locations categorized by use type: overnight backpackers, pack stock trail use and pack stock overnight grazing. Samples were collected and analyzed for fecal indicator bacteria (E. coli) nutrients (N, P) and total suspended sediment (TSS) above and below use zones. Additionally in 2014, a park-wide sampling campaign was performed to represent categorical use zones across different elevations. Preliminary results indicate that concentrations of E. coli, nitrate and TSS are significantly (p< .05) higher below pack stock ford sites but not higher below backpacker campsites and pack stock grazing zones. Further analysis will address effects of hydrologic and landscape variables on water quality, and the downstream distance over which impacts persist.

Keywords

water quality, Wilderness

Lead author / Session organizer

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Jim Roche, Yosemite National Park

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## Conservation Easements and their Contribution to Natural Vegetation Protection

What will I get out of this?

Analysis results provide a baseline understanding of how well conservation easements protect natural vegetation in the Conterminous US.

**Abstract** 

In the United States, conservation easements have been increasing the footprint of the protected lands network since the 1980s. To understand the contribution of these voluntary land restriction to protecting habitats within the network we assessed their level of protection of natural vegetation types. LANDIRE Existing Vegetation Type, the Protected Areas Database (PAD-US CBI Edition), and the National Conservation Easement Database (NCED) were used to characterize the current state of natural vegetation in the protected lands network. The data indicates the majority of natural vegetation types are minimally protected by conservation easements but collectively conservation easements protect millions of acres of natural vegetation, including some of the most vulnerable vegetation types. Increasing pressure on the protected lands network by future climate change and land conversion make it imperative to understand what is currently protected to better inform decisions about management and planning in the future.

Keywords

**Conservation Easements, Vegetation** 

Lead author / Session organizer

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Additional authors / organizers

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Mark Nelson, Research Forests with the USFS Forest Inventory & Analysis

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# Trends in Intertidal pH on the open coast of Washington State: Implications for Ocean Acidification

What will I get out of this?

The presentation provides information on pH trends on the outer coast of WA and illustrates how similar monitoring can be implemented in other park units.

**Abstract** 

Ocean acidification has been occurring at an apparently alarming rate over the last decade in the coastal waters of the Pacific Northwest. The 65 mile shoreline of Olympic National Park on the outer Washington coast hosts one of the most diverse assemblages of marine invertebrates and macroalgae on the west coast of North America, with over 750 documented species. These assemblages are at risk due to continued ocean acidification. From 2010 to the present, multi-probe datasondes have been deployed year-round in the intertidal zone at two sites on the outer coast of Washington State in Olympic National Park. These half-hourly, continuous pH data illustrate differential seasonal dynamics, with a summer season (April to September) marked by high variability and a winter season (October to March) marked by relative stability. Primary productivity, freshwater inputs, and nearshore water movements appear to play a role in seasonal pH dynamics.

Keywords

Ocean Acidification, Intertidal

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Additional authors / organizers

William Baccus; Olympic National Park

7000	Marine Ecology
Contributed Papers	
What will I got out of this?	Attendees will learn about recent advances in pollution prevention and detection, monitoring, and climate change
What will I get out of this?	response.
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Lead author/	Steven Fradkin
Session organizer	
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## Mapping Fens and Wet Meadows in Sequoia and Kings Canyon National Parks

What will I get out of this?

This poster will illustrate both the benefits of versioned geodatabase editing and the value of mapping wet meadow and fen features.

**Abstract** 

The Sierra Nevada Network (SIEN) Inventory & Monitoring Program and Sequoia and Kings Canyon National Parks (SEKI) identified and classified target wetland types (wet meadows and fens) within SEKI. A versioned database (ArcSDE) workflow enabled multiple photointerpreters to edit the feature classes simultaneously, and for project managers to provide quality control of the edits. Using a combination of field data and aerial imagery, 2307 wetland features were mapped and attributed in the parks' 3504 km2 (1353 mi2) area. Ground truthing gave an estimated overall accuracy of 83%. The map provides more detail about wetland features than the existing vegetation map, and will have applications in monitoring, compliance, and research. The map has already been used to select study sites for the SIEN Wetland Ecological Integrity monitoring program and to analyze the impacts of SEKI's Wilderness Stewardship Plan alternatives.

Keywords

mapping, wetlands, GIS

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Corie Cann, Inventory and Monitoring Program, Sierra Nevada Network

Jonathan Nesmith, Inventory and Monitoring Program, Sierra Nevada Network

Sylvia Haultain, Sequoia and Kings Canyon National Parks

Paul Hardwick, Sequoia and Kings Canyon National Parks

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## Managing Non-Native Plants in a Cultural Landscape: The Decision Process

What will I get out of this?

Learn about a successful process to screen plants for use in cultural landscapes.

**Abstract** 

In 2010, the Presidio of San Francisco developed a protocol to evaluate landscape plants for use at the park level. Two factors were used to assess invasion risk: 1) whether the species was recorded as invasive elsewhere and 2) whether the species was invasive in similar regions. In addition to invasion risk, the Presidio added cross pollination risk, maintenance and historic compatibility. This process is now used to evaluate each species proposed for use in the designed landscape. Plants are placed on one of three lists: 1) approved, 2) prohibited or 3) approved with conditions. The collaborative process is a model for other parks. The approach is being tested for use in a similar effort for the 12 administrative park units in the National Capital Region. Applying this technique to the National Capital Region is complicated by gradients of development, ecology, and the availability of plant and historical data.

Keywords

Invasives, Cultural Landscapes

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	Demonstrate PCA's work in ecological restoration.
What will I get out of this?	Demonstrate I CA's work in ecological restoration.
Abstract	Participants will be able to view videos demonstrating PCA's work in ecological restauration in various PCA sites.
Keywords	ecological restoration
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## On Belay: An Assessment of the Sport of Climbing

What will I get out of this?

By attending this presentation participants will have a better understanding of the demographics of the climbing population, its limitations, and climber behaviors.

**Abstract** 

The sport of climbing is at a crossroads; it is quickly growing in popularity with the development of national and international competitions and features in popular media. However, in spite of this rapid development there is a lack of research into nearly every aspect of climbing. This presentation reviews a mixed methods study of over 700 climbers and themes that emerged that guide the climber decision making process including stewardship and mentorship, barriers to participation and access, and organizational governance. The paper also introduces the demographic issues the sport is encountering and potential mechanisms of change for both equity and diversity enhancement.

Keywords

Climbing, Access, Diversity

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## Reintroduction of bighorn sheep to the Great Western Divide

What will I get out of this?

The audience will learn of a success story involving a multi-agency effort to move a federally endangered species towards recovery.

**Abstract** 

In the spring of 2014, 10 Sierra Nevada bighorn ewes and 4 rams were reintroduced to the Great Western Divide in Sequoia National Park, where bighorn had been extirpated since the early 1900s. This multiagency operation was a milestone towards the recovery of this federally endangered species. In this presentation I will discuss the planning efforts and studies undertaken by the NPS in the years prior to this project, explain how the field operations, led by the California Department of Fish and Wildlife, took place, and provide an update on the status of the new herd one year post-release.

Keywords

bighorn, reintroduction

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Additional authors / organizers

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7618 Workshop Strategies for Inspiring the Next Generation of Young Conservationists and Scientists in our Parks

What will I get out of this?

Insights and strategies on how to reach, engage, inspire and elevate youth participation in parks, and the value and role of partner relationships.

**Abstract** 

Regarding parks and science, much has changed in the last generation for our youth. Studies indicate that young people today spend half as much time outdoors as their parents did, and an average of seven hours a day with electronic media. The proximity of the Golden Gate National Recreation Area to urban and suburban communities provides many opportunities to connect with local youth. Currently, this park provides a wide range of both introductory and immersion experiences. How successful have these efforts been and what more can park managers do to generate an interest in ecology, a connection to open space and a passion for science? This workshop provides an opportunity to learn directly from the youth themselves, as well as park staff, key educators and park partners who will share their thoughts on developing creative partnerships and engaging youth in our public lands.

Keywords

youth, science, parks,

Lead author / Session organizer

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Neal Ramus, Senior Manager of Careers in Science, California Academy of Sciences

Crima Pogge, Professor, Biology Department, City College of San Francisco

Michele Gee, Chief of Interpretation, Golden Gate National Recreation Area

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## Climate Influences on Beaver Pond Sustainability at Voyageurs National Park

What will I get out of this?

To demonstrate the effects climate change can have on beaver ponds, and the numerous other species that depend on them at Voyageurs NP.

**Abstract** 

The American beaver, Castor canadensis, is a keystone species in Voyageurs National Park (VOYA) located in north central Minnesota. As a semi-aquatic species beaver are vulnerable to the changes in water availability expected as a result of climate change. Recent climate modeling predicts that future climates in many areas will be warmer, have different precipitation patterns, and more extreme precipitation events. Multiple indices were developed to quantify the stability of the beaver ponds over time. The vulnerability of the beaver ponds to predicted changes in climatic conditions has been classified and a GIS map generated showing the relative vulnerability of the ponds. Any adverse effect on beaver populations as a result of climate change may lead to diminished stream water quality, a loss of prey biomass for carnivores, and a loss of beaver wetlands essential for amphibians, waterfowl, and other mammalian species at VOYA.

Keywords

Climate, Beavers, Wetlands

Lead author / Session organizer

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Pests: Deal with it!!!

What will I get out of this?

Through viewing and understanding this poster, participants will learn a tried and true methodology for dealing with any type of pest, structural or landscape.

**Abstract** 

The National Park Service implements an Integrated Pest Management Program (IPM) to reduce risks to people, resources, and the environment from pests and pest related management strategies. The National Park Service uses an 11 Step Process 11 Step Process to Developing and Implementing an Integrated Pest Management Strategy to develop solutions to pest problems. This process is effective for any pest situation. Through planning and consensus building the IPM process ensures decision-makers, technical experts, and site users are engaged to understand specific site management goals. Available tools are reviewed and in accordance with regulations and policy, to develop effective short and long term management strategies. Implementation involves pest prevention, detection, monitoring, setting action thresholds, management and education. All federal agencies are directed under Title 7 USC 136r-1, to implement Integrated Pest Management Strategies in procurement and pest management activities.

Keywords

### **Integrated Pest Management**

Lead author / Session organizer

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Bruce Badzik, Park IPM Coordinator, Golden Gate NRA

# Twenty Years of BAER - A Process that Works

What will I get out of this?

From its infancy, the Burned Area Emergency Response program within DOI has proven itself to be a process that protects life, property and resources.

**Abstract** 

Prior to 1994, the Department of the Interior did very little to address the fire effects to cultural and natural resources. In 1994, the first Department of the Interior Burned Area Emergency Response (BAER) Team responded to a fire for the purposes of assessing the emergency rehabilitation needs of natural, cultural, and infrastructural resources as a result of the effects of fire. The objective of BAER continues to be the protection human life, property, and critical cultural and natural resources. The BAER Plan identifies emergency, short-term treatments necessary for the protection of life, property, and critical natural and cultural resources. Today the BAER program maintains a list of interdisciplinary-interagency team members that can be called upon as a team or as a single resource or any combination. Within the past twenty years the BAER program has produced hundreds of plans recommending emergency stabilization and rehabilitation treatments.

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Fire Management, IPM

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How many salmon are too many salmon?

What will I get out of this?

I hope to focus the issue of the difficulty in defining 'natural' in national parks.

**Abstract** 

Preserving resources within their natural range of variation is a fundamental mandate for national parks in Alaska. While concern over 'unnatural' abundances of park resources often focus on rare or depleted resources, it is equally important to manage unnaturally overabundant resources. Sitka National Historical Park (SITK) faces a similar threat from an unnaturally abundant pink salmon (Oncorhynchus gorbuscha) in the Indian River. In the 1980s, peak abundance estimates varied between several hundred to 20,000 fish but now regularly exceed 400,000, presumably due to the operation of a salmon hatchery nearby. We used collection of salmon otoliths from pink salmon to identify 'straying' rates of hatchery produced salmon into SITK. Estimates varied between 7% and 17% annually, with fish from hatcheries found over 100km from the park. We discuss the implications for managing a park fishery in its natural condition relative to conflicts with alternative objectives from state fisheries.

Keywords

salmon, conservation, marine

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**791**2 **Panel Discussion**  When is wildlife in national parks 'conserved'?

What will I get out of this?

For park managers to effectively 'conserve' wildlife there must first be definitions of what constitutes 'conserved'. Are these definitions based on science or personal values?

**Abstract** 

NPS Management Policy mandates that park managers make decisions that conserve park 'values' which are defined as park resources, such as wildlife, and '...appropriate opportunities to experience enjoyment of those resources' even though park use may have negative impacts on wildlife. Ambiguity in the NPS Management Policies results in significant latitude in interpreting when resources are conserved. We propose a Panel Discussion that focuses on how different parks have defined 'conserved', focusing on wildlife, and the interplay between conserving a park resource vs. conserving a park value. Panelists will provide several case studies involving wildlife in national parks of Alaska that highlight when a management approach may be consistent with conserving a resource but inconsistent with park values. Discussion will focus on sources of conflict when stakeholders can relate to conserving a resource, which is more easily defined and subject to science, than a park value.

Keywords

conserved, wildlife, management

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Science in a landscape shaped by qualitative guidance and emotion: Bear baiting on Alaskan parks Dr. Grant Hilderbrand, Wildlife Biologist, National Park Service

If this is a session of **Invited Speakers** Dr. Joshua Schmidt

Coping with wolf control: making management decisions based on park values

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r Sc	ott G	ende							

7691 **Café Conversation** 

## Creating a Culture of Safety within National Park Service Field Research

What will I get out of this?

Foster communication between groups confronting similar issues in order to share innovations and key observations that stand to improve safety performance.

**Abstract** 

In the summer of 2012, the Pacific West Region of the National Park Service required that all Inventory and Monitoring (I&M) Networks in the region undertake Protocol Readiness Reviews to certify that each monitoring protocol "has sufficient resources and support to implement with full consideration for safety, field logistics, and supervisory oversight." To undertake these safety reviews, Program Managers in each Pacific West Region I&M Network held a series of site visits and meetings with field personnel and supervisors. Lessons learned included logistical themes such as route modification and replacing or upgrading Personal Protective Equipment, but a common theme transcending field conditions and study design was the need for diligent application of well-planned and diverse communication channels. In this session we examine Best Management Practices, review communication technologies, and discuss interdivisional cooperation as a means to create a culture that implements field projects safely.

Keywords

Safety, Communication, Health

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Stacey Ostermann-Kelm, Mediterranean Coast Network Inventory and Monitoring Program Manager

Nita Tallent, Mojave Desert Network Inventory and Monitoring Program Manager

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Data from Golden Gate National Recreation Area's Large Scale BioBlitz – Results and Management Considerations

What will I get out of this?

Given the rise in popularity of promoting citizen science through short term inventory events, this review will help planners navigate bioblitz data management issues.

**Abstract** 

Golden Gate National Recreation Area hosted a National Geographic Society sponsored BioBlitz on March 28-29, 2014. Over 300 scientists led inventory efforts to share field sampling techniques and discuss the values of science with the public while documenting as many species as possible within a 24-hour period. Thousands of people participated and over 12,000 observations of organisms were logged during the event, posing a significant data management challenge. With record keeping and identification techniques varying among taxonomic groups, our team examined several options for data storage and data review. The Golden Gate event partnered with iNaturalist to receive data from mobile devices and broaden the review of photographic evidence to a crowdsourced web platform. This poster will both review the resulting data and provide recommendations for how to manage observation records during future bioblitzes.

Keywords

bioblitz,biodiversity,data

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**7899** Invited Speakers

## Long-range Transportation Planning in the National Park Service

What will I get out of this?

This session will challenge the audience to think about how to incorporate mission-specific topics like visitor experience and resource protection into traditional long-range transportation planning.

**Abstract** 

Long-range transportation plans (LRTPs) are used to prioritize funding and investments for transportation entities across the country. They are legally required for federal land management agencies, which often have resource- or visitor-based missions that require a more interdisciplinary approach to transportation planning. Specifically, the National Park Service manages an extensive transportation portfolio (2.4 billion annual vehicle miles), and must incorporate typical transportation concerns like safety and asset management, as well as mission-specific topics like visitor experience and resource stewardship. This session will provide an overview of LRTPs in the park service, including work that has been done to-date and the future of the program, and will highlight two case studies. The first is the National LRTP, which used an interdisciplinary approach to incorporate mission-based elements into its planning process. The second is the Visitor Experience LRTP Guide, which provides direction for incorporating visitor experience into long-range transportation plans.

Keywords

Transportation, visitor, resource

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#### Overview of NPS LRTP Program

Christine Bruins, Community Planner; NPS Denver Service Center - Planning Division

**Incorporating the NPS Mission: Visitor Experience** 

Rachel Collins, Visitor Use Management Specialist; NPS Denver Service Center - Planning Division

**Incorporating the NPS Mission: Cultural Resources** 

John Gerbich, Community Planner; NPS Denver Service Center - Planning Division

Incorporating the NPS Mission: Natural Resources and Climate Change

Christine Bruins, Community Planner; NPS Denver Service Center - Planning Division

7893
Panel Discussion

## Phenology for the Next Century of Science and Engagement in Protected Areas

What will I get out of this?

We will build on our shared interests and experiences to envision the role of phenology in science, engagement, and conservation in the next century.

**Abstract** 

An understanding of phenology, the timing of life-cycle events, sheds light on biological response to climate change, informs invasive species management, and plays a key role in engaging the public in nature and the scientific process. Phenology monitoring, with both scientific and educational dimensions, is underway at 25 National Parks and National Wildlife Refuges. These diverse efforts provide key lessons and demonstrate the applicability of phenology in resource management while engaging the community. Join us, to learn more via 5 minute lightning talks by each panelist, followed by an open discussion with participants. Our goal is foster discussion to develop a vision for integrating phenology data with natural resource management and science applications. This session provides an opportunity to network with others who are interested in conducting phenology monitoring. Given the expertise on the panel and the opportunity to develop shared vision, this is sure to be a transformative session.

Keywords

#### phenology, citizen science

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Jana Newman, National I & M manager, US Fish and Wildlife Service

Angela Evenden, Senior Science Advisor, Pacific West Region, National Park Service

Alyssa Rosemartin, Assistant Director and IT coordinator, USA National Phenology Network

Tim Watkins, Science and Education Coordinator, Climate Change Response Program, National Park Service

#### Spring Forward: Taking phenology to the next level at natural protected areas

Alyssa Rosemartin, Assistant Director, USA National Phenology Network

Building a state-wide phenology network: Lessons learned from the California Phenology Project

Dr. Angela Evenden, Senior Science Advisor, Pacific West Region, National Park Service

Citizen Science and phenology monitoring: The underutilized tools in our toolbox

Dr. Jana Newman, National I & M manager, US Fish and Wildlife Service

#### The Appalachian Trail: a case study in unifying phenology monitoring across eleven degrees of latitude

Dr. Tim Watkins, Science and Education Coordinator, Climate Change Response Program, National Park Service

7794 Freestanding — no

## The National Natural Landmarks (NNL) Program

What will I get out of this?

National Natural Landmarks (NNLs) are owned by a variety of land stewards, participation in the program is voluntary; there are no restrictions placed on landowners.

**Abstract** 

The National Natural Landmarks (NNL) Program was established to encourage and support the voluntary conservation of sites that illustrate the nation's geological and biological history, and to strengthen the public's appreciation of America's natural heritage. The program offers participants the opportunity to share information, solve problems cooperatively, and conserve important natural areas. Since its establishment in 1962, the NNL Program has involved private, municipal, state, federal, and other landowners working together to conserve natural resources. National Natural Landmarks are selected for their outstanding condition, illustrative value, rarity, diversity, and value to science and education. NNLs include public and private lands with a wide variety of uses. The NNL designation is made after in-depth scientific study; all new designations must have owner permission. Currently, there are 597 National Natural Landmarks throughout the United States and its territories, which includes 99 NNLs within the Pacific West Region of the National Park Service.

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NNLs, natural, landmarks

Lead author / Session organizer **Steve Gibbons** Cooperative Conservation Specialist

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Oak woodland restoration at Whiskeytown: meeting resource and fire management objectives with a GSA-Timber Sale

What will I get out of this?

A case study is presented for an oak woodland restoration project in Whiskyetown, which was accomplished through a GSA Timber Sale

**Abstract** 

The goal of the Boulder Creek Thin was to restore 75-acres of conifer-encroached oak woodland while minimizing implementation costs. Park managers have documented how the lack of frequent and low intensity fire has enabled the park's oak woodlands to transition from sunny and open conditions, to dense heavily-stocked forests. This shift in composition and structure has resulted in oak mortality and decreased understory biodiversity; lacking intervention, these oak woodlands will not persist. Recognizing these substantial changes over a short time period, park managers have developed a restoration strategy that incorporates a GSA Timber Sale to meet restoration objectives with minimal cost, while providing jobs and materials to the local economy. In doing so, the park hopes to reduce the adverse impacts associated with future fire events, improve the health of the old growth oaks and conifers, and to facilitate future prescribed fire operations.

Keywords

thinning, black oak

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Climate change trends in U.S. national parks for vulnerability analyses and management plans

What will I get out of this?

Participants will learn of new climate change data for the 401 national parks and the application of information to individual parks.

**Abstract** 

Analyzing climate change vulnerability and adapting management plans comprehensively across the U.S. national park system requires consistent climate data across all parks. We conducted spatial analyses of historical and projected climate at 800 m spatial resolution across the U.S. and analyses of each of the 401 U.S. national parks. From 1895 to 2010, temperature increased in the system at a significant rate of 0.9 ± 0.2°C per century and precipitation decreased on half of system area. The five parks with the highest rates of temperature change are in Alaska, Guam, and Hawaii. New downscaling of IPCC projections show projected temperature increases of 2.1 to 5.9°C and precipitation increases on 94 to 100% of system area. Vulnerability analyses indicate that up to half of system area is highly vulnerable to biome shifts. Summary reports for individual parks are facilitating adaptation of Foundation Documents and other management plans to climate change.

Keywords

climate change, vulnerability

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Herbicide Ballistic Technology: A Case Study of Applied Research, Partnerships, and Innovation Protecting Watersheds

What will I get out of this?

Innovation in exotic plant management resulted in development of Herbicide Ballistic Technology (HBT), a novel application mitigating damage caused by invasion and protecting natural areas.

**Abstract** 

Herbicide Ballistic Technology (HBT – i.e. herbicide-filled paintballs) is an innovative pesticide application system for surgically administering small aliquots of herbicide encapsulated into soft-gel projectiles that are pneumatically propelled with an effective range of 30 m to target. This herbicide delivery system was developed in Hawaii in a collaborative partnership. The product is a registered 24(c) Special Local Need pesticide. It is used for surgically targeting satellite populations of highly invasive, exotic miconia (Miconia calvescens). Miconia is colonizing remote parts of the 55,000 ha East Maui Watershed, threatening Haleakala National Park. The East Maui Watershed is inaccessible to ground-based operations. Our best utility for HBT is with aerial surveillance operations on a helicopter platform. Since becoming operational in 2012, we have conducted >50 destructive monitoring missions with ~300 hrs of operational flight time; dispatching >10,000 targets. Dramatic increases in efficiency and efficacy have been realized while significantly reducing herbicide use.

Keywords

Innovation, Paintball, Invasive

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## A Tale of Two Heritage Areas: Making Sense of the Past to Shape the Future

What will I get out of this?

Provide examples from Europe and USA of best practice in heritage areas and lessons as to the critical inputs required for a successful heritage area.

**Abstract** 

The heritage area ideal provides the model for the preservation and engagement of communities in protected landscapes. This paper compares the approach taken to heritage preservation in two regions - the Lackawanna Heritage Valley in Pennsylvania, USA and the former "HERIAN" project in Wales, UK - using each as an example of the wider approach to heritage areas in the USA and Europe. Both areas sought to tell the story of their industrial heritage and created a heritage tourism product with the aim of stimulating economic and social regeneration. The paper considers the origins and structure of each heritage initiative, their similarities and differences, and identifies the elements of best practice that can be exchanged, particularly in regard to community engagement. As National Heritage Areas increasingly face an uncertain funding situation, this paper ultimately draws on the comparison to identify the critical criteria required for NHAs to survive and succeed.

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heritage, tourism, community

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# Natural Resource Education and Outreach in a Cultural Resource Park: expanding the audience

What will I get out of this?

Will learn about an approach to outreach and education with minimal staffing, collaboration between natural and cultural resources, and outreach to diverse audiences.

**Abstract** 

The historic significance of Manassas is the primary interpretive theme for the park. However, the park's 5,000 acres are becoming more significant as a natural resource site due to rapidly increasing urban development in the surrounding area. This situation however, does offer opportunity, as the park provides easy access for local schools and educational groups and is an ideal location from which to study natural processes. In 2013 we began a 4-year initiative with the goal of increasing the awareness and subsequently the use of the park for education and recreation. Some accomplishments to date include; establishment of two "Track Trail" self-guided tours, a park specific brochure that connects our cultural and natural resources, a cell phone tour that contains Virginia Standards of Learning information, partnerships with local schools, and outreach to local pediatrician offices. Future plans include handicapped accessible trails, Spanish versions of all brochures and citizen science projects.

Keywords

education, collaboration, outreach

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A Social Science Perspective on Sustaining Stewardship by Connecting People and National Parks

What will I get out of this?

Participants will be encouraged to think about the complex social and human challenges facing national park stewardship and ways to address these challenges.

**Abstract** 

Keywords

given here

social dimensions

In an increasingly diverse America, ensuring continued support for national park stewardship rests on understanding and nurturing at least five interrelated connections between people and protected areas: 1) social construction, 2) trusteeship, 3) enjoyment, 4) cultural identification, and 5) "tracks through time." Since the Yosemite Grant of 1864 planted the seeds of the national park idea in the U.S., some connections between people and parks have flourished. But other connections have ruptured or were never made in the first place. In a society facing rapid demographic and social change, sustaining all five connections presents challenges. Increasing the public's support for park stewardship in the twenty-first century will depend on successfully nurturing these relationships. This will require creative thinking about what national parks are, how they interact with their surrounding regions, and how they can connect with the broadest spectrum of the American public.

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## Multi-dimensional Topographical Monitoring in Coastal Parks and Refuges

What will I get out of this?

Responsible resource management practices can be greatly benefited by the periodic monitoring of highly dynamic coastal ecosystems.

**Abstract** 

Coastal systems are among the most dynamic ecosystems and require periodic monitoring to assist in resource management decisions. The National Park Service and the Fish & Wildlife Service have adopted a long-term program to monitor topographical change within coastal areas of the Northeast. Protocols have been developed to identify the seasonal, annual, and long-term trends and variability as a basis for understanding the coastal geomorphological system. There are several important metrics that are monitored using GPS equipment with sub-meter accuracy: one-dimensional shoreline position change, two-dimensional beach-dune profile displacement, and three-dimensional volumetric fluxes. These metrics contribute to annual and long-term trend reports that provide critical information on the geotemporal evolution of coastal systems. Currently, these protocols are utilized within 19 National Wildlife Refuges, 4 National Parks, and 1 National Estuarine Research Reserve. Additionally, the GIS datasets resulting from these efforts are maintained in a national geodatabase.

Keywords

GIS, topography, monitoring

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## The role of education in influencing wilderness values and management

What will I get out of this?

Learn how education – even small amounts – can influence managers' knowledge, attitudes, and values about wilderness which can lead to better wilderness management.

**Abstract** 

Managers often use education to influence wilderness users behavior as they strive to provide unconfined recreation. Some managers (particularly those who have wilderness as a collateral responsibility) may not have formal training in wilderness stewardship; thus, increasing their wilderness knowledge can lead to better wilderness stewardship. This study examines five years of pre and post tests of a Wilderness Values "test" in a wildland recreation management class to illustrate areas where value shifts – sometimes dramatic ones – are common. In some cases students change from biocentric to anthropocentric, while in other cases they switch from anthropocentric to biocentric. This study helps show that increasing knowledge can affect managers' values which can fundamentally shift their efforts to maintain an untrammeled wilderness while allowing anthropocentric uses of wilderness.

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wilderness, education

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7867 Workshop

## A Cultural Resources Toolkit for Marine Protected Area Managers

What will I get out of this?

This session will demonstrate the online cultural resources toolkit, facilitate discussion of ideas and content for its expansion, and solicit feedback from attendees via survey.

Abstract

Keywords

and titles of their presentations are given here **MPA**, Cultural Resources

Most marine protected areas (MPAs) have a focus on natural resource protection, and many mangers and staff lack training and tools for managing cultural resources -- which include the broad array of stories, knowledge, people, places, structures, and objects (together with their associated environment) that help to sustain cultural identity. These include, for example, shipwrecks, submerged archaeological sites, and areas of importance to indigenous peoples. To develop and deliver this information and tools, the MPA Cultural Heritage Resources Working Group is producing a virtual toolkit for cultural resource management, with particular focus on MPAs. This session will demonstrate the toolkit and solicit feedback. Topics include a Cultural Landscape Approach for integrated management of cultural and natural resources, assessment and management planning, stakeholder engagement, outreach and interpretation, tribal and indigenous communities, research and data collection, monitoring and evaluation, intellectual property and sensitive information, climate change adaptation, disaster preparation, and underwater archaeology.

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## **Ground Truthing the Travel Time Cost Surface Model**

What will I get out of this?

We use field collected data to refine geospatial inputs for Travel Time Cost Surface Model. Modeled results will improve allocation of financial and environmental resources.

**Abstract** 

The travel time cost surface model (TTCSM) is one tool that has been used by I&M networks to guide long-term monitoring planning, including field logistics and costs. TTCSM estimates travel time via least-cost paths using geospatial data, such as roads, trails, digital elevation models, and land cover. The cost surface takes into account the sum of the assumed impedance to maximum driving and walking speed from each geospatial layer to estimate travel times. Real world travel times and paths will vary from the model outputs based on the assigned impedance values for these data. We compared field crew geospatial data (walking paths and time) to the TTCSM results in order to examine and refine the impedance values for the various TTCSM inputs. The more realistic TTCSM has lead to greater efficiency in planning field work and resource use, lessening environmental impacts.

Keywords

Groundtruth, Model, Travel-costs

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Nita Tallent - NPS, Mojave Desert Inventory and Monitoring Network

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## **Monitoring Riparian and Aquatic Vegetation in Arid Land Springs**

What will I get out of this?

This project report will present proven and tested methods for collecting data on aquatic and riparian vegetation in arid land springs.

**Abstract** 

In the desert southwest, springs and the adjoining riparian areas are an important resource providing habitat for wildlife and are critical areas of high biodiversity. The National Park Service's Southwest Network Collaborative (SWNC) has identified riparian vegetation as a 'vital sign' to be monitored in spring ecosystems across the southwest. The SWNC has developed a scalable methodology for monitoring riparian vegetation species richness in an effort to measure change—between visits to a specific site, across a park, and across the desert southwest. These methods emphasize scalability, ease of implementation, and the capacity to detect vegetation change. This project report summarizes the SWNC program, exploring the impacts of different levels of monitoring effort, and presents preliminary results, while suggesting next steps for improving monitoring effectiveness and the ability to detect change.

Keywords

Springs Riparian

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John Spence, Senior Scientist, National Park Service

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## **Implementing Park Science**

What will I get out of this?

Participants will know where to access resources to design professional development plans and how to most effectively use the Career Academy for Natural Resources.

**Abstract** 

The National Park Service "Call to Action" directs the development of Career Academies to enhance professional and organizational excellence. Over the past several years individual career fields have been working to create discipline specific, competency-based learning opportunities. The Career Academy for Natural Resources development is being led by the Training Manager for Natural Resources with subject experts and university partners. The academy framework provides a structure for organizing learning opportunities based on natural resource essential competencies at the developmental, journey and advanced levels. The effort continues with collaboration of specialists and program managers from around the service. A new course, Implementing Park Science, is being designed to support professional development that increases scientific capacity, teamwork, collaboration and creativity. This presentation will focus on the Career Academy for Natural Resources Foundational Series and the Implementing Park Science course. It will also address professional development planning to maintain professional currency and networks.

Keywords

### training, professional development

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## **Population Dynamics of the Santa Rosa Island Torrey Pine**

What will I get out of this?

24,192 Torrey pine trees were counted on Santa Rosa Island during our study. Revealing that CINP holds 80% of the naturally occurring population.

**Abstract** 

The Torrey pine (Pinus torreyana) is the rarest pines species in North America, with its' current population limited to San Diego, CA and Santa Rosa Island (SRI), CA. In total, 24,192 individuals make up the SRI Torrey Pine population, only 3,068 of which are sexually mature. The proportion of juveniles to adults for SRI is 8:1, compared to San Diego's 1:2. Smaller, younger plants are more frequently located on the edges of the groves, while larger, older plants make up the groves. Core samples were taken from 19 trees to find a relationship between DBH and age in order to estimate the how old each plant is. We are continuing to monitor the survival and growth rate of the juveniles in 45 permanent monitoring plots. With non-grazers removed from the island in 2012, this study provides baseline data to quantify the ongoing recovery of the Santa Rosa Island Torrey pine.

Keywords

Demography, forestry, island-endemic

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Park visitor brand awareness: Examining the effectiveness of World Heritage, park agency and destination brands

What will I get out of this?

Learn about visitor awareness of World Heritage and other park brands; build effective communication for your agency or park.

**Abstract** 

This presentation reports on park visitors' awareness and recall of the World Heritage (WH) brand. More than 800 Canadian and US visitors to four southern Alberta World Heritage sites were surveyed. This study contributes to our understanding of how to manage and communicate public sector conservation brands.

In this study visitors' ability to recognize and recall the meaning of the World Heritage logo as well as other prominent conservation logos including the US NPS and Parks Canada's logos were documented. Visitor understanding of why the parks they were visiting were designated as important cultural and natural heritage sites was also assessed. Finally, links to regional destination promotional efforts were examined through visitor's knowledge of these promotional campaigns. Findings from this study provide insights for communications and education efforts undertaken by conservation agencies charged with managing these and other heritage sites.

Keywords

World Heritage, communication

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### Lessons Learned When "Sacred" bumps into "Profane" in Mountain Protected Areas

What will I get out of this?

From case studies of collisions between metaphysical values and damaging development, some recommendations are made that may reduce future conflict in protected areas

**Abstract** 

This presentation attempt to derive lessons from seven global case studies of special places in mountain protected areas where sacred or cultural values did, did not or only partially did prevail against damaging development. These mountain sites are: Olympus, Kailash, Sinai, Cairngorms, Adams Peak, Tongariro and Uluru. Most of these are in legal status as National Parks or other kinds of formal Reserves, yet this does not assure their integrity when economic development looms. Several suggestions are made to enhance the mantle of protective conservation. Implications for Devil's Tower, San Francisco Peaks, Grand Canyon??

Keywords

Sacred/cultural sites

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# Nature-based Recreation and Latino Engagement in Boulder County: Moving Towards Increased Social Equity

What will I get out of this?

Nature-based agencies need to be working towards greater inclusiveness of its citizens. This study provides insight into what agencies can do to be more inclusive.

**Abstract** 

Boulder County "smart growth" based policies have helped create a very livable and highly desired community for residents. One of the main pillars of its "smart growth" efforts is open space. But there are social equity concerns in terms of disproportionate visitor underuse by minorities, as visitor use is skewed towards Caucasians at these nature-based open space parks. Past research has shown differences between minority and majority populations in their preferences for recreation activity type and preferred settings for outdoor recreation. This qualitative study of 18 park and non-park participants learned what is working, what didn't work, and what local agencies and organizations should be doing more of in terms of engagement of Latino's and possible preferred methods of nature-based recreation by Latinos. The insights from this study can further the ability of a nature-based agency/organization to provide desired amenities and programs for use by Latino community members.

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Keywords

nature-based, equity, recreation

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### **Scaling Up - Large Landscape Conservation**

What will I get out of this?

Participants will learn about how the NPS is "Scaling Up" its work with large landscape conservation.

Abstract

Our national parks, trails, heritage areas and landmarks reflect our nation's history. Our parks preserve history, lands, waters, and wildlife across diverse landscapes - and they attract millions of visitors. Whether urban or rural and large or small, the preservation of these places depends upon connectivity—linkages with neighboring places and people. Their future depends upon shared goals by people working together across large landscapes. The need for scaling up large landscape conservation is greater now than ever before. These efforts require management tools and skills in collaboration, coordination, mediation, and facilitation of dialogue. They call for knowledge-building to include information at varying scales relevant to managing water, adapting to changing climate, protecting wildlife or historic resources. The NPS needs to work with its partners across communities and landscapes to develop governance structures and processes that strengthen dialogue, support shared actions, and enhance coordination.

Keywords

large landscape conservation

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7730 Panel Discussion

# The Way Forward for California State Parks; Implementing the Findings of the Parks Forward Commission

What will I get out of this?

Discussion of the findings and implementation of the California Parks Forward Initiative, addressing financial, operational, and cultural challenges facing State Parks.

**Abstract** 

The session will be a panel discussion on the findings and implementation of a new vision for California State Parks, the Parks Forward Commission report. Over the course of 18 months, an independent commission made up of experts, advocates and thought-leaders conducted a wholesale assessment of the park system. This independent process was designed to address the financial, operational, and cultural challenges facing State Parks to ensure the system's long-term viability. In the fall of 2014, the Parks Forward Commission adopted a long-term plan for a State Park system that meets the needs of all Californians, now and in the future. The panel will delve into the execution of the plan, and its broader relevance to park systems throughout the United States.

Keywords

**Parks Forward Commission** 

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Steve Szalay

Member, California Parks Forward Commission

Caryl Hart

Member, California Parks Forward Commission

Hawk Rosales

# From Mammoths to Missiles: A Cultural Resource Overview of White Sands National Monument

What will I get out of this?

Audience members will learn about the density and diversity of cultural resources at the monument; which include unique archaeological sites found nowhere else on Earth.

**Abstract** 

White Sands National Monument's gypsum dune filed is more than a geological marvel with breathtaking vistas. Although, the environment appears inhospitable and uninhabitable, the monument protects a numerous and diverse array of cultural resources that provide evidence of over 10,000 years of human history and visitation. People have been drawn to the largest gypsum dune field in the World for many different reasons overtime including prehistoric hunting and gathering as well as historic ranching, mining, military activity, and recreation. The physical properties of gypsum create a time capsule when heated, preserving dateable charcoal, bone, pollen, and other cultural material; producing unique archaeological sites called "hearth mounds" that are not found anywhere else in North America and possibly the world.

Keywords

Archaeology, Cultural Resources

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Time Capsules in the Sand: Unique Archaeological Sites Preserving Human History and the Prehistoric Environment

What will I get out of this?

Learn about techniques employed in studying prehistoric sites currently found nowhere else on Earth and the insights gained into past climate and land use patterns.

**Abstract** 

Keywords

Archaeology, Geomorphology, GIS

Cultural sites known as "hearth mounds," scattered throughout the gypsum dune field at White Sands National Monument in south-central New Mexico, are providing additional insight into human habitation and subsistence strategies within the Tularosa Basin. These unique sites contain the remains of prehistoric thermal features that transformed the surrounding gypsum sediments into a hardened material similar to plaster of Paris; preserving dateable cultural material and strengthening our understanding of the prehistoric environment and dune dynamics. This paper explores formation processes that influence the spatial and temporal relationships between Middle Archaic through Pueblo period (4300 BC – AD 1450) sites and presents the results from an experiment designed to replicate simple cooking facilities described ethnographically for Mescalero Apache and other southwestern pueblos. The data collected provide a more robust understanding of thermal feature morphology, firing episodes, site function, resource availability, recycling strategies, the dune movement relationship, and a site's preservation potential.

•	
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### Measurement and Characterization of Motorcycle Noise in Park Environments

What will I get out of this?

They will learn the distinctions between noise from different types of motorcycles ridden through national parks and will understand how distance affects the noise characteristics.

**Abstract** 

Keywords

presentations are given here

Motorcycle, noise, propagation

Many park visitors travel through parks on motorcycles, which have noise dominated by engine combustion and exhaust noise. Because motorcycles have a wide variety of engine displacements, numbers of cylinders, maximum engine speeds, and exhaust designs, motorcycles cannot be grouped into a single category when characterizing their noise. In order to characterize motorcycle noise better and to accurately predict noise propagation, noise emissions of 115 motorcycles from four motorcycles categories (cruiser, sport, dual purpose, and touring) were measured. The sound levels of the four categories were modeled as a function of speed and their spectral characteristics were compared. The measurements were also used to modify a version of the Federal Highway Administration's Traffic Noise Model in order to predict sound levels at distances from 50 to 5000 feet. It is expected that accounting for these differences will help park managers improve the management of motorcycle noise in their jurisdictions.

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#### Vibration of Natural, Historical, and Ancient Structures

What will I get out of this?

They will gain a basic understanding of issues related to vibrations of natural and ancient structures and how to mitigate risks.

**Abstract** 

Natural structures, such as rock arches and bridges, as well as ancient and historical dwellings under the protection of the National Park Service (NPS), are irreplaceable. Federal agencies have a vested interest in understanding how anthropogenic activities affect these structures and in identifying mitigation measures to reduce or eliminate impacts. This paper provides a basic primer on the topic of structural vibrations of natural and ancient structures caused by land and airborne vibration sources. A basic overview of structural vibrations is presented in order to provide a foundation for discussion of vibration related issues. Details are provided on ground and airborne sources of vibration. Methods to quantify structural responses to vibratory input are presented and mitigation strategies are discussed. An NPS annotated bibliography of vibration references is introduced. Two case studies are also reviewed from the literature to provide practical examples.

Keywords

Vibration, natural, ancient

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### Aztec Ruins National Monument Heritage Garden

What will I get out of this?

This project fosters stewardship of cultural and natural resources, it provides opportunity for visitors have a valuable, hands-on learning experience within the Heritage Garden.

**Abstract** 

Now in its third year, the Aztec Ruins Heritage Garden is a demonstration project focused on prehistoric agriculture, which has been in the greater Southwest U.S. for more than four millennia. The concept for the garden is based on archeological, ethnobotanical, and historical research at Aztec Ruins National Monument, the Four Corners region and beyond. More than 1,000 visitors have had opportunity to experience plants that were grown and used at Aztec Ruins when it was occupied 900 years ago. Visitors to the garden are introduced to natural and cultural resource stewardship concepts, and hundreds of volunteers have assisted in caring for the garden through planting and harvesting. The rich biological and cultural histories promote engagement with the local ecology, and foster understanding of subsistence agriculture. The garden's key concepts are relevant today, such as adaptation to changing climate conditions, limited water availability, and sustaining crop biodiversity for the future.

Keywords

prehistoric agriculture, ethnobotany, resource stewardship

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**7850** Day-Capper

### We Have a Story to Tell

What will I get out of this?

A short play about the quest to incorporate interpretation of Piscataway culture at Piscataway Park will frame a discussion of how parks interpret cultural landscapes.

**Abstract** 

Beginning with a reader's theater performance of "We Have A Story To Tell," a 20-minute play that explores the Accokeek Foundation's efforts to highlight the history and culture of the Piscataway people at Piscataway Park, this interactive session will explore the challenges of interpreting the multi-layered stories of cultural landscapes. For the Accokeek Foundation, that challenge is rooted in many factors, from the organizations' founding to preserve the view from George Washington's Mount Vernon, to its interpretation of colonial history in a predominately African American county with an important slavery story to tell, to its relationship with the Piscataway people who finally gained state recognition in 2012. The performance will serve as a springboard for learning how parks are incorporating stories that have in the past been marginalized. How can landscapes help us tell these stories in a way that engages visitors and honors the communities whose stories are told?

Keywords

landscapes, stories, indigenous

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#### Status and Trends of Sierra Nevada Network Lakes

What will I get out of this?

We will share data analysis techniques applicable to status and trend monitoring programs. Sharing these methods has been identified as a need by I&M.

**Abstract** 

The Sierra Nevada Network (SIEN) monitors high-elevation lakes throughout Sequoia, Kings Canyon, and Yosemite National Parks as part of the National Park Service's Inventory and Monitoring Program. We present SIEN's first six years of lake chemistry data (2008-2013) and report on the status and trends of Sierra Nevada Network lakes. We focus on nutrients, nutrient ratios, and acid neutralizing capacity from SIEN's 18 water quality metrics. The SIEN lakes design is a generalized random tessellation stratified (GRTS) design where sites are sampled annually (n=8) and on a four year rotation (n=68). Our results showcase status estimate and trend methods developed for spatially-balanced probabilistic sampling designs that include serially-alternating augmented panel structures.

Keywords

lakes, monitoring, methods

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Assessing the Vulnerability of Salt Marsh Habitat to Sea-Level Rise in Jamaica Bay, New York

What will I get out of this?

How to evaluate climate change resilience in salt marsh. Demonstrates youth and volunteer contribution to park natural resource management.

**Abstract** 

Conservation and restoration of salt marsh within Jamaica Bay is a high priority for Gateway National Recreation Area and its partners. Over the past 100 years, the Jamaica Bay ecosystem has lost 92% of its salt marsh habitat. Within any given estuary, salt marsh vegetation can exist within a specific elevation range that is dependent upon the tidal range of the system. We captured marsh surface elevation and vegetation characteristics using RTK-GPS and modified Braun- Blanquet scale to determine the elevation of salt marsh and growth range of Spartina alterniflora within Jamaica Bay. HOBO water level loggers were deployed to determine site specific tidal data. Through an analysis of tidal records and acquisition of site specific tidal and marsh elevation data, modeling will identify which marshes are most vulnerable to submergence and which marshes are most likely to keep pace with projected accelerating rates of sea-level rise.

Keywords

marsh, sea-level, elevation

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# Enhanced Florida Bay protection and experiences – how active stakeholder participation secured the new vision

What will I get out of this?

A controversial marine zoning concept gained strong support with compelling science, implementing a pilot project, using adaptive management, and extensive dialogue with key stakeholders.

**Abstract** 

In developing Florida Bay's long-term management direction, park managers and stakeholders worked together over many years to identify a strategy for better protection to this unique 400,000-acre shallow-water estuary occupying the southern portion of Everglades National Park, while allowing for enhanced recreational pursuits. Strategies included creating increased awareness of Bay-resource issues, developing new stewardship measures for this world-renowned area damaged by decades of improper boating, and establishing extensive marine area zoning to improve resource- and visitor-use conditions. Building blocks to success for this component of the General Management Plan were 1) developing sound scientific data that the public understood, 2) implementing a pilot project to test the zoning concept before GMP completion, 3) using adaptive management to fine-tune the pilot project, 4) investing substantial time with stakeholders to identify potential solutions in many locations on the Bay that posed resource and visitor-use challenges (areas considered make-or-break issues for plan success).

Keywords	resources, stakenolaer consensus
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Growing Future Resource Managers While building Bridges Between Native Communities and National Parks.

What will I get out of this?

This case study outlines the grass roots development of Native Conservation Corps (NCC), an immersive experience for native youth participating in NPS resource management.

**Abstract** 

Native Conservation Corps meets the Call to Action, "Stop Talking and Listen" by building bridges between native communities and National Parks. Developed at PEFO in 2011 the program has grown to include other NPS sites. Native youth live in national parks and engage in natural resource and interpretive work. While caring for and interpreting park resources, including archaeological sites considered significant to their communities, participants serve as ambassadors for their native communities by sharing aspects of their culture with NPS staff and visitors. Once they return home participants serve as ambassadors for the NPS by sharing what they learned about park resources and career opportunities with their communities. Examples of projects include vegetation monitoring; habitat restoration; petroglyph assessment and monitoring; and wildlife inventorying. Participants have returned to lead later corps and gone on to study law enforcement, range management, and other NPS related fields.

Keywords

native, youth, nps

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Todd Hisaichi is an Interpretive Park Ranger at Muir Woods National Monument. Todd co-designed Native Conservation Corps (NCC) while working as a ranger at PEFO.

Lonnie Pilkington is a Natural Resources Program Manager Glen Canyon National Recreation Area (GLCA). Lonnie has led NCC at GLCA for 3 years.

Science in a landscape shaped by qualitative guidance and emotion: Bear baiting on Alaskan parks

What will I get out of this?

We integrated scientific and humanities approaches to inform decisions relative to a contentious issue emphasizing facts and logic rather than emotion and vague guidance language

**Abstract** 

The State of Alaska recently authorized the harvest of brown bears over bait in several Alaskan NPS units. This allowance was prohibited by NPS through the compendium process but also elevated the issue of the harvest of black bears over bait on these same units, a practice allowed since the designation of many of the Alaskan Parklands. Two fundamental questions were the potential ecological effects of this harvest practice on natural systems and behaviors and the potential incongruence of this practice with educational and public safety messaging regarding feeding of wildlife. We integrated scientific (harvest data analyses) and humanities (conservation ethics/argument analyses) methodologies to inform decision-making on this contentious issue. The regulation addressing bear baiting in Alaskan NPS units was published in the Federal Register in Summer 2014 and NPS is presently conducting public meetings and evaluating public comments with a final rule expected prior to the 2015 GWS.

Keywords	bears, ethics, harvets
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7542
Panel Discussion

### **Putting Benefits Sharing to Work for Parks**

What will I get out of this?

Researchers and park staff learn how commercial application of research results from authorized research on park resources leads to benefits sharing and improved resource preservation.

**Abstract** 

Learn about National Park Service benefits sharing! When research originating under NPS permits or other authorizations results in an invention with a commercial application, parks may negotiate monetary or other benefits. Such benefits sharing improves conservation of park resources and enhances public benefits from research in parks. Parks develop agreements to share or decline benefits when entities notify parks of proposed commercial uses. Although new to NPS, "access and benefits sharing" has been of interest to the international community for many years.

Keywords

benefits-sharing, research, permits

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Legal Authority, Fundamental Legal Concepts, and Early Development of NPS Benefits Sharing

Carla Mattix, Attorney Advisor, Office of the Solicitor, Department of the Interior

Key Features of NPS Benefits-Sharing Policy and its Significance for Permitted Researchers and Park Staff John Dennis, Deputy Chief Scientist, National Park Service

From the Benefits-Sharing Handbook: Tools for Initiating and Managing Benefits Sharing

Ann Hitchcock, Senior Advisor Scientific Collections and Environmental Safeguards, National Park Service

The Nature of Benefits and Agreements to Share Benefits

Linda Drees, Chief, Partnership and New Initiatives Branch, National Park Service

### **Invasive Plant Management Planning – Technical Considerations**

What will I get out of this?

Learn about a resource to assist in the invasive plant management planning process.

**Abstract** 

Management of non-native invasive plant species is a persistent concern for natural and cultural resource managers of parks and protected areas. Many land managers have identified invasive plant management planning as a high priority need. The National Park Service's Biological Resources Management Division has prepared a technical report to aid resource managers in developing an invasive plant management plan. This poster presentation will highlight some aspects of that report to enable audience members to gain new insights into best practices for invasive plant management planning, situation analysis, setting priorities, and major components of a comprehensive invasive plant management program.

Keywords

invasive plant, planning

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# Management Assessment Points: A Bridge Between Science and Management in Southwestern Parks

What will I get out of this?

A tested framework for presenting research and monitoring results in a context that supports resource management decisions and actions will be presented.

**Abstract** 

The NPS has built a world-class monitoring program, yet effective integration of research and monitoring results into park management remains a major challenge in meeting our mission. One approach – management assessment points – has been widely implemented in parks of the American Southwest for several years. We will present the conceptual basis for this approach, demonstrate its application in a park management context, review successes and challenges thus far, and discuss avenues for future development and evolution of the approach to parks and other protected lands across a variety of scales and resource management themes.

Keywords

I&M, science, management

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Cheryl McIntyre (Physical Scientists, NPS Chihuahuan Desert Network)

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### Law and National Parks: Bringing Managers and Legal Scholars Together

What will I get out of this?

Protecting park values often means defending them, and understanding legal framework and context is essential. Share the enthusiasm when park managers and legal scholars collaborate.

**Abstract** 

Over the past several years, the University of Notre Dame Law School has promoted interaction between national park superintendents and environmental law scholars to discuss our common work with respect to the management of national parks. The national park superintendents have appreciated the surprisingly rare opportunity to discuss park management issues with colleagues and legal scholars, while the academics have greatly benefited from learning more about how the law shapes managers' decisions. In these gatherings, topics have ranged broadly from biodiversity and wilderness mandates to relations between the NPS and Congress, the courts, and state/local governments. This goal of this session, therefore, is to establish an informal working group of NPS managers and law professors and to forge a plan for further collaboration. Possible initiatives could include an informal legal consulting group for NPS managers, as well as research and problem-solving projects for law professors and their students.

Keywords

Law

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Bob Krumenaker (Acting Superintendent, Nat'l Park Service, Everglades & Dry Tortugas Nat'l Parks)

### CityArchRiver 2015

What will I get out of this?

Through extraordinary public-private partnership, CityArchRiver 2015 and the National Park Service are transforming the St. Louis Arch Grounds.

**Abstract** 

As a partner architect for the Museum of Westward Expansion and the lead architect for the NPS Ranger Station and Old Courthouse accessibility improvements, Trivers Associates is helping to navigate this transformative effort. Originally constructed in 1965, the Gateway Arch has long been isolated from downtown St. Louis - separated primarily by a depressed arterial highway. This project seeks to integrate the Gateway Arch into the fabric of the region, building connections to downtown and the river to create a more meaningful visitor experience. The poster will depict the overall project and highlight Trivers Associates' specific experience.

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preservation, architecture, construction

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### Old Courthouse Accessibility Improvements — St. Louis, Missouri

What will I get out of this?

As the selected architects for the Old Courthouse, Trivers Associates had to navigate between two often opposing priorities - providing accessibility while maintaining historic integrity.

**Abstract** 

Creating accessibility within the confines of a historic structure while also maintaining historic integrity is a difficult but necessary modern design challenge. In this case study, exterior ramps have been designed keeping the Secretary of the Interior's Standards for Rehabilitation in mind: retain historic character, avoid removal of distinctive materials, differentiate new construction from old, and provide a solution compatible with historic materials, features, proportions and massing. In addition, if removed in the future, the intervention will maintain the essential form and integrity of the historic property and its environment. This case study outlines the design process, attributes, and details of the selected design.

Keywords

architecture, accessibility, preservation

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A novel application of GPS and sensor data exploring micro-level displacement among Yosemite wilderness visitors

What will I get out of this?

New methods for studying micro-level site displacement are presented. Different conclusions from spatial and survey data question the effectiveness of surveys to study displacement.

**Abstract** 

Micro-level site displacement is a behavioral coping mechanism that occurs when visitors respond to undesirable conditions, like crowding, by altering their use of a location. We explored whether two types of sensor data, personal GPS units and infrared trail counters, could be used together to document the occurrence of micro-level site displacement at three locations in Yosemite Wilderness. We also compared visitor self-reports (n=59) of crowding to actual displacement behavior under different use densities. Ripley's K and nearest neighbor hierarchical cluster analyses were used to determine differences in cluster patterns between point data at high, moderate, and low use levels. Micro-level site displacement was documented from geospatial data. However, no differences were found between reports of the impact of crowding on experience and displacement occurrence. These findings contribute new methods for studying micro-level site displacement and add to the discussion on the effectiveness of using visitor surveys in recreation-related research.

Keywords

displacement, GIS, wilderness

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# Understanding day hiker trail choice decision making in Yosemite Wilderness: development of a typology

What will I get out of this?

This study used a qualitative approach to understand the process of trail choice among wilderness day hikers in Yosemite; implications for communication are proposed.

**Abstract** 

Using a qualitative approach informed by bounded rationality and information search theory, we studied the process used by wilderness day hikers to decide which trail to visit. Semi-structured interviews (n=80) were conducted with day hikers on three high use and three moderate use trails in Yosemite National Park Wilderness. Interviews sought to identify information sources considered, constraints to decision making, and selection strategies used by hikers in making their trail choice. Seven hiker types emerged from a combination of theory-based coding, constant comparison coding, and matrix coding, providing a comparison of types across participant attributes, decision strategy used in trail selection, and sources of information consulted. Data show that diversity exists in the way that day hikers make trail choices; however, trail features, convenience, and use of decision heuristics were recurring elements in decision making across types. Theoretical implications are discussed, and recommendations for hiking information provision are made.

Keywords

decision making, wilderness

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Moving beyond simple trend detection: putting the why back into monitoring

What will I get out of this?

We discuss how monitoring programs tend to focus on "counting books as the library burns" and share our successful "bet hedging" approach to design.

**Abstract** 

Conceptual models are emphasized in monitoring program development. Conceptual models capture the state of knowledge on drivers and stressors that could affect resource condition. However, program objectives are often focused only on simple trend detection of resource condition rather than on assessing the hypothesized relationships described by the conceptual model. Consequently, the statistical elements within a protocol (and analysts) focus on maximizing power for trend detection. This creates an inferential disconnect when the monitoring data do not also provide information on the hypotheses conveyed in the conceptual model, leading to potentially disappointing outcomes for managers. We discuss the inherent tension within monitoring programs to balance the need for regional trend estimates in resource conditions with the desire to understand why conditions are changing over time. We illustrate this tension with case studies and provide examples and suggestions to move beyond simple trend detection and put the "why back into monitoring."

Keywords

statistics, design, trend

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Kristin Legg, Greater Yellowstone Monitoring Networks, National Park Service, Bozeman Montana

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9990	Species as Heritage
Paper	
at will I get out of this?	
Abstract	Species conservation and area based conservation have evolved in parallel. There are many species whose spatial conservation needs extend beyond individual protected areas. Several such species are part of the history, culture and identity of people who share landscapes and habitats with them. Efforts to promote a notion of "heritage species" as a tool for international co-operation have so far not met with much success. Existing international legal instruments such as the World Heritage Convention (UNESCO) or the Conservation of Migratory Species (UNEP) do not provide sufficient frameworks to combine ecological and historical data and analyses that would be needed to establish and promote heritage-species research and conservation. In this presentation efforts to promote the notion of "World Heritage species" as part of UNESCO contributions to the implementation of the UNESCO-UNEP Great Ape Survival Project (GRASP) are briefly reviewed. Lessons learned from that example and emerging trends in the implementation of international conventions, agreements and programs are used to explore alternative pathways to promote collaborative research on heritage species and their conservation.
Keywords	species, heritage
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### **Monitoring Herpetofauna Using Wildlife Cameras**

What will I get out of this?

Repurposing wildlife cameras to monitor herpetofauna with an emphasis on engaging youth in citizen science to better understand the status and ecological importance of herpetofauna.

**Abstract** 

In FY 14-15, the newly established Desert Research Learning Center, managed by the Sonoran Desert Inventory & Monitoring Network, developed a protocol implementing infrared cameras to monitor herpetofauna. Commonly herpetofauna monitoring at sites is usually contracted out to experts and once the study is completed minimal efforts are made to monitor herpetofauna for status and trends. Many methods include installing pitfall traps where mortality rates were high, and surveys are time consuming to capture the optimum time. With wildlife infrared cameras becoming an inexpensive way to monitor resources with minimal impacts, we are also seeing these pictures as popular tools to communicate important conservation messages. A big focus of the protocol was working with collaborating non-profit, The Ironwood Tree Experience, to develop the project as a citizen science tool for their Field Science for Schools program, where middle to high school students connect with ecosystems through field experiences.

Keywords

Herpetofauna, Wildlife Cameras

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Vulnerability assessment of ecotourism to climate change in Dana Biosphere Reserve, Jordan

What will I get out of this?

The study aims to assess the impacts of climate change on eco-tourism in Dana Biosphere Reserve, which is the most diverse ecosystems in Jordan.

**Abstract** 

This study aims to assess the vulnerability of ecotourism to climate change in Dana Biosphere Reserve, Jordan. The researcher investigated to understand climate change threats, implications, and adaptation methods to cope with threats by conducting semi-structured interviews with stakeholders. Findings reveal that Dana is exposed to different climatic stresses: drought, decreased precipitation, and increased temperature that create several implications on Dana's ecotourism systems regarding environment, local communities, and tourism demand and activities. Climate change causes several environmental problems: degradation of water resources, biodiversity loss, and habitat fragmentation. It also changes the lifestyle of local communities. With respect of tourism, climate change leads to a shift in camp season and an increase in trail and facility damage. The study confirms that Dana has an effective adaptation on both ecological and socio-institutional; Dana' sustainable management and the diversity of ecosystems and climatic zones are key components in reducing vulnerability to climate change.

Keywords

Climate change, eco-tourism

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### Implementation of Improved Cave Management Practices at Coronado National Memorial

What will I get out of this?

Coronado NMem is implementing an improved cave management program including outreach, restoration, white nose syndrome response, and collaboration with other regional cave managers.

**Abstract** 

In FY2014, Coronado National Memorial received funds to improve cave and karst management and develop WNS response. The memorial has a fledgling program that has remained dormant for many years. Coronado Cave is one of several caves in the park and is open to visitors as a wild cave experience. Park staff sough to employ a series of monitoring and restoration activities as well as develop outreach and educational opportunities regarding caves. We are partnering with other local cave parks to improve our regional understanding of similar karst in southeast arizona.

Keywords

Caves, Karst, WNS

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Developing New Cultural Landscape Approach-Based Historic Contexts for Submerged, Intertidal, and Shipwreck Cultural Resources

What will I get out of this?

Educate audience members about specific types of cultural resources, potential historic contexts, and maritime cultural landscape-based interpretive themes in their parks.

**Abstract** 

Submerged, intertidal, and shipwreck cultural resources offer unique challenges for National Parks that include or are adjacent to marine or aquatic places. The dynamic nature of coastal environments makes protecting cultural resources especially challenging. The task is made more difficult by the confusing nature of coastal park boundaries and a lack of consensus over what constitutes significant maritime cultural resources. Working in tandem with the NPS Northeast Regional office, investigators from the University of Rhode Island have been developing new cultural landscape approach (CLA) based historic contexts designed to aid park managers identify significant cultural resources and new maritime-associated interpretive opportunities consistent with NPS Historic Thematic Framework. The presentation addresses the fundamentals of the CLA approach and discusses representative contexts, observations, and interpretative opportunities based on case studies of the St. Croix River International Historic Site and the George Washington Birthplace National Monument.

Keywords

Landscapes, Cultural, Archeology

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Roderick Mather is Professor of Maritime History and Archaeology at the University of Rhode Island. His work combines Atlantic history with archaeology and cultural resource management.

Integrating Traditional Ecological Knowledge into Resource Management and Research at Pinnacles National Park

What will I get out of this?

The audience will hear about a project that has successfully incorporated traditional ecological knowledge into resource management and research.

**Abstract** 

In December 2011, an important cultural and ecological process was reignited in Pinnacles National Park when the Amah Mutsun Tribal Band gathered alongside agency fire crews and land managers to burn a two-acre stand of native deergrass (Muhlenbergia rigens). Throughout California, indigenous people traditionally burned selected areas to manage and promote food and fiber. This project is unique in that it incorporates two distinct knowledge systems and invites an indigenous perspective in park research and management. From the project's beginning, tribal partners participated in establishing research questions and goals. Tribal members, and especially tribal youth, regularly participated in collecting data and implementing treatments. The burn is one of several highlights of this integrated program at Pinnacles that aims to gain a better understanding of California Indian management practices and its role in shaping the landscape over centuries of time, and how this awareness influences today's management.

Keywords

TEK, deergrass, fire

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Rick Flores, UC Santa Cruz Arboretum

Sara Reid, UC Berkeley

Restoration of a California grassland through intensive yellow starthistle control and native perennial bunchgrass reintroduction

What will I get out of this?

The audience will learn about a successful grassland restoration project that includes a strong monitoring and experimental framework that has guided implementation of the project.

**Abstract** 

Keywords

invasives, restoration, grasslands

Since 2009, Pinnacles National Park has been actively restoring 140 acres of a highly degraded grassland and valley oak savannah system newly acquired in 2006. Restoration and research efforts include testing native bunchgrass re-vegetation methods, integrated pest management techniques to control YST, and extensive monitoring and mapping of target species, along with plant community response to treatments. Management techniques included prescribed burning, broadcast herbicide application, timed mowing, goat grazing, and manual hoeing or pulling with multiple partners, inmate crews and volunteers. These varied methods and consistent treatments over five consecutive years have successfully decreased YST populations to significantly less than 1% cover, and protected adjacent private and park lands from infestations. Based on knowledge and results gained from these efforts, the park is undergoing larger-scale drill-seeding with locally derived native perennial grass seed.

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### Targeting Priorities for Ecological Restoration in the Merced Wild and Scenic River Corridor

What will I get out of this?

This is an example of a highly-scrutinized planning effort that succeeded and how resource managers guided ecological restoration prioritization to benefit river-related habitat.

**Abstract** 

The Merced River hosts unique and highly-valued features, coursing through extensive designated Wilderness and the famed Yosemite Valley. After years of litigation and planning efforts, Yosemite National Park completed the Merced Wild and Scenic River Comprehensive Management Plan, which integrates recreation and resource values. By approaching the corridor as a whole, we were able to look at its hydrogeomorphic connection to riparian and meadow systems to plan and prioritize restoration actions alongside other values. Yosemite Valley required a most intricate look into the balance of use and restoration of ecological function. Through redevelopment of key visitor services and identification and prioritization of critical restoration areas, the park can enhance resource outcomes. The first phase of ecological restoration implementation targets removal of infrastructure within a designated riparian buffer and riverbank restoration. Key floodplain, riparian and meadow habitat will be reconnected to the river and its natural processes for protection and enhancement.

Keywords

restoration, riparian, meadows

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Linda Mazzu, Yosemite National Park

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7792 Workshop

### Learning by Listening: Oral History and Narratives of Wilderness

What will I get out of this?

Through training in interviewing skills audience members will learn how oral history can help them better understand the complex past and future of wilderness areas.

**Abstract** 

Using case studies from Yosemite, Sequoia and Kings Canyon, and the Selway-Bitterroot, this workshop introduces practical how-to oral history techniques and explores how human stories and oral history are especially important to our understandings of wilderness landscapes. Although national parks have existed since 1872, the special "wilderness" designation is much more recent. Legislated in 1964, the Wilderness Act famously states that wildernesses are "untrammeled by man." Yet, long before the act, wildernesses were trammeled in fascinating narrative ways. What is the best method to document and preserve the human stories of these areas that are protected from human development and human impact? How can we use those personal stories to educate about and guide resource management? Through hands-on training in interviewing skills and multiple uses of oral history sources, audience members will learn how oral history can help them better understand the complex past and future of wilderness areas.

Keywords

Oral history, wilderness

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//6/ Paper	
What will I get out of this?	Audience will learn about the changing resources of the Arctic and how climate has driven those impacts.
Abstract	Sea ice records have been monitored since 1979, and have shown a progressive decline in total area covered by sea ice. Sea ice is particularly important to the Arctic region, dominating the ecological and economic development of the region. As sea ice has retreated, it has opened up the region for further resource extraction and marine transportation, increased coastal erosion by limiting shorefast ice armoring, changed or limited subsistence hunting opportunities, and necessitated a significant focus on resource protection from previously nonexistent oceanic disturbances and threats including marine incident preparedness and increased need for understanding the ecology of now at risk coastal systems, which are also undergoing rapid change.
Keywords	Ice, climate, coast
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Additional authors / organizers	Peter Neitlich, Ecologist, Western Arctic Parklands, National Park Service
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### Japanese tsunami debris response efforts and impacts in National Parks

What will I get out of this?

Audience will learn about the ramifications of tsunami and marine debris in Parks including monitoring efforts, removal challenges, and hazards.

**Abstract** 

On March 11, 2011 a magnitude 9.0 earthquake struck off the northeast coast of Japan generating a tsunami that created approximately 1.5 million tons of marine debris with the potential to be transported across the northern Pacific Ocean to the west coast of North America. The National Park Service has responded to the debris with monitoring efforts, removal projects, and invasive species studies. To date, Parks, through partnerships with a variety of organizations, have removed several tons of debris, monitored hundreds of miles of coastline using different techniques, and cooperated with scientists in identifying over 90 non-native species attached to marine debris that include docks, boats, and buoys that have washed ashore in US National Parks.

Keywords

debris, tsunami, marine

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Sarah Allen, Oceans and Coastal Programs Coordinator, Pacific West Region, National Park Service

### Limitations of geographic response strategies in northwest Alaska

What will I get out of this?

Audience will learn about the necessity for field truthing geographic response strategies and understanding nearshore currents to better protect trust resources.

**Abstract** 

Geographic Response Strategies (GRSs) in Northwestern Arctic Alaska are relatively currently being developed and established with the oldest draft plans to date selected in 2010 with completed drafts in 2011. In 2011 and 2012, a northwest ecological risk assessment and scenario planning exercise was conducted with many recommendations including testing of the GRSs. In 2013 the NPS was able to do a small pilot test of waters within Ikpek lagoon in Bering Land Bridge. Results indicated that the current GRS design would likely not be effective; furthermore, the tidal currents associated with interior lagoon dynamics indicated that there was a high potential for marine transport in unanticipated directions within the lagoon. This science has lead to a partnership to test most of the GRSs within the Northwestern Arctic coastal parks.

Keywords

GRS, currents, Alaska

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# Visitor Support for Yellowstone National Park: The Psychological and Behavioral Relationships

What will I get out of this?

Attendees will hear new insights in understanding who supports parks and how to connect visitors to parks, a critical issue in protected area management.

**Abstract** 

Recently, financial and budgetary constraints have impacted the US' National Park System. In an effort to build constituency, a call has been made to provide transformative visitor experiences in all national parks. An online study was conducted in the summer of 2014 with four samples of previous Yellowstone visitors to understand their level of park support and what drives support behaviors. Five psychological and behavioral constructs were measured to test their relationship with park support including: place attachment, recreation involvement, geotouristic tendencies, and autobiographical memory. Results indicate that visitors who are highly place attached, possess high-impact memories, engaged in outdoor activities, and have strong geotouristic behaviors are more likely to support Yellowstone. New psychological frameworks like autobiographical memory are important in identifying experiences important to visitors. Park managers can use this information to better understand their visitors' experiences and to measure park support within their specific site.

Keywords

Support, Yellowstone, Experience

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**7856**Café Conversation

Innovation: What it really means and why we should care—A hands-on workshop for leaders to help drive innovation

What will I get out of this?

Attendees will learn through engaging stories of leading innovators, hands-on activities, and open dialogue how to recognize, build, and apply effective and exciting innovation principles and tools.

**Abstract** 

We hear it everywhere: innovation leads to success. But what does "innovation" really mean, and how can we best use it in our work? Attendees will learn through engaging stories of leading innovators, hands-on activities, and open dialogue how to recognize, build, and apply effective and exciting innovation principles and tools.

Keywords

Innovation, management, leadership

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The Anthropocene versus Climate Change as a Conceptual Framework for Addressing **Global-Scale Stressors** 

What will I get out of this?

Attendees will better understand the advantages and disadvantages of replacing climate change with the Anthropocene as a conceptual framework for addressing large-scale stressors.

**Abstract** 

The Anthropocene Era concept provides a better conceptual framework than climate change for communicating and addressing global-scale stressors. Climate change is not "the" large-scale threat to us and to our planet. There is also nitrogen deposition, air pollution, freshwater and ocean chemistry changes, and a host of other stressors that act in synergy with it. By contrast, the notion that we have entered the Anthropocene Era integrates global-scale threats. It captures their interrelatedness, the totality of their effects. The provocative Anthropocene Era concept is also vivid and meaning-laden, with an introspective, ethical dimension. It engenders questions about generational justice and the future we want for the planet. Increasingly, people are indifferent to climate change. At a time when many are suspicious of or baffled by its underlying science, the Anthropocene Era has greater potential to bring people to what needs to be the conservation paradigm of the future--Earth-System Stewardship.

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Anthropocene climate change

Lead author / Session organizer

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Internet Presence and Social Media Perceptions and Usage by Visitors to Crater Lake National Park

What will I get out of this?

Participants will learn about the emerging trends in social media perceptions/preferences at national parks. Managers can use these insights to develop more effective communication strategies.

**Abstract** 

Emerging technologies such as social media could serve as a valuable communication tool for federal, state and local recreation resource management agencies. Research into visitor demographics, preferences and technology usage while at managed recreation areas is needed to identify and develop effective communication and outreach strategies. Utilizing data collected through on-site surveys, we examined the use of social media by visitors to Crater Lake National Park, USA. Data were collected on pre-trip social media usage as well as identified preferences for distinct types of preferred content delivered through specific social media platforms. Results indicate clear content-platform preferences. There was notable demand for information about recreational opportunities and the park's cultural resources from image-based platforms (Instagram and YouTube). Other notable content-platform preferences are also discussed. Further research could investigate whether these trends are generalizable to visitors of other national parks.

Keywords

social media, NPS

Lead author / Session organizer

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FFI: A monitoring database linking science and management

What will I get out of this?

We will describe the FFI monitoring database and the ways that managers and scientists can use these long-term vegetation and fuels data for multiple purposes.

**Abstract** 

FFI (FEAT/FIREMON Integrated) is an interagency-supported database application designed to help meet monitoring needs and encourage data sharing and analysis. While primarily developed for fire effects monitoring, the application and data are valuable for helping to strengthen the connection between science and resource management. Since the initial FFI application release in 2007, over 300 vegetation and fuels databases and spreadsheets from federal and non-federal agencies have been converted to FFI, a SQL-server database. The National Park Service (NPS) stores all of the agency's FFI databases on the IRMA Data Store, a web-based service for data and information related to NPS natural and cultural resources. The FFI databases can be discovered by managers and scientists interested in exploring the long-term data for research or communication purposes. These databases can also be merged and used to create reports across geographic and administrative regions, helping to answer monitoring and management questions.

Keywords

monitoring, fire effects

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Philip van Mantgem, US Geological Survey, Western Ecological Research center

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An Experimental Investigation of the Effect of Minimum Impact Education on Visitor Behavior

What will I get out of this?

This study uses experimental methods and Global Positioning System (GPS) tracking technology to examine the efficacy of minimum impact education strategies in managing visitor behavior.

**Abstract** 

Visitor education programs aim to manage recreation impacts that, left unmanaged, can result in unacceptable changes in resource conditions and quality of visitor experience. In this study, four different on-site minimum impact education strategies were applied on the trails and summit area of Sargent Mountain in Acadia National Park, Maine. Treatment conditions (signs and a personal contact) encouraged visitors to stay on marked trails and minimize off-trail travel. Treatment efficacy was evaluated using Global Positioning System (GPS) tracking of visitor behavior on/off trails. Spatial analysis of GPS tracks revealed statistically significant differences among treatments, with the personal contact resulting in significantly less dispersion of visitors on the mountain summit. Results also indicate that the signs deployed in the study were ineffective at limiting off-trail use. These findings suggest that personal contact by a uniformed ranger or volunteer may be the most effective means of delivery for on-site minimum impact education.

Keywords

**Visitor education** 

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**8137**Poster

# Water relations of Baccharis pilularis seedling establishment in a changing climate

What will I get out of this?

Our results suggest Baccharis pilularis should be managed in order to preserve coastal grasslands in central California.

**Abstract** 

Baccharis pilularis (Asteraceae, coyote brush), a woody shrub native to California, is invading favored coastal grasslands in central California, including grasslands in Golden Gate National Recreation Area, Muir Woods National Monument, and Mount Tamalpais State Park. In light of expected warmer and drier conditions with climate change, we compared B. pilularis seedling water relations in areas of high fog, cool temperatures and low fog, warm temperatures, with and without neighboring grassland species. There was no difference in how seedlings responded to water deficits as measured by water potential, and seedlings thrived in low-fog, warmer areas. In high-fog, cooler grasslands, B. pilularis seedlings used more fog water when neighboring grassland species were present, indicating seedlings use fog water harvested by neighboring plants. Our results suggest that land managers should actively manage B. pilularis encroachment in order to preserve California's coastal grasslands.

Keywords

grassland, invasive, fog

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<u> </u>

# Current Status and Recent Change in Residential Development around Lake Roosevelt National Recreation Area

What will I get out of this?

We report monitoring results on parcel-level residential development around Lake Roosevelt National Recreation Area, including methods that are extensible to other parks and protected areas.

**Abstract** 

Lake Roosevelt National Recreation Area is a 130-mile long reservoir spanning 4 counties in eastern Washington and surrounded mostly by private land. To quantify development over time, we observed the status of parcel zoning using NAIP aerial imagery from 2006, 2011, and 2013. In each year, all residential parcels within 1-kilometer of the park (4008 parcels, 13476.4 acres) were observed to either match the residential zoning status (i.e., developed), or were observed to not match the zoning status (i.e., developable). A total of 2245 parcels (56%) were observed developed in 2006. From 2006 to 2013, development occurred in 419 parcels (10.4%). In 2013, the two northernmost counties possessed the largest number of developed parcels (Ferry, 95.5%; Stevens, 98.5%), followed by Grant (94.7%) and Lincoln (82.4%) counties. We conclude with discussion of opportunities for ongoing monitoring of residential development and how results may inform park planning.

Keywords

Development, Land-use, Zoning

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### Wilderness and Historic Preservation: A Case for Storied Landscapes

What will I get out of this?

The audience will learn how cultural resources fit within the Wilderness Act, and understand how this informs current controversies over managing cultural resources in Wilderness.

**Abstract** 

This paper introduces a new framework for addressing cultural resources in Wilderness. It presents a contextual history of wilderness and historic preservation on federal public lands, and a brief policy analysis augmented by discussion of the four court cases pertinent to the issues. A new typology of wilderness heritage values is presented, drawing from principles, theories and concepts of both historic preservation and wilderness. These values are integrated into parameters and restrictions of the Wilderness Act to support a new framework for managing cultural resources in Wilderness. The paper closes with recommendations for new directions in managing America's cultural heritage in Wilderness.

Keywords

Wilderness, Historic, Cultural

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**7956** Panel Discussion

Protecting Sacred Places in National Parks: Traditionally Associated Peoples and Consultation

What will I get out of this?

The National Historic Preservation Act plays a critical role in protecting cultural resources on Federal land. Consultation with traditionally associated people improves understanding and stewardship.

**Abstract** 

The First Amendment, American Indian Religious Freedom Act, the National Historic Preservation Act (NHPA), and Executive Orders 13007 and 13175 provide traditionally associated peoples with special rights, and Federal Land Managers with special obligations. These include the right of access to religious or sacred sites, the responsibility to manage and protect sacred places, and processes to ensure consultation. In particular, the NHPA requires Federal agencies to consult with traditionally associated people to understand their perspective on agency uses or actions. Consultation is the first step in project development and program planning. Misunderstandings easily arise from lack of early consultation, or and consultation that inadvertently leaves out important consultation partners. The voice of the traditionally associated people must be heard and understood to protect cultural resources, especially those with sacred or religious values, on federal lands.

Keywords

Consultation, Protection, Planning

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Manager, Pacific Island Office of NPS

Melia Lane-Kamahele

The biological consequences of climate change on high-elevation amphibian populations

What will I get out of this?

This work provides an assessment of the biological implications of changes in wetland hydrology expected with climate change on montane amphibians in the Pacific Northwest.

**Abstract** 

An essential aspect to the continuing success of protected areas, such as national parks, is understanding species responses to climate change. Amphibians, as a globally threatened group, represent a particular priority for mitigating the effects of climate change, which is expected to act synergistically with other threats to exacerbate declines. To address this, we monitored >35 Cascade frog (Rana cascadae) breeding sites within Olympic and Mt. Rainier National Parks that span a range of hydroperiod types and quantified the proportion of reproductive effort that was lost as a result of pond drying. We will use these data, along with existing demographic data and site-specific predictions of warming and drying, to explore how climate change will affect R. cascade. These results can then be used to pinpoint specific areas within national parks in which climate change will threaten stability and identify priorities for climate mitigation with respect to montane amphibians.

Keywords

amphibians, climate change

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**8270**Poster

Romanticism in urban landscapes: How investment in urban parks helped re-image the City of Chattanooga

What will I get out of this?

Participants will learn about how the parks and green spaces can contribute to the rebirth of a city.

**Abstract** 

The romantic preservation movement is credited with helping preserve many parks and wilderness areas in the U.S.A. The philosophy behind romanticism espoused respect for nature and enhancement of its integrity as opposed to fear for nature and the attempts to conquer it. What if those same principles of reverence for nature and ecological integrity were integrated into urban landscapes? There is increasing recognition of the role of proximity to nature in enhancing the wellbeing and quality of life and thus an effort to enhance and bring back green infrastructures urbanized areas. Residents and visitors use such spaces for recreation, connection with nature and also for educational purposes. This research looks at the role of urban parks and other green infrastructures in the rebirth of the City of Chattanooga, TN, once the "dirtiest city in America." Findings suggest that investment in environmentally-sensitive recreation amenities were pivotal in re-imaging the city.

Keywords

Wellbeing, Parks, Chattanooga

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# The Impact of Dialogic (Two-Way) Interpretation: A Multi National Park Study

What will I get out of this?

Participants will learn long term impacts of dialogic interpretation at six National Parks. Will learn if (and how) these programs impacted visitor knowledge and attitudes.

**Abstract** 

This presentation will share the mixed method (qualitative and quantitative) assessment of dialogic (two-way) formal and informal interpretive experiences conducted at six National Parks in the summer of 2014. Topics associated with these experiences included specific park related resource issues along with climate change information. Short and long term impacts of these visitor experiences will be presented along with the assessment of the use of two-way interpretation and associated interpreter skills. Levels of knowledge retention and attitude change related to the park site resource issues and climate change will also be presented. The results of this multi-park study will help participants understand the strategies associated with two-way interpretation and which aspects of such an approach had the most impact on visitors. Scenarios from each of the park's programs will be shared to help achieve the presenters' goals.

Keywords

Interpretation, Visitor Assessment

Lead author / Session organizer

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NPS Social Science Program: economic support for NPS parks, regions, and national programs

What will I get out of this?

Attendees will gain an understanding of the spectrum of Social Science Program economic resources, tools, and assistance available to NPS personnel.

**Abstract** 

Historically, NPS economic analyses have concentrated on requirements associated with environmental compliance, damage assessments, and regulatory rulemakings. Today, the economic capability of the Social Science Program (SSP) has expanded to include a broader array of how economics can contribute to various activities and issues across the NPS. The successful release of the new Visitor Spending Effects collaboratively developed with the USGS highlights a robust framework available to assist with a variety of NPS economic information needs. This expansion has also increased the SSP availability for assisting with park, regional, and national program needs through a myriad of in-house, cooperative, and consulted activities. This presentation will provide an overview of the full spectrum of SSP economic products, tools, and capabilities available to NPS personnel. Attendees will gain a better understanding of the internal capacity including the incorporation of tools developed by the USGS for expanding and strengthening NPS economic analyses.

Keywords

economics, tools, assistance

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### Wilderness and the World Heritage Convention

What will I get out of this?

The World Heritage Convention should adopt a wilderness approach to its work and should consider developing a new "World Heritage Wilderness Complex" designation.

**Abstract** 

The World Heritage Convention should consider a wilderness approach to its work to: (1) ensure the World Heritage List includes full coverage of Earth's wilderness areas with outstanding universal value; and (2) more effectively protect the ecological integrity of existing World Heritage sites, particularly in a changing climate. A wilderness approach involves adding new sites to the World Heritage List, as well as improving the integrity of existing sites by expanding or buffering them, and by promoting connectivity, between World Heritage sites, between World Heritage sites and other protected areas, or both. We review existing mechanisms under the Convention that can improve ecological integrity and further suggest the Convention should consider a new designation called a "World Heritage Wilderness Complex" to facilitate a wilderness approach. Finally, we map three landscapes and one seascape to illustrate how World Heritage Wilderness Complexes might be implemented.

Keywords

World Heritage, wilderness

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### 125th Anniversary of Yosemite and Sequoia National Parks

What will I get out of this?

Participants will learn about 125 years of shared history and conservation in Yosemite and Sequoia, which were both established in 1890.

**Abstract** 

Sequoia National Park was established on September 25, 1890 and Yosemite National Park was established on October 1, 1890. In 2015, both parks will celebrate their 125th anniversary. The exhibit will highlight the shared history of preservation of the parks in the Sierra Nevada. For example, John Muir was instrumental in gaining support in Congress for the establishment of both parks. In addition to the 125th, we will also highlight both parks' efforts in helping create the National Park Service in 1916, as we move towards the NPS centennial in 2016. Yosemite and Sequoia were fundamental in showcasing the need for a National Park Service during the Mather Mountain Party. Yosemite and Sequoia would be honored to have a shared exhibit at the GWS 2015 meeting to highlight these important anniversaries for the conference participants.

Keywords

anniversary, centennial, Yosemite

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Developing a Science-based Framework for Management and Monitoring of Pack Stock Use in Yosemite Wilderness

What will I get out of this?

Stock use in the Sierra Nevada is important, complex, and litigious. This paper blends technical information, applied management, and science communication into a transparent package.

**Abstract** 

To evaluate potential impacts of pack stock use upon Yosemite's Wilderness resources and minimize impacts to the desired range of conditions for meadows and adjacent forests, the goal of this program is: develop a comprehensive, science-based, long-term management and monitoring framework guiding stock use overlap with Wilderness resources. The framework centralizes guidance and communicates scientific information to all overnight users of Yosemite Wilderness. Assessment of meadow condition and vulnerability-to-disturbance, evaluations of specific resource concerns, and climate-change vulnerability, inform determinations of site suitability. At sites determined suitable-for-use, specialists recommend use prescriptions—best management practices, opening dates, and grazing capacity—to protect ecological integrity and guide use. As use occurs, reporting prioritizes investigations to higher-use sites and those with resource concerns. Monitoring indicators are used to evaluate effectiveness of prescriptions and facilitate adaptive management responses to changing trends over time. This pilot application is designed for incorporation into Yosemite's Wilderness Stewardship Plan.

Keywords

packstock, meadows, grazing

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**7910**Poster

Maritime History: Resources for understanding human relationships with the environment

What will I get out of this?

Our collection contains underutilized primary sources for the study of environmental history and climate change. Our poster will inform attendees about resources at the park.

**Abstract** 

The San Francisco Maritime National Park's Maritime Research Center is a rich resource for the study of maritime history. The poster draws attention to the primary resources held at the Center, and suggests possible avenues of inquiry and research. Our collection of historic ships' logbooks are a rich and underutilized source of data about daily weather conditions at sea, cargo, and natural phenomenon. Weather measurements and observations can be used to reconstruct historic weather patterns and extremes. Cargo manifests provide information about the extraction and transport of raw materials over time, for example, the volume of lumber transported from California's redwood coast. Whaling, cod, and salmon fishery vessels provide data about the volume and quality of marine species. This poster explicitly seeks to engender curiosity and to facilitate connections between scholars, researchers, and citizens to the resources available at the San Francisco Maritime National Historical Park's Maritime Research Center.

Keywords

logbooks, archives, ecohistory

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## Quantification of microplastics in southeastern coastal and marine parks

What will I get out of this?

This project presents the risk of microplastics to the marine environment, new techniques for detecting these plastics and new analyses to explain sources and distribution.

**Abstract** 

The annual global demand for plastics is estimated at approximately 245 million tons. A particular concern is the occurrence of smaller pieces of plastic debris referred to as microplastics. Ingestion of microplastics by microbiota, presents a very real problem. The concern is their potential for delivery of concentrated persistent organic pollutants (POPs), mainly those picked up from sea water. These dissolved POPs, along with the plastics themselves, are toxic. We are quantifying the amount of microplastics in beach habitat across multiple marine park units; sites range from remote to highly-urbanized and represents one of the broadest geographic sampling efforts to date. This study provides much-needed data to identify management actions to address microplastic input, protect species susceptible to effects of microplastics (e.g. shorebirds), and develop education materials. Results demonstrate the quantities found in NPS shoreline sediments and explain distribution and abundance based on ocean currents, land use, and geography.

Keywords

microplastics, marine, risk

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**7770**Poster

Tree growth response to current forest management practices and drought in Redwood National Park

What will I get out of this?

This poster will offer preliminary results investigating tree growth response to current second-growth forest management practices and drought in Redwood National Park.

**Abstract** 

The NPS Pacific-West region expends significant resources on forest management, primarily prescribed fire and mechanical thinning. An underlying rationale for these activities is that post-treatment forest structure is expected to confer resistance and resilience to disturbance, such as severe drought. We will present early results on how tree growth varies in response to forest management, and how this relationship changes during periods of drought. Tree growth was measured and analyzed from 30 research plots, spanning 8 different thinning treatments and untreated control sites within Redwood National Park. Early research efforts suggest fairly aggressive thinning is needed to produce large growth responses in these forests.

Keywords

Forests, drought, thinning

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**7591**Poster

IUCN 2016 - Hawaii - Nature + Aloha

What will I get out of this?

Introduce themes key to the IUCN 2016 meeting, international engagement and re-engagement following the World Parks Congress in Sydney in 2014.

**Abstract** 

Provide additional information to supplement GWS 2015 sessions following up on the World Parks Congress in Sydney, Australia and the look forward to the 2016 IUCN Congress sponsored by the United States to be held in the state of Hawaii. Themes will include biocultural conservation, sustainability, energy, invasive species, youth and diversity, climate change and relevancy.

Keywords

IUCN 2016, biocultural

Lead author / Session organizer

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Additional authors / organizers

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Competing Demands: Managing Cultural, Natural, Recreation and Historic Resources in Fort Ward Park

What will I get out of this?

Learn how one urban municipal park successfully embraced competing cultural and natural resource uses and recreational use demands into an adopted Park Management Plan.

**Abstract** 

For years, Fort Ward Park maintenance activities were on hold because of the undocumented location of known African American burials. The Alexandria, VA site was originally acquired to preserve and reconstruct a portion of a Defenses of Washington Civil War Circle Fort in celebration of the Civil War Centennial. Recent public awareness of the "The Fort" community, an African American community, resulted in archaeological explorations and identification of burial sites and building foundations. Also home to more traditional park activities such as picnic areas and walking paths, the park provides one of the largest forested areas in the city. How can a cash-strapped agency successfully manage a park when the use for and interpretation of every square foot is in contention? The planning process was fractious, raw and honest and led to the adoption of a Park Management Plan that addresses cultural and natural resource issues, interpretation and recreation activities.

Keywords

management, burials, forested

Lead author / Session organizer

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Francine Bromberg, MA, RPA, City Archaeologist, City of Alexandria, VA, Alexandria Archaeology Museum

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# Community-based Conservation as a Source of Conflict around a Protected Area in Sierra Leone, Africa

What will I get out of this?

Attendees will learn about the advantages and disadvantages of community-based conservation efforts and potential sources of conflict that create challenges for protected area management.

**Abstract** 

Community-based conservation efforts areas are designed to foster local stewardship of important ecological resources. In many cases, however, unequal distribution of benefits in communities surrounding protected areas can impact livelihoods, increase wealth disparities, and generate conflict. To examine the potential for conflict between host communities involved in community-based conservation program and neighboring (non-host) communities, this study explored local residents' attitudes towards conservation at Tiwai Island Wildlife Sanctuary (TIWS) in Sierra Leone. Intercept surveys (n = 368) were conducted in 18 villages (8 host, 10 non-host) within 8 km of TIWS during 2010. Results revealed significance differences between residents of the villages with respect to attitudes towards resource use at TIWS, perceived benefits associated with TIWS, and overall support for site protection. To minimize conflict and foster broader community support for conservation, managers must carefully consider how benefits associated with protected areas are communicated and distributed across park-proximate landscapes.

Keywords

Community-based conservation; Conflict

Lead author / Session organizer

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April Conway - U.S. Peace Corps

Sonia Hernandez - University of Georgia

John Carroll - University of Nebraska-Lincoln

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## Contributions of Urban Parks and Green Space to Human Well-being

What will I get out of this?

Attendees will learn about the theoretical and empirical links between parks and human well-being in urban areas of the United States.

**Abstract** 

Rapid growth of cities highlights a need to understand the contributions of parks and green space to urban sustainability. Using human health and well-being as a comprehensive indicator of sustainability, we reviewed existing literature to explore links between urban parks and green space, the ecosystem services (e.g., provisioning, regulating, supporting, cultural) they provide, and multiple aspects of well-being (e.g., physical health, emotional health, social cohesion, cognitive development, spiritual fulfillment, life evaluation). This synthesis highlighted critical contributions of parks to happy, healthy urban systems and revealed a number of persistent challenges including insufficient funding, inadequate socio-political support, and distributional inequity. In the second phase of the study, we will use the Gallup-Healthways Well-being Index and park data from other sources (e.g., Trust for Public Land) to empirically examine associations between urban green space and well-being. Results will reveal how parks can be managed to enhance the overall well-being of urban residents.

Keywords

Health; Urban; Well-being

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Viniece Jennings - USDA Forest Service

**7662** Invited Speakers

#### Sustainable Transportation in the National Parks

What will I get out of this?

Attendees will be challenged to consider potential limitations of "conventional" transportation planning in national parks and the feasibility of new approaches being developed and applied.

**Abstract** 

In most cases, transportation planning in national parks might most appropriately be termed "demand-driven". In this approach, rigorous analyses of park visitation, traffic, and parking data are used as a basis for transportation planning to accommodate current and projected future visitor demand, within financial constraints. Performance measures used to assess the quality of transportation systems in national parks are generally related to "moving people" efficiently. This approach is based on well-established principles for transportation planning in urban and rural communities. However, a demand-driven approach to transportation planning may not be suitable in national parks because it may enable levels of visitation that cause visitor crowding, resource impacts, and other unintended consequences. The purpose of this session is to present alternative approaches that challenge the conventional demand-driven approach to transportation planning in national parks.

Keywords

Transportation

Lead author / Session organizer Steve Lawson Director, Public Lands

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Additional authors / organizers

Sustainable Transportation in the National Parks, Part I: Emerging Innovations on Best Practices

Steve Lawson, Director, RSG

Transportation-related Indicators and Standards of Quality

Peter Pettengill, Outdoor Recreation Planner, Grand Canyon National Park

Modeling Relationships among Transportation, Visitor Use, and Management

Jeff Hallo, Associate Professor, Clemson University

Understanding Relationships Between Park Transportation and Ecological Conditions: A Synthesis of Recent Work

Chris Monz, Associate Professor, Utah State University

Understanding Relationships Between Transportation-relate Noise and Visitors' Experiences in Parks and Protected Areas Peter Newman, Professor, Penn State University

Tabletop — electricity  SESRC "Experts in Quality Survey & Evaluation Research" are here to assist attendees with evaluation		
SESRC "Experts in Quality Survey & Evaluation Research" are here to assist attendees with evaluation requirements and designing and securing future research projects.  The Social and Economic Sciences Research Center (SESRC) at Washington State University (WSU) opened in 1970 and is a leader in telephone, mail, web, evaluation and face-to-face survey methods. The SESRC home to Dr. Don Dillman, has contributed to the overall science in significant landmark accomplishments with the 4th edition of Internet, Phone, Mail and Mixed-Mode Surveys, The Tailored Design Method, the most cited survey methods book of all time with over ten thousand citations.    Surveys, Evaluation, Data   Lead author / Session organizer   Lead author / Session organizer   Washington State University-SESRC lena.le@wsu.edu   Lead author / Washington State University-SESRC lena.le@wsu.edu   Lead author / Session organizer   Washington State University-SESRC lena.le@wsu.edu   Lead author / Washington State University-SESRC lena.lead   Lead author / Washington State University SESRC lena.lead   Lead author / Washington State University SESRC lena.lead   Lead author / Washington State University SESRC lena.lead   Lead author / Wash		Social & Economic Sciences Research Center WAshington State University
Abstract  Abstract  The Social and Economic Sciences Research Center (SESRC) at Washington State University (WSU) opened in 1970 and is a leader in telephone, mail, web, evaluation and face-to-face survey methods. The SESRC home to Dr. Don Dillman, has contributed to the overall science in significant landmark accomplishments with the 4th edition of Internet, Phone, Mail and Mixed-Mode Surveys, The Tailored Design Method, the most cited survey methods book of all time with over ten thousand citations.  Surveys, Evaluation, Data  Lead author / Session organizer  Additional  Lead Le Director  Washington State University-SESRC lena.le@wsu.edu	Tabletop — electricity	
opened in 1970 and is a leader in telephone, mail, web, evaluation and face-to-face survey methods. The SESRC home to Dr. Don Dillman, has contributed to the overall science in significant landmark accomplishments with the 4th edition of Internet, Phone, Mail and Mixed-Mode Surveys, The Tailored Design Method, the most cited survey methods book of all time with over ten thousand citations.  Keywords  Surveys, Evaluation, Data  Lead author/ Session organizer  Washington State University-SESRC lena.le@wsu.edu	What will I get out of this?	
Lead author / Session organizer  Additional  Lena Le Director  Washington State University-SESRC lena.le@wsu.edu	Abstract	The Social and Economic Sciences Research Center (SESRC) at Washington State University (WSU) opened in 1970 and is a leader in telephone, mail, web, evaluation and face-to-face survey methods. The SESRC home to Dr. Don Dillman, has contributed to the overall science in significant landmark accomplishments with the 4th edition of Internet, Phone, Mail and Mixed-Mode Surveys, The Tailored
Session organizer  Additional  Washington State University-SESRC lena.le@wsu.edu	Keywords	Surveys, Evaluation, Data

We Listened, We Learned, We Acted: Lesson learned from engaging diversity at George Washington National Monument

What will I get out of this?

Using focus groups to learn about barriers to park visitation faced by underrepresented populations, then applying the results to increase visitor diversity.

**Abstract** 

From August 22-30, 2013, focus groups were conducted with individuals from African American, American Indian, Asian, Hispanic/Latino, and low-income populations living within a two-hour commute of George Washington Carver National Monument in Diamond. MO. The study's objectives were to learn about: 1) preferred park attributes across demographic groups; 2) the types of barriers faced in regard to visiting parks; and 3) how to increase the diversity among park visitors. Results showed that through expanded outreach, direct engagement with community representatives, advertisement designed for and targeted to reach specific populations, enhanced institutional image, and demographic-specific services, facilities, and activities, much can be done to increase diversity. Building on the study's recommendations, managers at the Monument have launched a five-year project to put the results of research into practice by building relationships with and engaging community leaders and youth, while continuing to listen and learn from target populations.

Keywords

Diversity, engagement, outreach

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## A Multi-Pronged Approach to Engaging with Scientists and Researchers

What will I get out of this?

Audience members will learn about how Santa Monica Mountains National Recreation Area uses a multitude of non-traditional approaches to engage with the local scientific community.

**Abstract** 

Located next to the city of Los Angeles, the Santa Monica Mountain National Recreation Area, along with multiple agency partners, manages and protects one of the last remaining examples of the Mediterranean-type ecosystem. To preserve the ecological diversity of the mountains while connecting to diverse communities of people, the park has taken a multi-prong approach to engaging scientists and researchers with the park and public. Efforts range from direct relationships with scientists through the research permit process, and universities including having park staff as adjunct professors as well as official collaborations to promote research in the park. Indirect efforts include hosting Science Days, an opportunity for researchers to present their work to park and partner staff, and Science Festivals, an outreach event for the public to directly interact with scientists. These efforts help to promote the park and the research occurring within to a wide variety of audiences.

Keywords

scientists

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Christy Brigham, Santa Monica Mountains National Recreation Area

7652 Workshop

### Managing Wildlife and Human Behavior to Address Human-Wildlife Interactions

What will I get out of this?

This workshop will engage managers and practitioners in assessing and developing varying approaches to managing changes in animal and human behavior that affect human-wildlife interactions.

**Abstract** 

This workshop will engage participants in applying theory to practice in managing human-wildlife interactions. In the first hour, participants will learn about key principles and foundational aspects of animal behavior and human behavior that affect human-wildlife interactions. A case study will demonstrate how adaptive management strategies, including feedback from biological and sociological monitoring data and numerous targeted scientific studies, has been applied at Redwood National Park to affect human-wildlife interactions. In the second hour, participants will break into discussion groups around three main lifeforms of concern in parks (bears, ungulates, and meso-carnivores) to further brainstorm and refine the overarching principles and practice developing strategies to influence human behavior, using techniques such as commitments, social norms, prompts, effective messages, and convenience. Our ultimate goal is to synthesize information and recommendations to reduce risks to people and wildlife from human-wildlife interactions and improve management and consistency across the Service.

Keywords

stewardship, research, outreach

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Managing Human-Wildlife Interactions: Principles of Animal Behavior Change and Learning
Kirsten Leong

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Managing Human-Wildlife Interactions: Principles of Human Behavior Change and Learning
Sara Melena

Killer Potato Chips: Adaptive Management and Visitor Behavior Change to Conserve an Endangered Seabird Keith Bensen, Fish and Wildlife Biologist, Redwood National and State Parks

Tourism and Visitor Management in Protected Areas: Guidelines for Sustainability

What will I get out of this?

Present the newly published IUCN best practice guidelines for tourism and visitor management in protected areas

**Abstract** 

This presentation will provide an overview of the newly released IUCN best practice guidelines, entitled "Tourism and Visitor Management in Protected Areas: Guidelines for Sustainability". This edition is a major update from the Sustainable Tourism in Protected Areas: Guidelines for Planning and Management published in 2002 (Eagles, McCool and Haynes). The four authors served as editors with support from over 50 contributors in 18 countries. This Guidelines book covers major topics of tourism and visitor management in protected areas. It is illustrated by case examples from 44 countries in all continents. The presentation will also showcase a website that was developed to support this Guidelines book and facilitate global sharing of best practices on tourism and visitor management topics.

Keywords

parks, tourism, guidelines

Lead author / Session organizer

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Ralf Buckley, Griffith University, Australia

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7902 Invited Speakers

# Commercial Air Tour Planning and Current Activities under the National Parks Air Tour Management Act

What will I get out of this?

Update on implementation of the National Parks Air Tour Management Act of 2000: results of air tour reporting, assessment of aircraft noise, voluntary agreement development

**Abstract** 

The National Parks Air Tour Management Act of 2000 was enacted to address concerns that noise from air tours over national parks could affect visitor experience and park resources. This session will provide an update on the following topics regarding air tour management: 1) an overview of the 2012 amendments to the Act, 2) review of information collected from commercial air tour operators that illustrate some trends in activity system-wide, 3) development of a strategy by the NPS Pacific West Region to evaluate the impacts of commercial air tours on natural soundscapes in wilderness, and 4) development of voluntary agreements with commercial air tour operators, where agreements address management issues necessary to protect park resources and visitor use without compromising aviation safety. NPS and Federal Aviation Administration staff will discuss voluntary agreements under development and lessons learned thus far.

Keywords

overflights, wilderness, soundscapes

Lead author / Session organizer **Brent Lignell** Overflights Planner

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Overview of amendments to the National Parks Air Tour Management Act of 2000

Vicki Ward, Overflights Program Manager, NPS

Results of 2013 Commercial Air Tour Reporting/Trends in Air Tour Activity over National Parks
Brent Lignell, Overflights Planner, NPS

NPS Pacific West Region Wilderness Air Tour Noise Assessment Strategy

Judy Rocchio, Pacific West Region Soundscape Coordinator, NPS

Developing a Commercial Air Tour Voluntary Agreement - Lessons Learned by NPS and FAA

Keith Lusk, Special Programs Manager, Federal Aviation Administration

Improving Gateways to Cape Lookout National Seashore: A New Passenger Ferry System

What will I get out of this?

A common theme across many parks is the desire to establish and/or improve alternative transportation systems. This paper summarizes the keys to success.

Abstract

Prior to 2014, access to the southern portions of Cape Lookout National Seashore was limited to a series of privately operated ferries. In conjunction with instituting a long-term contract, the NPS needed to establish a recognizable gateway from the local community to the national seashore. In 2009, Otak and VHB were contracted to conduct a feasibility study and an environmental assessment for the revised ferry service and a new departure site from North Carolina's Crystal Coast. Following extensive evaluation of the potential departure sites and a number of stakeholder meetings, the team agreed upon the "Post Office" site on Beaufort's Front Street. Coordination between the NPS, the Town of Beaufort, and the North Carolina State Historic Preservation Officer resulted in successful renovation of the historic Beaufort Post Office, and the newly contracted ferry service began operations out of this new gateway early in 2014.

Keywords

ATS, ferry, feasibility

Lead author / Session organizer

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**8307**Poster

#### Connecting people to parks with iNaturalist

What will I get out of this?

iNaturalist is a citizen-science technology platform that builds communities of stewards around parks providing new ways to engage the public and collect valuable monitoring data.

**Abstract** 

Protected areas are one of the most effective lines of defense against species extinction. However, if the public is not aware of or does not value this link between their local protected areas and the plants and animals it harbors, they will be strong advocates for their parks. Likewise, protected area managers need new streams of monitoring data to properly manage the species within parks amid continued land use and climate change. iNaturalist is a citizen science technology platform that builds communities of stewards around protected areas to provide new ways to engage the public and collect valuable monitoring data at the same time.

Keywords

technology, engagement, citizen-science

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**7947**Poster

# Using film to communicate natural resource issues at Cabrillo National Monument

What will I get out of this?

Through a series of short films, the audience will observe how Cabrillo NM partners with other agencies and institutions to resolve complex natural resource issues.

**Abstract** 

In 2014, Cabrillo National Monument embarked on a project that documented how the park approached complex resource management issues in partnership with local institutions and federal agencies. The result was a series of short films that are intended to serve as an educational tool that informs the public about the National Park Service mission, multifaceted issues that can arise in a small urban park and partnerships in action. In these short films (each less than 5 minutes), we explore management options for Cabrillo NM based peregrine falcons who may be preying upon the endangered least tern, the mysterious arrival of leopard sharks in our rocky intertidal, and the tenuous relationship between a threatened species of agave and its pollinator, the long-tongued Mexican bat.

Keywords

science, resources, outreach

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### Finding Common Ground: A Pathway to Community Stewardship

What will I get out of this?

Gain ideas for stewardship beyond park boundaries and developing working relationships among landowners, organizations and local agencies to create win-win solutions.

Abstract

The long-term viability of key endangered species that Pinnacles National Park (PINN) works to protect depends upon a robust ecosystem beyond our 27,000 acres. California condors, California tiger salamanders, California red-legged frogs are all supported by surrounding working ranches. However, with the economic downturn and other challenges, this open space and the habitat connectivity it maintains is at risk of being lost forever. To address these concerns, PINN and partners, initiated a partnership of local agencies, organizations and landowners to seek common ground among once unlikely collaborators – to maintain the large tracts of rangelands that provide a livelihood and cultural tradition as well as viable habitat. Since 2011, the San Benito Working Landscapes Group has gained traction in the community with accomplishments that include facilitation of a multi-million dollar conservation easement on private lands adjacent to the Pinnacles and connecting landowners with federal grant programs and technical assistance.

Keywords

rangelands, community, partnership

Lead author / Session organizer

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Lisa Smith, San Benito Working Landscapes Group Community Connector

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National Park Service Pacific West Region (PWR) Cultural and Natural Resource Gathering 9022 **Update** What will I get out of this? Join PWR natural and cultural resource professional for an opportunity to meet one another and share: **Abstract** opportunity to talk shop/career development/get advice from peers; opportunity to hear how other people are dealing with issues that we all are struggling with; and opportunity to support each other and be inspired by how amazing our colleagues are and what cool work we get to do. Session will be both informal and have some structured small group discussions along with a chance to hear from Regional Deputy Director and natural and cultural resource chiefs. **PWR** Keywords **Denise** Louie Chief of Resources Management Lead author / Session organizer Pinnacles National Park denise.louie@nps.gov Additional Christy Brigham, Abby Sue Miller and Brent Johnson authors / organizers

#### The Future of Science in the National Parks

What will I get out of this?

This presentation will—in a hopefully provocative and accessible way—suggest what the future of science in national parks may be in the decades ahead.

**Abstract** 

The early decades of the 21st century promise significant advances in the directions, disciplines, and delivery of science for protected areas, especially national parks. Strategic needs of resource management agencies will continue to converge, and on-the-ground projects will challenge contemporary assumptions of basic and applied science. Beyond the obvious advances in climate change science, new and emerging disciplines—from forensic genomics to ethnoecology—will contribute new tools, new understanding, and new questions for both scientists and managers. The integration of advanced monitoring (downstreamed from declassified national security technology), big data, 4th generation social media, the expansion of specialized science courts, and the institutionalization of citizen science will alter who does sciences and how it is delivered. As the NPS enters its Centennial, this presentation will—in a hopefully provocative and accessible way—suggest what the future of science in national parks may be in the decades ahead.

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science, national parks

Lead author / Session organizer **Gary E.** Machlis Science Advisor to the Director

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### **Protected Areas the future?**

What will I get out of this?

The audience will learn about the challenges facing protected areas and the what protected areas will be in the future

**Abstract** 

A Global driver of protected area expansion in Target 11 of the Aichi Biodiversity Targets. This target has quantitative, 17% coverage on land, 10% coverage in the Marine as well as detailed qualitative aspects such as protected areas being effectively and equitably managed, well connected and representative. The current coverage figures are 15.4% on land and 3.41% of the global ocean, however these figures do not tell the complete story. In order to achieve all aspects of this target we need to expand the concept of a protected area network to included gazetted sites as well as privately protected areas and community area. There needs to be a focus on the creation of additional protected areas in the marine environment. This presentation will be based on the global Protected Planet 2014 report.

Keywords

**Protected Areas, Coverage** 

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# Stories Are Resources, Too: Embracing Broader Narratives to Build Parks' Future Personal and Public Relevance

What will I get out of this?

Story is the single source of relevance the NPS controls. Attendees discover why this is so and options for diversifying the system's storytelling capacity.

**Abstract** 

Story creates both a sense of experience and the experience of sense. It creates memorable moments, expectations, and engagement. Yet storytelling successes at the local level, in parks, aren't in isolation sufficient to sustain people's commitments to stewardship. To survive and thrive, parks and systems must compete in the national and global marketplaces of identities and ideas. How? By creating personal and public relevance that wins people's hearts and minds, their promotional support. To earn that backing, the NPS needs to expand and diversify its storytelling powers. Three means to strengthen and broaden these support-producing capacities for parks and protected areas include cultivating cross-training opportunities in subject-matter disciplines and the arts, developing metanarratives that unite sites into cohesive stories, and telling tales in different ways for different audiences. In these ways, through stories, its only source of power the NPS controls, the public can experience parks' increased inclusivity and relevance.

Keywords	words Story, power, relevance					
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Session organizer	National Park Service, Fort Union Trading Post NHS fred_macvaugh@nps.gov					
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7727 Invited Speakers

## From Theory to Practice: Social Policy and the Park Service, 1950-1980

What will I get out of this?

This session examines how shifting public policy priorities shape the creation and management of protected areas, with an emphasis on environmental, social and economic factors.

**Abstract** 

Drawing on a historical perspective, this compass session highlights the interplay of social policy and protected area management in the decades following World War II. As the United States experienced rapid cultural and economic change, parks and other public lands frequently emerged as sites of experimentation and contestation, with managers and diverse stakeholders questioning longstanding norms and practices. Key discussion points include: What role did managers, advocates, critics and others play in the designation of new national park units and in the re-interpretation of older sites? How did this process of conflict and negotiation shape the physical, narrative, and interpretive legacy of parks? Can protected area histories reveal shifts in American culture and social organization? Finally, what lessons can park histories impart for current and future NPS management practices, especially as it applies to the successful crafting and later implementation of policy over time?

Keywords

policy, history, NPS

Lead author / Session organizer **Eleanor Mahoney** PhD Candidate

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Creating a Native Hawaiian National Park: The Movement to Establish Kaloko-Honokōhau National Historical Park

Chris Johnson, Historian, Pacific West Region, National Park Service

The Recreation Imperative: Urban Parks in the Age of Environmentalism

Eleanor Mahoney, PhD Candidate, University of Washington

The Job Corps Program: Waging a War on Poverty in the National Parks, 1964-1969

Angela Sirna, PhD Candidate, Middle Tennessee State University

Valuing Vision: Frances Payne Bolton and the Preservation of George Washington's "Overview"

John H. Sprinkle, Jr., PhD, Bureau Historian, Park History Program, Washington Office, National Park Service

**Moderator / Chair** 

David Louter, PhD, Chief, Cultural Resources Program, Pacific West Region, National Park Service

Conventional and alternative approaches to low-impact education: closing the distance between managers and visitors

What will I get out of this?

Research highlights critical considerations for managers and presents alternative approaches. Management efficacy and acceptability can be improved by incorporating presented results.

**Abstract** 

Educational campaigns to minimize the impacts of recreation are preferred by both park managers and visitors. Exemplified by the Leave No Trace campaign, these efforts seek mitigate recreational impacts by changing visitor behavior. For education to be effective and supported by visitors, visitors must recognize the impacts of recreation, evaluate them negatively, and perceive improved conditions from management action. However, park visitors often do not recognize the impacts of recreation and, in some cases, may evaluate them positively. This research explores the effectiveness of conventional and alternative low-impact educational messages using a field experiment in Acadia National Park. The experimental applications and the survey instruments used to evaluate their effectiveness explore visitors' recognition and evaluation of recreational impacts and the roles that these cognitive process play in management effectiveness. Lessons drawn from this research can refocus low-impact educational messages to better resonate with visitors, improving campaign efficacy and acceptability.

Keywords

LNT, Recreation, Education

Lead author / Session organizer

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Chris Monz, Utah State Universtiy

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**8032**Poster

Analysis of 15-year bat study in Chiricahua National Monument and Fort Bowie National Historic Site

What will I get out of this?

Our survey methods are simple, but the study length is unique and represents an opportunity to view changes in bat species over time.

**Abstract** 

Chiricahua National Monument has collaborated with Karen Krebbs over the last 15 years to monitor bat populations at Chiricahua National Monument and Fort Bowie National Historic Site. This long-term monitoring effort began as summer only surveys and expanded to year-round surveys in 2011. Each year the surveys seek to identify species present in the park and to capture basic health and trends in bat populations. Continuing this project will contribute to WNS and Climate change monitoring as well as determining post-fire impacts on bat populations in the ecologically diverse Chiricahua mountains. The parks are currently collaborating with University of Arizona and to analyze trends over time and compare to similar regional surveys on both sides of the international border.

Keywords

**Bat Monitorig** 

Lead author / Session organizer

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Additional authors / organizers

Karen Krebbs is the principle investigator for the 15 year study, but will not be present. Jason Mateljak has been assisting with the project the last three years and will be present for the poster session.

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8040 Poster

## Restoration of Apache Spring Watershed in Fort Bowie National Historic Site

What will I get out of this?

Lessons learned from project to preserve a naturally and culturally significant water source and its watershed within a cultural landscape

**Abstract** 

Waterflow at historic Apache Springs has been steadily declining over the 10 years. This is the potential result of a variety of factors contributing to soil loss and changes in infiltration. Fort Bowie National Historic Site has been engaged in restoration of Apache Spring watershed since 2010 and grassland restoration within the watershed since the 1980s. In 2010, the park contracted the development of a soil loss and erosion potential map of the watershed. Based on the results of this map, the park began a series of restoration efforts to mitigate soil loss and increase infiltration. A difficulty with this process is the presence of cultural landscape, which alters the methods that can be employed during restoration efforts. Project results highlight the park's attempts to mitigate this issue and describes the long-term effort to restore the spring.

Keywords

Spring, Watershed, Restoration

Lead author / Session organizer

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Additional authors / organizers

Additional authors/collaborators include Maura Thoenes, Laura Fawcett, Colleen Fillippone, Adam Springer, Larry Ludwig, and Ryan Janway.

8036

Wildlife Camera Trap Census of Small-Medium Mammals in Fort Bowie National Historic Site

What will I get out of this?

Results of two sampling methods for monitoring small to medium mammals as well as general species census for the park.

**Abstract** 

During 2013, Fort Bowie National Historic Site conducted two simultaneous wildlife camera trap surveys for small to medium sized mammals in collaboration with Saguaro National Park and the Sonoran Desert Inventory and Monitoring Network. Forty-four cameras were deployed within the 999-acre park over a seven-week period. Images of wildlife were captured at 11 different locations with five locations chosen by biologists and six locations randomly chosen. The goal of this project was to establish a current baseline of mammal species present in the park and to conduct a pilot study to compare different survey protocols. In total, 344,245 pictures were taken, 13,203 pictures of wildlife were captured, and 16 mammal species were identified.

Keywords

Mammal, Camera Trap

Lead author / Session organizer

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Additional authors / organizers

There are several collaborators on this project and it is associated with another paper presentation focusing on comparison of the methods employed in this survey and development of a regional wildlife camera protocol. Additional collaborators include Don Swann, Nic Perkins, Lacrecia Johnson, Amanda Selnick, Thomas Athens, Maura Thoenes, Adam Springer, Ryan Janway, and Laura Fawcett. Several other staff members contributed greatly to the project and will be included in acknowledgements.

**8084**Poster

Fish-WIKS: Understanding how Western and Indigenous Knowledge Systems can improve the sustainability of Canadian fisheries.

What will I get out of this?

Audience members will obtain insight into fisheries governance in Canada from western and indigenous knowledge systems to influence fisheries-related decision making processes.

**Abstract** 

Fisheries decision-making processes in Canada are influenced primarily by western science-based knowledge systems and often exclude knowledge from non-western based indigenous sources. As Canada faces growing challenges from climate induced changes in coastal and inland areas, it is increasingly important for Canada to consider diversified knowledge sources to meet its stated goal to promote "sustainable aquatic ecosystems" and to accommodate its legal obligation to recognize Aboriginal and treaty rights and title. In contrast to the current federal regime, Indigenous Knowledge Systems (IKSs) are often based on a world view and values that are place based and communally owned, rooted in a shared history, holistic, experiential and transmitted in oral language that is dependent on distinct cultural contexts. Fish-WIKS research looks at understanding western and Indigenous knowledge systems and explores how the different processes by which knowledge is acquired, transmitted and used can be harnessed to enhance Canadian fisheries policy.

Keywords

Indigenous, knowledge, fisheries

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7798
Sharing Circle

# Resources Science and Stewardship in a Time of Uncertainty – How are we doing?

What will I get out of this?

Sharing stories about resource and science stewardship that push the envelope would intrigue and give us all courage to face these uncertainties of change ahead.

Abstract

I would like to have a conversation with other professionals that allows us to speak candidly about the future of our respective parks. We seem to be at a turning point with the Revisiting Leopold report to really question the resources management actions we have perfected over the decades. Are we making a difference or still trying to maintain a snapshot in time for the visitor. Have we truly improved the ecological integrity of our parks when outside threats continue to shift what our desired conditions should be? Separate pathways between science and applied resources management instead of an integration of minds working together towards one outcome still exist and I wonder if there is ever a way to truly align park needs with scientific interests. I offer many questions this sharing circle could tackle. I'm open to suggestion and hope this concept will somehow be delivered at the conference.

Ke		

uncertainty, integrity, innovations

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Lead author / Session organizer **Linda Mazzu** Chief, Resources Management and Science, Yosemite National Park

Additional authors / organizers

## Yosemite Valley – Experiencing a naturally cultural landscape

What will I get out of this?

This presentation will provoke thought on past and future of Yosemite stewardship and provides with an overview of state of the art ecological restoration.

**Abstract** 

Yosemite Valley is a landscape culturally manipulated for thousands of years. When the federal government set aside Yosemite Valley in 1864 as a place of 'public use, resort and recreation... inalienable for all time', it changed the trajectory of the Valley forever. Most visitors do not understand the cultural evolution behind this seemingly natural place; that their perception of the scenery and experience of place is one that is designed. Today, the NPS must to steer the trajectory of Yosemite Valley to navigate visitor congestion, climate change, modified hydrologic function, and an anthropogenic fire regime. The NPS has begun implementation of a Valley-wide restoration plan that strives to capture both natural and historic fidelity. How far beyond natural should the NPS go to protect a snapshot in time? This paper will provide a history of Yosemite Valley and lay out its current condition, restoration success, future challenges, and steps ahead.

Keywords

ecological, cultural, landscape

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Garrett Dickman, Yosemite National Park

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# Conservation Gain: Measuring natural resource performance in Canada's National Parks

What will I get out of this?

Value for money? Our investments in restoration and conservation often come under the microscope. This a system-wide assessment involving projects and vital signs.

**Abstract** 

Parks Canada has committed to improve at least one ecosystem indicator in each of 20 National Parks. A clear picture of the state of all the National Parks was required to highlight the indicators that required priority active management intervention. Parks Canada tracks a selection of eight national ecosystem indicators across its 44 national parks for a total of 123 indicators. Where predetermined conservation targets are met in these ecosystems and overall condition is stable, we demonstrate a net improvement in ecological integrity. In our first attempt to show system-wide conservation gains, we focussed heavily on reliable approaches such as increasing aquatic connectivity and restoring the natural fire cycle on the landscape . We also discuss our future plans for developing dashboards to report conservation performance in national parks for key decision makers.

Keywords

Monitoring, reporting, restoration

Lead author / Session organizer

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7985 Workshop

# Working Together to Enhance Communciation about the Importance of Clean Air and Scenery

What will I get out of this?

Help the NPS-Air Resources Division improve how it communicates with park resources managers, partners and the public via the development of a comprehensive communication plan.

**Abstract** 

The science and regulatory world associated with advancing clean air in parks is complicated and steeped in technical and legal terminology. In our efforts to be precise we too often use language that is hard to understand, defeating our desire to communicate and engage park resource managers, partners and the public. Aware of the language challenges in the air arena and the need for outreach, we have developed a draft communications plan. The plan covers both communication about clean air and the importance of protecting scenic views that extend beyond park boundaries. We need and welcome your help, especially on effective ways for connecting with park resource managers, partners and the public.

Keywords

communication, air, scenery

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8082 Poster How will climate change influence winter tourism along Minnesota's North Shore?

What will I get out of this?

Nature-based tourists' behavioral responses to climate-related changes within a recreational system provide insights that can enhance tourism-dependent communities' climate readiness.

**Abstract** 

Communities along the North Shore of Lake Superior are dependent upon nature-based tourism; however, recent data suggests tourism is declining within the region. Climate change may partially contribute to this trend. As weather conditions become less predictable and more variable, tourists are likely to modify habitual recreation behaviors. A multi-disciplinary research project is currently underway to assess North Shore communities' adaptive capacity, objectively determine climate-related risks to tourism within the region and deliver science-based decision support tools. This poster presents results from an on-site survey assessing winter tourists' past visitation patterns, their climate-related risk perceptions specific to the North Shore and their willingness to substitute alternative recreational activities for those impacted by increasingly variable climatic conditions. The results offer tourism providers a better understanding of how climatic change is likely to affect tourists' visitation behavior.

Keywords

climate, tourism, survey

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**Lionfish Invasion: Hold on to Your Habitat** 

What will I get out of this?

Learn of emerging threat to parks and marine protected areas. Apply scientific knowledge, communications, policy and adaptive management to aquatic nuisance species at local level.

**Abstract** 

Aquatic invasive species outcompete native species and degrade their habitats, while causing billions in economic losses every year. The invasive Indo-Pacific Red lionfish (Pterois volitans) is a voracious marine predator that consumes tremendous amounts of native fish and invertebrates. Lionfish also pose threats of injury and illness from stings caused by their venomous spines. Biscayne National Park established a lionfish monitoring and removal program in 2009. However, little was known of lionfish biology and control prior to the recent invasion of several parks, only that their rapid reproduction and range make control of lionfish extremely challenging. In 2012, NPS adopted a service-wide Lionfish Response Plan, based on a multi-disciplinary workshop with park managers, biologists, interpreters and safety experts, as well as NGOs and universities. This presentation will share experiences from several parks and recent knowledge gained in solving the vexing problems posed by this aquatic invader.

Keywords

invasives, coral, oceans

Lead author / Session organizer

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C. Anna Toline, NPS Southeast Regin

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A synthesis of two decades of research documenting the effects of noise on wildlife

What will I get out of this?

Learn about the extensive volume of existing information concerning the effects of anthropogenic noise on wildlife. The results provide important guidance for evaluating noise impacts.

**Abstract** 

Global increases in environmental noise levels - arising from expanding human populations, transportation networks, and resource extraction - have led to a pulse of research into the effects of noise on wildlife. We conducted a systematic and standardized review of scientific literature published from 1990 -2013, including both terrestrial and aquatic studies. The goals were to evaluate key areas of knowledge, identify emerging themes, and synthesize information on biological responses to noise levels. The majority of studies documented effects from noise, including altered vocal behavior, reduced abundance in noisy habitats, changes in vigilance and foraging behavior, and impacts on individual fitness and community structure. We identify areas for further research and best practices to standardize reporting of acoustic metrics. The broad volume of existing information concerning the effects of noise on wildlife offers a valuable resource to assist scientists, industry, and natural resource managers in predicting potential outcomes of noise exposure.

Keywords

noise, wildlife, acoustics

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Katy A. Warner, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, Colorado, United States of America

Misty D. Nelson, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, Colorado,

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## Using Bioacoustics to Study Song Bird Phenology in Glacier Bay National Park

What will I get out of this?

The audience will learn about a technique to monitor changes in song bird activity using acoustic recordings and acoustic indices.

**Abstract** 

Populations of birds migrate to northern latitudes for summer breeding season. The timing of these events are known to be indicative of environmental conditions and monitoring these events may provide insight to changes in ecological conditions related to climate. We collected continuous acoustic data from March through June of 2012-2014 at a single site in Glacier Bay National Park to monitor birdsong. We applied the acoustic complexity index and built species-specific detectors to understand temporal patterns in bioacoustic activity. We were particularly interested in the phenology of spring birdsong for several select species and estimating the onset of breeding season singing and the arrival of migrants. Further, changes across years were analysed. The acoustic and analytical methods developed provide a powerful tool to monitor seasonal changes in birdsong in remote areas and potentially across landscapes.

Keywords

phenology, acoustics, birdsong

Lead author / Session organizer

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# Monitoring data applied to mitigating a corallivore outbreak in the National Park of American Samoa

What will I get out of this?

The usefulness of monitoring data are often questioned. The audience will learn of a case where such data sets are critical for effective management action.

**Abstract** 

Robust monitoring data are critical for effective management. Here, we report how marine benthic monitoring data from the Pacific Island Network (PACN) and National Park of American Samoa (NPSA) can aid in mitigating threat from a coral eating sea star (Acanthaster planci) outbreak on coral reefs within the Tutuila unit of NPSA. High populations of these sea stars can spread quickly, decimating reef habitats. Culling of these sea stars is being implemented to combat outbreaks, but culling site prioritization for widespread outbreaks can be challenging. PACN and NPSA benthic monitoring data were collected over six years from 15 permanent and 90 temporary reef sites (4.5m2 per site) within Tutuila. Using these data, georeferenced reef maps were generated to indicate coral species richness by sites and year. This helped identify and prioritize reef sites with the highest coral richness for culling. These data will also be valuable for impact and recovery.

Keywords

reefs, monitoring, mitigation

Lead author / Session organizer

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Kelly Kozar, Pacific Island I&M Network, Hawaii National Park, HI 96718

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8049 Poster

## **Engaging Young Scientists in Park Management**

What will I get out of this?

We can engage a new generation of scientists in

Abstract

The Continental Divide Research Learning Center at Rocky Mountain National Park uses a combination of techniques to engage young scientists in park management. These techniques include the following: Identifying key park issues needing research information, providing "mini-grants" through cooperative education study unit task agreements to provide seed money for high priority research, working with university research partners to co-create research project suitable for graduate student projects and undergraduate student involvement, participating in active mentoring of engaged young scientists, and disseminating research results to park managers and the general public through a variety of media including science conferences, brown bags, web products, summary papers, podcasts and briefings to park interpretive staff. Through this active engagement we can cultivate young scientist partners to help preserve and protect our national treasures.

Keywords

science, youth, management

Lead author / Session organizer

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Additional authors / organizers

Dr. Isabel Ashton, National Park Service, Rocky Mountain National Park


8109 Challenge

# **Better Protection for Sacred Places**

What will I get out of this?

Conflict between protected area managers and indigenous peoples can only be resolved with dialogue. This session furthers dialogue and nurtures partnerships that protect sacred places.

**Abstract** 

Sacred places are the oldest protected areas on the planet, yet they are in peril within government protected areas and beyond. How can we better protect sacred places? We'll screen the film "Standing in a Sacred Ground: Pilgrims and Tourists" - on Russia's Altai Republic and Mt. Shasta in California, and discuss urgent current issues with filmmaker Christopher McLeod and Winnemem Wintu Chief Caleen Sisk.

Keywords

sacred, land, sites

Lead author / Session organizer **Christopher McLeod** Producer and Director

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Additional authors / organizers

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Christopher McLeod

Chief of the Winnemem Wintu Tribe	
Caleen Sisk	

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# **Islands of Sanctuary Film**

What will I get out of this?

Conflict between protected area managers and indigenous peoples can only be resolved through dialogue. This session continues dialogue and nurtures partnerships to protect sacred places.

**Abstract** 

Indigenous Protected Areas are being recognized around the world as a new model of protected area, where sacred places are controlled and managed by native people. We'll screen the film "Standing in a Sacred Ground: Islands of Sanctuary" - on Australia's Northern Territory and the Hawaiian island of Kaho'olawe, and discuss these urgent issues with filmmaker Christopher McLeod and native leaders.

Keywords

sacred, land, sites

Lead author / Session organizer **Christopher McLeod** Director and Producer

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Additional authors / organizers

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<b>7009</b> Contributed Papers	Park Planning in a Changing Social and Natural Environment
What will I get out of this?	How do you prepare parks for the future when so much if it will be so different from the past? Planners are on the front line.
Abstract	
W 1	
Keywords	
Lead author / Session organizer	Kevin McNamee
Additional authors / organizers	

7932 Workshop

## Developing a vision for social science in the National Park Service

What will I get out of this?

Social science data and knowledge is increasingly important for park managers to make thoughtful and collaborative decisions that balance resource protection and visitor experience.

**Abstract** 

The NPS is developing a strategy to update the vision for the disciplines comprising social sciences across the service called the Social Science Strategy (S3). The strategy guides the coordination of agency social science efforts for the next ten years. The S3 also aims to articulate a long-term vision for social sciences, solidify a professional network, identify related needs and opportunities, identify potential gaps in priority disciplines or programs, outline ways to leverage support, and set realistic goals and objectives that will further these sciences in the NPS to greater assist with informed decision making. Select NPS stakeholders are identified and tasked with creating a vision statement, identifying needs and opportunities, and defining goals and objectives. During this compass session, workgroup stakeholders will build from existing developments in the S3 and ask session participants to build off of existing elements to bolster and expand perspectives and communications within the strategy.

Keywords

Social science, planning

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Bret Meldrum, National Park Service

**7822**Poster

Rapid Energy Development and the Vanishing Night Sky at Theodore Roosevelt National Park

What will I get out of this?

The audience will gain an understanding of the impacts unchecked energy development can have on a lesser known resource like the night sky.

**Abstract** 

Though the first oil wells in North Dakota's Bakken Formation were drilled in the early 1950's, energy development was modest until the use of hydraulic fracturing techniques began in 2006. Since then, there has been an unprecedented boom in energy development in the region surrounding Theodore Roosevelt National Park (and its almost 30,000 acres of designated wilderness). Satellite imagery from 1996 shows a landscape mostly free of anthropogenic light. Newer imagery from 2012 reveals a distinctly different landscape, with a vast area illuminated at night. Ground based photometry by the NPS Night Skies Program in 2010, 2011, and 2013 show a 545% increase in anthropogenic light in the environment in just three years time. What was once a place where a visitor could experience a natural dark night sky, has now lost that aspect of its wilderness character from the activity associated with drilling, extraction, transportation, and gas flaring.

Keywords

Night, Skies, Fracking

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7744
Panel Discussion

### Redrawing the Boundaries: Science Communication in the NPS

What will I get out of this?

The audience will consider the role of the NPS in science communication and scientific literacy, and to reconsider the lines between resource management and interpretation.

Abstract

Since the early days of the generalist Ranger Naturalist Service, disciplinary specialization and organizational division have grown between the NPS fields of Resource Management and Interpretation. However, given today's environmental challenges, coupled with a lack of public understanding of science, NPS leaders at the highest levels have identified science communication as an important agency goal. As such, there is a paradigm shift occurring in both resource management and interpretation that requires greater integration of science into interpretation and asks scientists to become better communicators. These aligning visions challenge the NPS to consider its role in science communication and scientific literacy, and to reconsider the lines between resource management and interpretation. This session explores science communication and its meaning in the NPS's second century. The panelists will share their visions and lead a discussion about the benefits, challenges, and the role of land management agencies in science communication and science literacy.

Keywords

#### science, management, interpretation

Lead author / Session organizer

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Mike Whatley, Office of Education and Outreach Chief, National Park Service

Tim Watkins, RLC/CESU National Coordinator, National Park Service

Alice Wondrak Biel, Writer-Editor, National Park Service

The state of science literacy in society

Dr. John Falk

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The NPS Case for Convergence of Resource Management and Interpretation

Dr. Ray Sauvajot

The NPS Case for Convergence of Resource Management and Interpretation

Julia Washburn

Science Literacy and the National Park Service

Tim Watkins

Reconsidering the lines between resource management and interpretation

Mike Whatley

# Engaging Local Educators: Using Geosptatial Technology to Explore Current Park Management Themes

What will I get out of this?

Through presenting a successful model, the goal is for some audience members to be inspired and pursue similar endeavors.

**Abstract** 

Geographic Information Systems (GIS) technology has arrived in secondary school curriculums and the NPS has a great opportunity to educate and inform its local and regional public through this avenue. Whitefish (Montana) High School rolled out its first offering of Introduction to GIS in the fall 2014, Glacier National Park's Geographer was a guest teacher in Whitefish, walking students through GIS-based lessons developed by Glacier staff that explored Aquatic Invasive Species (AIS) control efforts and Bull Trout Conservation measures recently undertaken in Glacier. Students learn ArcGIS through exploring spatial data utilized by the NPS in its decision-making process. Setting youth free with engaging content and technology is a highly effective educational approach. The NPS can advance its stewardship cause through offering technology-based content in area schools while simultaneously enhancing relations with those gateway communities. The work in Glacier to develop GIS lessons was funded by the Glacier National Park Conservancy.

Keywords

gis, science education

Lead author / Session organizer

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Eric Sawtelle, Science Teacher at Whitefish (Montana) High School

## Assessing the condition of acoustical resources across the National Park Service Units

What will I get out of this?

The magnitude of noise will be assessed within NPS units across the United States using a spatially comprehensive map of existing acoustic conditions and scenarios.

**Abstract** 

Since 2000, the National Park Service (NPS) has been inventorying acoustical conditions which have a direct implication to visitor experience and wildlife fitness. The NPS has a unique challenge due the vast quantity of land to manage, the diversity of acoustical environments therein, and the high standards to which these resources are upheld. Because empirically based estimates are a key variable in ecological assessments, geospatial sound models have been developed to leverage available data and comprehensively predict acoustic conditions across the United States. In this paper, we discuss the accuracy and limitations of these projections with an eye to NPS units. Acoustic conditions are summarized within park units to provide a measure of landscape context and a consistent comparison across park units. These summaries are analyzed in aggregate to provide big picture perspective, identify trends, and help inform effective management.

Keywords

noise model geospatial

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Kurt M. Fristrup, National Park Service

Lisa Nelson, National Park Service

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## **Evaluating restoration methods for an endangered butterfly**

What will I get out of this?

This presentation will provide information on innovative restoration techniques for disturbance dependent species, including a federally endangered butterfly.

**Abstract** 

Golden Gate National Recreation Area received NRPP T&E funding to scientifically test the efficacy of employing different disturbance methods of burning and soil scraping to enhance habitat for the federally endangered Mission blue butterfly. The Mission blue utilizes three species of disturbance associated lupine host plants. The park has had trouble growing and outplanting these host plants to enhance habitat. Results indicate that both burning and scraping treatments were effective in stimulating regeneration of lupine host plants for the butterfly. Mission blue butterflies were observed using treatment plots. There was a substantial increase in non-native plant cover in both the mechanical and prescribed fire treatment plots compared to the control plots. Erosion was not an issue on the study plots either. Project outreach included development of a Mission blue brochure, updated park website, as well as to support events related to the Mission blue butterfly Species of Year campaign.

Keywords

endangered, butterfly, restoration

Lead author / Session organizer

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Susie Bennett, Natural Resource Specialist, Golden Gate National Recreation Area

Christina Crooker, Stewarship Program Manager, Golden Gate National Parks Conservancy

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# The Nexus between Tourism, Conservation and Local Community Livelihood in Northern Tanzania

What will I get out of this?

Understanding the nexus between tourism, conservation and community livelihood may stimulate better planning and promote conservation and sustainable tourism in many rural areas

**Abstract** 

Keywords

given here

Tourism, conservation, livelihood

Tourism is considered by many international organizations and governments to have the largest multiplier effects compared to other industries. However, studies have shown that benefits accrued from tourism often do not reach local communities who are the custodians of natural resources. This situation often triggers local communities to develop negative attitudes towards tourism and protected areas. Studies show increasing trends of conflicts, hostility and insecurity for tourists in areas where tourism is not directly benefiting local communities. Studies have also demonstrated that if locals are not actively involved in planning tourism developments, it becomes much harder for protected area managers to gain their support for conservation initiatives. Elevated poaching of Africa's mega fauna in the recent past provides clear justifications of lack of local community support for conservation initiatives. This study evaluates the potential of tourism industry in mitigating poverty and promoting sustainable livelihood and conservation in rural northern Tanzania.

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7737 Poster

#### **Nature Fund for National Parks**

What will I get out of this?

Viewers will understand that a new non-profit is ready to start funding park natural resource projects and how decisions on funding will be made.

**Abstract** 

The Nature Fund for National Parks, an organization a few years in development, is now an approved 501 (c)3, with an expanding board. The organization is actively launching its fund-raising phase and has recently received its own grant from the National Park Foundation to ensure it is well-positioned for success as a new kind of friends group--one dedicated to funding for natural resource projects Servicewide. Parks should be aware of this potential funding source and how projects are selected for funding.

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funding

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Wildland fires limit the occurrence, severity, and size of subsequent fire

What will I get out of this?

We quantify the effectiveness and longevity of wildland fire as a fuel treatment.

**Abstract** 

Wildland fires can serve as fuel treatments in much the same way as mechanical thinning or prescribed fire. Federal fire policy fully supports the management of fire for multiple objectives and managers need to understand this fuel treatment effect when developing appropriate management responses to future fire events. Quantitative evidence is lacking for this treatment effect, how it varies by ecosystem, and how it decays over time. Using satellite imagery spanning 1972-2012 for four study areas in the Southwest and northern Rockies, we evaluated if wildland fire 1) reduced the probability of subsequent fires from occurring, 2) limited the size of subsequent fires by acting as fuel breaks, and 3) limited the severity of subsequent fires. Results show that wildland fires indeed limit the occurrence, size, and severity of subsequent fires, and that the strength and longevity of this effect varied by study area and ecosystem type.

Keywords

fire ecology, management

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**7772** Panel Discussion

The Role of Community Outreach and Interpretive Actions in Protecting Historic Park Resources

What will I get out of this?

Session explores the ways community outreach and interpretive actions can promote protection and appreciation of historical resources in parks and protected areas.

**Abstract** 

The purpose of this session, organized by participants in a 2014 George Wright Society Park Break session, is to explore the ways community outreach and interpretive actions can be utilized to promote the protection and appreciation of historical resources in parks, protected areas, and cultural sites. Using Keweenaw National Historical Park and Isle Royale National Park as examples of how limited awareness by community members can potentially threaten park resources, the panelists will present strategies and stimulate conversation encouraging community support and resource stewardship through outreach and interpretation. This session will facilitate discussion of best practices for community outreach, including considerations of diversity, interests, and accessibility, as well as examine what it means for a site to be "relevant" to contemporary and future audiences. This session will also consider the ways parks, protected areas, and cultural sites can engage non-local stakeholders through programs such as Park Break.

Keywords

Outreach, Interpretation

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Stephanie Sullivan, Graduate Student, University of Arkansas

Maija Glasier-Lawson, Graduate Student, Calfiornia State University-Chico

Mario Battaglia, Gradiaye Student, University of Arizona

## To shuttle or not to shuttle: Mass transportation on the Going-to-the-Sun Road

What will I get out of this?

Hear about the benefits and drawbacks of a free shuttle system and how scenario planning can help deal with uncertainties.

**Abstract** 

An optional free visitor shuttle was introduced into the Going-to-the-Sun Road Corridor to reduce traffic and maintain visitor experience during reconstruction. Benefits resulted from the shuttles, including reduction in traffic and high-quality experiences for visitors. Unintended consequences also resulted from the shuttle, including competition for parking and increased trail use. As construction ends, the park needs to retool the shuttle from a traffic management instrument to a visitor management instrument. A transportation and visitor use corridor management plan will provide the context for that decision. In this paper we discuss data that was collected to inform planning, the impacts to visitor experiences, access to trails, levels of traffic, and congestion under hypothetical future alternatives that do and do not include a free shuttle. We also discuss the use of scenario planning and considering uncertainty to inform the development of alternatives for the future conditions of the corridor.

Keywords

experience, planning, management

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Wayne Freimund, Ph.D., is a professor at the University of Montana and chair of the Department of Society and Conservation. He has spent nearly a decade conducting social science research at Glacier National Park.

Mary Riddle is the chief of planning and environmental compliance at Glacier National Park.

Douglas Dalenberg, Ph.D., is a professor at the University of Montana in the Economics Department.

Integrating citizen science into science, education, interpretation, and resource management

What will I get out of this?

Attendees will learn about our successes and failures in incorporating citizen science into core park activities, lessons that can help them in their parks.

**Abstract** 

The field of citizen science is growing rapidly. Many citizen science projects now exist, and more are starting all the time--many in national parks and other protected areas. These projects have great promise to improve science, education, and conservation outcomes. However, they are difficult to implement well. I will discuss our work in Acadia National Park and at the Schoodic Education and Research Center to incorporate citizen science into the core science, education, interpretation, and resource management activities in the park and research learning center. Our citizen science programs engage a variety of audiences (e.g., residents, day-visitors, and citizen science tourists) and explore many science questions, including ocean acidification, species interactions, mercury pollution, and historical records. I will also discuss our involvement in larger efforts to establish the new Citizen Science Association and to describe the potential of citizen science for natural resource management and policy broadly.

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citizen science

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The Future of Yellowstone Winter Use: A Collaborative Approach to Adaptive Management Program

What will I get out of this?

Audience members can learn from Yellowstone's model of developing an Adaptive Management Program through working groups comprised of the public and stakeholders.

**Abstract** 

For decades, Yellowstone's stakeholders have hotly debated the appropriateness of motorized oversnow vehicles (OSVs) in the park's winter landscape. They raised complex questions surrounding whether the park's resources were being impacted, and if so, how much was too much. Underlying this issue were deep-seated polarized values and a fundamental mistrust of both the NPS and other stakeholders. In October of 2013, Yellowstone National Park issued a new winter use Rule that appears to have ended this controversy. A central element of the final Rule is the implementation of a stakeholder-centric adaptive management plan. This presentation will address how Yellowstone has built a collaborative Adaptive Management Program with the support of six stakeholder working groups to address the dynamism and complexities of its winter landscape and to move from an era of mistrust to one defined by strong partnerships and a shared vision for the future of wintertime access to Yellowstone.

Keywords

Adaptive Management, Yellowstone

Lead author / Session organizer

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The U.S. National Park Service: Organizational Adaptation in an Era of Complexity, Uncertainty, and Change

What will I get out of this?

Audience will better understand some structural and cultural barriers to adapting to change and consider how the NPS can learn better as an organization.

**Abstract** 

Conservation agencies worldwide are facing rapid, volatile social and ecological change, which is especially problematic for bureaucratic, hierarchical organizations that are often resistant to change. The National Park Service (NPS) is one of these organizations that has acknowledged the need to better adapt to a changing environment. Revisiting Leopold: Resource Stewardship in the National Parks highlights the need for the NPS to adopt a new ideology better suited to complex social ecological systems. However, organizational change is challenging due to structural and cultural factors that stymie organizational learning and adaptation. Semi-structured interviews were conducted with managers across the NPS, revealing several systems archetypes and organizational learning disabilities that limit the ability of the NPS to embrace a new management and scientific paradigm. This presentation examines the NPS as a system and discusses leverage points that can be utilized if the NPS chooses to transform itself into this new paradigm.

Keywords

Organizational Change, Systems

Lead author / Session organizer

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Yellowstone's Non-commercially Guided Snowmobile Access Program: Creating sustainable solutions with diverse partners

What will I get out of this?

Audience members can learn from Yellowstone's experience with developing a highly controversial recreation program in partnership with diverse and often polarized stakeholder groups.

**Abstract** 

Over the past forty years, snowmobiling has become an intrinsic yet controversial part of the culture of Yellowstone and its surrounding communities. In 2004, after resource impacts and safety issues surpassed acceptable levels, Yellowstone restricted private snowmobile access and only allowed commercially guided tours. Following a decade of debate and lawsuits, the 2013 winter use Rule provided authorization the implementation of a Non-commercially Guided Snowmobile Access Program that includes a lottery system for permit allocation and a comprehensive education program to train members of the public to act as non-commercial guides. This presentation explores how the NPS worked together with a diverse group of stakeholders to build a pilot program designed to protect park resources and visitor safety and respond to the values of the local community. It will also examine the success of this program following the first season of implementation.

Keywords

Winter Use, Yellowstone

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7773
Invited Speakers

#### Man and Nature at 150

What will I get out of this?

"Man and Nature" by George Perkins Marsh was arguably the first environmental book published in North America. What can we learn from the events that spurred Marsh to write his warning?

**Abstract** 

"Man and Nature" by George Perkins Marsh was arguably the first environmental book ever published in North America. Though less well known, it is the Silent Spring of the land conservation movement. One hundred fifty years after Marsh put ink to paper, many of his warnings and observations are still relevant in contemporary conservation. What can we learn from the events that spurred Marsh to write his warning, and the response? How can our generation spark a new age of environmentalism? This session will feature a conversation with David Lowenthal, pre-eminent biographer of George Perkins Marsh, and author of The Past is a Foreign Country.

Keywords

writing, communication

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David Lowenthal, Professor Emeritus, University College London

Nora Mitchell, University of Vermont

Rolf Diamant, University of Vermont

9075 Update

### **Scaling Up & Private Protected Areas**

What will I get out of this?

Learn about the first US national conference on large landscape conservation, and about the first global assessment of private protected areas.

**Abstract** 

Scaling Up to work at landscape level is a National Park Service centennial priority. Large landscape conservation requires a fundamental shift in thinking and action, addressing social, economic and ecological systems. Collaboration is key, among different public land management agencies, with private NGOs, and connecting to other sectors. Join us for a double feature matinee! Learn more about the findings of the first national conference on large landscape conservation, including NPS Scaling Up team efforts. And hear about the first global assessment of privately protected areas, recently released. Come and share your stories in the discussion.

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Lead author / Session organizer

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Christina Marts, Assistant Superintendent, Marsh Billings Rockefeller National Park and Stewardship Institute

**Brent Mitchell** Chair, IUCN Specialist Group on Privately Protected Areas

renda Barrett, Living Landscapes Observer

7641 Workshop

### **Urban Matters: A Collaborative Path to Relevancy**

What will I get out of this?

Session attendees will be introduced to the NPS Urban Agenda, invited to join the Community of Practice, and brainstorm how to make it most effective.

**Abstract** 

The American population was 50% urban when the National Park Service was created in 1916. It is now over 80%, and increasing still. Much of the success of the National Park Service in coming years will depend on its ability to diversify and demonstrate its relevancy to new populations. Recognizing this need, NPS has developed an Urban Agenda through a Service-wide process of engagement. While the Urban Agenda is focused on the work of the NPS in metropolitan areas, new ideas and approaches to community-based stewardship tested and refined in urban national parks will engage yet-untapped constituencies as future stewards of their national park system. This workshop will extend that process of engagement, inviting staff and partners to participate in innovation in places where the people are.

Keywords

urban, collaborative, relevancy

Lead author / Session organizer

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Rebecca Stanfield McCown, Community Engagement and Partnerships Coordinator, NPS Stewardship Institute

Elle O'Casey, Program Specialist, NPS Stewardship Institute

Chris Spence, Director, Institute at the Golden Gate (to be confirmed)

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8038
Panel Discussion

### **Breakout Thinking in Difficult Times**

What will I get out of this?

Audience members will be challenged to move past any defeatism they might feel regarding current challenges, and explore ways to advance, remain current, address issues.

**Abstract** 

In difficult times, it's easy to blame circumstances, let them dictate inactivity (inertia), and accept the outcomes as unavoidable. Unfortunately, doing so has consequences for parks and protected areas, and the people who serve them. These consequences can lead to loss or impact to important resources. Resource managers, researchers and managers are facing budget sequestration, travel restrictions, conference attendance limits, limited research dollars, globalization, regional development pressures, and other challenges. The panelists will each explore a different aspect of the current management environment, give examples of breakout thinking that has help assure success and advancement despite challenges, and they will lead attendees in exploring options, with the hope that the discussions will benefit everyone in attendance.

Keywords

breakout thinking

Lead author / Session organizer Jerry Mitchell Retired (Chief, Biological Resource Management, NPS)

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Remaining current in your science, scholarship, and networking, and building credibility Gary Davis

Leveraging protected areas as economic generators, to reduce conflict and promote cooperation

Steve Shackelton

Keeping the research going

Jan van Wagtendonk

Partnering with universities

Brett Wright

Global parks, global collaborations, and shared global solutions

Doug Morris

7827
Panel Discussion

Making connections: Linking heritage of agricultural landscapes with community engagement and protected area conservation

What will I get out of this?

Emerging initiatives recognizing natural and cultural heritage on agricultural landscapes demonstrate ways to engage communities, contribute to sustainable practices, and advance conservation of protected areas.

**Abstract** 

Agricultural landscapes encompass almost 50% of the US and include places with important natural and cultural heritage. Yet this heritage is often overlooked and these agricultural landscapes are underrepresented in the nation's resource inventories and as part of protected areas. Today, these agricultural landscapes with heritage value face many challenges and it is timely to examine their conservation. Panel presentations describe initiatives by communities working in partnership with the NPS and other organizations to recognize the heritage values of agricultural landscapes in national parks and National Heritage Areas. Discussion will identify other examples and examine conservation strategies that engage communities, advance sustainable practices, and support economic revitalization. Discussion will also identify opportunities to further protect natural and cultural resource values of working agricultural landscapes and ways to connect to communities, protected areas and their regional landscape context. A summary of this session will be prepared for the conference proceedings.

Keywords

Agriculture, sustainability, engagement

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Sustainable forestry as a strategy for cultural landscape conservation

Christina Marts, Assistant Superintendent for Stewardship, Marsh-Billings-Rockefeller National Historical Park

Partnerships for sustaining agriculture at Martin Van Buren National Historic Site: Developing management guidelines
Bob Page, Director, Olmsted Center for Landscape Preservation, NPS

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Sustaining agriculture at Ebey's Landing National Historical Reserve: Reflections on progress and challenges
Nancy Rottle, Associate Professor, Department of Landscape Architecture and Director, Green Futures Research and Design Lab

Innovative ideas to recognize the cultural and heritage values of agricultural landscapes

Brenda Barrett, Editor, Living Landscape Observer

Another look at agricultural landscapes: Linking heritage values, community engagement, and sustainability

Nora Mitchell, Adjunct Associate Professor, University of Vermont

**7643** Sharing Circle

### **New Directions for Cultural Landscapes**

What will I get out of this?

Practitioners are taking a new look at the meaning and conservation of cultural landscapes. Share diverse perspectives on this concept and help shape its future.

**Abstract** 

The term cultural landscape encompasses a broad range of resources, values, and meaning. Organizers and participants will present brief updates on new directions in the field. These will include re-examination of the National Register of Historic Places definition of cultural landscapes, the concept of indigenous cultural landscapes and its application to the Chesapeake Bay watershed, and a perspective on various international approaches from the recent book, Conserving Cultural Landscapes. A moderated discussion will examine issues and opportunities presented by the breadth of landscape concepts and various scales. What is the role of existing criteria in recognizing cultural landscapes as a resource type? Should the definition of cultural landscapes be broadened to include places that challenge current ideas about integrity and conservation? How can protected area managers incorporate these ideas into landscape scale conservation? What can we learn from international practice? A short report will be prepared for the conference proceedings.

Keywords

cultural, landscapes, directions

Lead author / Session organizer

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Brenda Barrett, Editor, Living Landscape Observer

Applied Climate Change Science Supporting National Park Management in the US Northern Rockies and Appalachians

What will I get out of this?

The NASA-NPS Landscape Climate Change Vulnerability Project demonstrates decision support products for climate adaptation planning in national parks of the northern Rockies and Appalachians.

**Abstract** 

Climate change is accelerating in many ecosystems and initiating a complex cascade of ecological responses, challenging scientists and managers to understand and steward these rapidly changing systems. Integrating climate science into management poses several key challenges: management-relevant vulnerability assessments and adaptation responses are underdeveloped; the long time frames and large spatial scales over which climate impacts are manifest are beyond the scope of current agency management horizons; and differences in mission, capacity, and culture among federal agencies complicate coordinated management across jurisdictional boundaries. The NASA-NPS Landscape Climate Change Vulnerability Project (LCC-VP) has pioneered an approach for addressing these challenges and supporting climate change adaptation in two benchmark Landscape Conservation Cooperatives (LCCs), the Great Northern and the Appalachian. We describe LCC-VP results and outcomes for national parks in the two LCCs and explain the decision support products available to other LCCs and partners engaged in climate change adaptation.

Keywords

Climate-change, Adaptation, Decision-support

Lead author / Session organizer

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Patrick Jantz (Woods Hole Research Center)

Tom Olliff (Great Northern Landscape Conservation Cooperative)

John Gross (National Park Service Climate, Change Response Program)

Forrest Melton (California State University, Monterey Bay / NASA Ames Research Center)

David Theobald (Conservation Science Partners)

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Building integrated, multidisciplinary, and multi-organizational in the Albemarle Sound, NC

What will I get out of this?

The National Monitoring Network is an integrated, multidisciplinary, and multi-organizational program using multiple sources of data and information to improve monitoring of coastal waters.

**Abstract** 

The U.S. Geological Survey's (USGS) is implementing a demonstration project in the Albemarle Sound for the National Monitoring Network for U.S. coastal waters and their tributaries. The goal of the National Monitoring Network is to provide information about the health of our oceans and coastal ecosystems and inland influences on coastal waters for improved resource management. The network integrates biological, chemical, and physical features and links uplands to the coastal ocean. The purpose of the Albemarle Sound pilot study is to: 1) Inventory current monitoring programs in the Albemarle Sound, 2) Conduct a gap analysis to determine current monitoring needs, 3) Implement a monitoring program to address data gaps, and 4) Create a web-based map portal of monitoring activities. As part of the project, the USGS worked with stakeholders to inventory current programs and design a monitoring program. Results after 3 years of implementation will be discussed.

Keywords

Additional authors / organizers

**Estuary, Monitoring Network** 

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8058 Tabletop — electricity	Marine Protected Areas Atlas
What will I get out of this?	MPAtlas.org is a website to explore the curated MPA information.
Abstract	Launched in 2012, MPAtlas.org (Marine conservation as the most a
	progress around the world. Curre parks and reserves worldwide. MP
	Tracker. This tool is the only resonant information about efforts to estable
	track progress by country in achiev Convention on Biological Diversit
	to view and analyze data by a varie

plore the world's marine protected areas. This will be an exhibit of the tool and the

.org (Marine Protected Areas Atlas) is an interactive website and resource for most accurate and comprehensive source for gauging marine protected area Currently, visitors to the website can locate and learn about individual marine de. MPAtlas has many valuable features including —the MPA Campaign ly resource of its kind, providing a central location for the latest news and establish new marine protected areas around the world. MPAtlas will also achieving their MPA coverage goals including commitments under the viversity. We are also implementing many new query tools that will allow users a variety of social, political and ecological factors.

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Additional

Keywords

marine reserve, MPA

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## Visitors' Commitment to Grizzly Bear Conservation at Denali National Park

What will I get out of this?

The poster will provide the rationale, analysis, results, and strategies for increasing the impact of wildlife viewing on public lands.

**Abstract** 

Denali National Park and Preserve (DENA) receives more than 400,000 visitors annually and approximately 80% report viewing a grizzly bear (Anderson et al., 2010). Locations such as DENA rely on linking wildlife viewing and support for conservation. However, managers often need to identify visitors' perceptions towards specific issues or species. Therefore, during 2013 researchers investigated DENA visitors' (n = 472) commitment to grizzly bear conservation. The results of a segmentation analysis indicate five groups of visitors exist who differ in their commitment to grizzly bear conservation. The emotional impact from the grizzly bear viewing experiences was significantly different between these five groups, which suggests visitors' levels of conservation caring and willingness to engage in conservation actions are a function of the emotional impact born from the viewing experience. The poster will provide the rationale, analysis, results, and strategies for increasing the impact of wildlife viewing on public lands.

Keywords

grizzly bear, conservation

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### Human Dimensions of Winter Use in Yellowstone National Park: A Gap Analysis

What will I get out of this?

This presentation presents a format that can be used to identify gaps in research that may exist for multiple National Parks.

**Abstract** 

This presentation delivers the results of the first retroactive review of social science research regarding winter use in Yellowstone National Park (Bricker & Brownlee, 2014). To produce these results, researchers used a semi-inductive research synthesis process to analyze peer-reviewed periodicals, conference proceedings, government documents, and technical reports published between 1972 and 2013. Research themes were categorized into four groups: Visitor experiences, impacts to resources, park management, and the Greater Yellowstone Area. Although some dimensions within each theme have been sufficiently addressed by researchers, other topics have been largely neglected. The value of this presentation is to communicate the gaps in research at Yellowstone but more broadly for managers and researchers to understand how a research synthesis process can be used to identify data deficits at any park or protected area. The presenters will clearly explain this process and offer recommendations for implementation at a variety of protected areas and units.

Keywords

Yellowstone, Gap, Analysis

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**7695**Café Conversation

### **Cultural Resources in the Next Century**

What will I get out of this?

Participants will contribute to a companion document to the Cultural Resources Challenge.

**Abstract** 

2016 marks a host of anniversaries for cultural resources: the 110th of the Antiquities Act, the 100th of the National Park Service, and the 50th of the National Historic Preservation Act. Recent years have also seen anniversaries of the Wilderness Act, the establishment of National Heritage Areas, and more. All these point to the increasing emphasis on interdisciplinary resource stewardship over the NPS's first century. What will interdisciplinary work look like in the NPS next century, both within cultural resources and in working with natural resources, maintenance, and other fields? Join this collaboration session to share your ideas and experiences. The results will be compiled into a companion document to the Cultural Resources Challenge, now being implemented by the Associate Director of Cultural Resources.

Keywords

centennial, cultural resources

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7725
Sharing Circle

### National Park Service Servicewide Emeritus Volunteer Program

What will I get out of this?

Increase the capacity of existing NPS Emeritus Volunteer Program to provide benefit for urban youth and create an inclusive program reflective of today's demographics.

**Abstract** 

Secretary Jewell wants to substantially increase volunteerism on our public lands. As a bureau, the National Park Service leads the Department of the Interior in providing meaningful volunteer opportunities. The NPS Emeritus Volunteer program has primarily focused on capturing large scale landscape change, transferring institutional knowledge and providing technical expertise. The objective of this session is to identify specific mechanisms that need to be put in place so interested NPS retirees can seamlessly contribute their time and talents in urban areas thereby creating a more inclusive volunteer program, reflective of current demographics.

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Emeritus, urban, inclusive

Lead author / Session organizer **Lynne Murdock** Natural Resource Interpretive Specialist

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# **Enjoy The View: Capturing View Importance and Viewed Landscapes**

What will I get out of this?

Online editing and visualization of viewed landscapes for parks in support of the NPS Scenery Conservation Program

**Abstract** 

The NPS Scenery Conservation Program conducts park workshops to capture view importance and viewed landscapes as part of the scenic inventory activity, Enjoy the View, which is a Call To Action item. Park staff and volunteers gather scenic quality data and enter it into an online database from which maps and reports are generated. This database is spatially enabled in SQL Server in a generic, flexible manner which allows web browsers and, eventually, mobile clients like iPads to edit and visualize Enjoy the View data. This poster describes the Enjoy the View database and user tools.

Keywords

scenery, views, visualization

Lead author / Session organizer

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Advancing Understanding of Snowroad Rutting to Inform Policy in Yellowstone National Park

What will I get out of this?

Demonstrates the use of scientific methods to develop defensible policy that improves visitor experience and safety in the face of unique operational challenges.

**Abstract** 

Each winter, Yellowstone National Park maintains approximately 200 miles of snowroads to support administrative and commercial snowmobile and snowcoach traffic. Snowroads are primary mainline roads in the interior of the park which, after accumulating sufficient snowfall, are packed and groomed flat. Over the past several years, the park has seen an increase in the prevalence and severity of ruts in snowroads from snowcoaches which creates dangerous driving conditions. However, up until recently relatively little has been known about the causes of rutting or potential mitigation strategies. Over the past two winter seasons, park staff has investigated this phenomenon in attempt to identify contributing factors and ultimately propose a suite of potential actions to park managers to help alleviate or eliminate the issue. This presentation will focus on the methodology the park has developed, preliminary results from several phases and seasons of study, and preliminary policy implications stemming from this research.

Keywords

Yellowstone, Winter, Science

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Christina Mills, Outdoor Recreation Planner, Yellowstone National Park

## Rethinking Wintertime Oversnow Vehicle Transportation in Yellowstone National Park

What will I get out of this?

Demonstrates how stakeholder engagement and innovation coupled with scientific evaluation methods can facilitate innovative transportation solutions to reduce resource impacts and improve the visitor experience.

**Abstract** 

In 2013, Yellowstone passed a final Rule on Winter Use, one of the goals of which was to encourage innovation amongst snowmobile manufacturers and operators in order to improve resource protection and park operations. In partnership with the park, several snowcoach concessioners have proposed creative innovations for over-snow vehicles that could further reduce impacts, reduce costs, and improve safety and visitor experience. During the winters of 2013-2014 and 2014-2015, the park and these concessioners have begun testing the use of large, low-pressure tires on snowcoaches in lieu of traditional track systems. The park is monitoring and evaluating the experiment based on four criteria: safety, resource impacts, visitor experience, and vehicle capability. Preliminary results include a 250% fuel economy improvement (saving around \$200 daily per vehicle), 14 dB(A) noise emission reduction, and nearly unanimous visitor preference of low-pressure-tire vehicles over tracked vehicles.

Keywords

Yellowstone, Winter, Transportation

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Using Partnerships to Implement a Sustainable Energy System at the Lamar Buffalo Ranch Educational Campus

What will I get out of this?

Demonstrates implementation of a sustainable energy system at on off-grid, historic educational facility through cooperation between the NPS and private partners.

**Abstract** 

Yellowstone National Park Service and partners are currently in the process of updating the energy source and making energy-efficiency upgrades at the Lamar Buffalo Ranch, an off-grid, historic facility that now operates as an educational campus. The ultimate goal of the project is to use no fossil fuels in the facility's daily operations. This work is being accomplished with a combination of product donations and technical expertise from corporate partners, NPS staff labor, and monetary donations from partners to the Yellowstone Park Foundation. As the NPS faces increased cuts in federal funding, the role of non-profit partners is growing, and parks will increasingly face challenges in navigating these relationships. In addition, as the NPS increasingly focuses on reducing their greenhouse gas emissions and environmental impact, parks will need help strategizing about how to implement alternative energy and energy conservation projects, especially in uniquely challenging remote and historic locations.

Keywords

Sustainability, Partnerships, Facilities

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7726
Invited Speakers

Superstorms, Shutdowns, and the Future of Cultural Resources: A Gateway Case Study

What will I get out of this?

The session topic is the prioritization of cultural resources; a sustainable approach to cultural resource management given the realities of climate change and diminishing funding.

**Abstract** 

Gateway National Recreation Area includes over 500 historic structures, many of which are adjacent to water and are vulnerable to sea level rise and coastal storms. For years, the majority of the historic resources in Gateway have been vacant, in poor condition and in need of major capital repair. In order to allocate limited funding where it would have the most impact, the park's new General Management Plan systematically prioritized historic structures into three categories: Preserve, Stabilize and Ruin. With this process the park took the bold step of making the conscious decision to walk away from some significant cultural resources in the interest of being able to save others. This presentation will outline this process, discuss how Hurricane Sandy brought climate change into the conversation by making resiliency a primary consideration in prioritization, and raise for discussion some of the more difficult decision points for the park.

Keywords

**Cultural Resources** 

Lead author / Session organizer

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Long-term Monitoring of high-elevation white pine communities in Pacific West Region National Parks

What will I get out of this?

We present an overview of a collaborative approach to long-term monitoring of high-elevation white pine forest dynamics among three Pacific West Region I&M networks.

**Abstract** 

Several Inventory and Monitoring Networks (KLMN, SIEN, UCBN) have collaborated on a shared protocol to conduct long-term monitoring of several white pine species including whitebark pine (Pinus albicaulis), foxtail pine (P. balfouriana), and limber pine (Pinus flexilis). The goal is to provide park managers with information on the current status and trends of these foundational high elevation species. Permanent plots are allocated to random locations using an equal probability spatially-balanced approach. Tree- and plot-level data are collected on forest structure, species composition, incidence and severity of white pine blister rust (Cronartium ribicola), occurrence of mountain pine beetle (Dendroctonus ponderosae), and dwarf mistletoe (Arceuthobium spp) infection. Blister rust and mountain pine beetle occurrence within several of the network parks, coupled with projections of increased temperature and decreased precipitation in the region, portend future declines in white pine communities, underscoring the need for broad-scale collaborative monitoring.

Keywords

monitoring, white pine

Lead author / Session organizer

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# Communities of Practice Beyond Our Borders: Building an International Program at Yosemite National Park

What will I get out of this?

Engaging the global conservation community through an active international program provides opportunities to learn and to exchange ideas on shared management challenges.

**Abstract** 

Over the last several years, Yosemite National Park has been building an international program in order to engage with the global park community. This paper describes how we have done that based on existing relationships, budgets, and staff capacity, while ensure the relationships are long-term, productive, and collaborative. These efforts to create an international community of practice are set in the context of tight funding and complex resource management challenges, which are more than ever before linked to issues not only outside the boundaries of the park, but outside the boundaries of the United States. Engaging with the international community offers the opportunity share the collective knowledge and skills of the NPS, the chance to learn from the work of other park managers, and most importantly, to share our experiences in ways that produce new, innovative solutions and position us to better address the challenges of in the future.

Keywords

International, World Heritage

Lead author / Session organizer

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Mike Gauthier has been the Chief of Staff at Yosemite since 2010. Prior to Yosemite, Mike was a Bevinetto Fellow for the Assistant Secretary for Fish, Wildlife and Parks and for the Senate Subcommittee on National Parks. He has also served as park ranger at Mount Rainier, Olympic, and Denali.

Jodi Bailey joined the staff at Yosemite in 2013. Jodi holds a doctorate in Geography from the U.C. Berkeley where she specialized in international conservation, partnerships, and community development. She was a Fulbright Scholar and Aspen Institute Fellow and had conducted research in North and South America as well as the Pacific.

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An integrated approach to assessing pack stock behavior and resource use in Yosemite's high-elevation meadows

What will I get out of this?

Describes a geospatial assessment protocol of stock behavior and highlights integrated natural resource analysis options to support management of wilderness resources.

**Abstract** 

The use and management of stock animals for administrative, commercial, and private purposes in designated Wilderness areas of the Sierra is a litigious issue. This paper highlights an integrated approach using GPS tracking and behavior observation to concurrently quantify and spatially characterize stock movement and behavior in meadows and adjacent forested areas. Implemented in high elevation meadows of Yosemite National Park, the study identified intensely used habitats, preferred forage, and stock behavior dynamics. Preliminary findings highlight spatial associations of stock movement with natural features and environmental to focus management strategies for further monitoring efforts, mitigation of grazing impacts, and accommodating for stock use in wilderness. The potential and limitations of this methodology are also discussed.

Keywords

packstock, behavior, meadow

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Wei-Lun Tsai, Department of Parks, Recreation and Tourism Management, North Carolina State University

9071

# Examining soundscapes and potential management actions in Bandelier National Monument

What will I get out of this?

The results and methods of this study can inform soundscape, education, and visitor management in cultural resource-based protected areas in the United States and international5

**Abstract** 

While studies focusing on soundscapes have been conducted in several National Park Service units (e.g. Yosemite, Rocky Mountain, Sequoia and Denali), this is one of the first studies conducted in a cultural resource-based park unit --- Bandelier National Monument. In addition, this investigation examined visitor perceptions of potential management actions involving an intentional soundscape (i.e., traditional drumming and singing from the Ancestral Pueblo people). To better understand variables influencing visitor perceptions regarding soundscapes, this paper also examines the difference between first time and repeat visitors. Results from this analysis will inform managers and researchers about visitor's experience and preferences towards management actions pertaining to soundscapes, and how first-time and repeat visitors differ. We fully describe the methodological approaches and results that can be of use to other soundscape researchers and protected area managers. Additionally, the results can inform interpretive planning that can better protect soundscape conditions and visitor experiences.

Keywords

soundscapes

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7559 **Invited Speakers**  Shale Oil and Gas Development In and Near Parks: Technologies, Impacts, and Mitigation

What will I get out of this?

**Abstract** 

As oil and natural gas production in the U.S. intensifies, parks are faced with addressing and minimizing the direct and indirect effects to park resources and values from energy development. Shale oil and gas development in the U.S. is one of the most rapidly expanding trends in onshore domestic hydrocarbon development, particularly from the Bakken Shale in ND and Marcellus and Utica Shales in the eastern U.S. Session presenters will provide an overview of shale oil and gas development and the technologies that make it possible; and ways to mitigate the effects of oil and gas development including policy and regulatory tools, opportunities to collaborate with stakeholders and other agencies, air quality and viewshed analyses, and natural sounds and night skies modeling to help protect park resources and values. The session format will be six 15-minute talks by agency staff, each followed by a brief question and answer period.

Keywords

hydrocarbons, impacts, mitigation

Lead author / Session organizer **Lisa Norby** Energy and Minerals Branch Chief

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Additional authors / organizers Predicting Natural Ambient Sound Levels, the Spread of Noise from Energy Development, and Noise Impacts • Frank Turina, National Park Service, Natural Resource Stewardship and Science Directorate, Natural Sounds and Night Skies Division

Development of Shale Oil and Gas Through High Volume, Hydraulic Fracturing - Scale, Scope, and Concerns Lisa Norby, National Park Service, Geologic Resources Division

North Dakota National Parks: In the Midst of the Bakken Oil Boom Valerie Naylor, National Park Service (retired)

Shale Development in the Northeast Region: Booming Production Brings Challenges

Mary Krueger, National Park Service, Northeast Region

Hydraulic Fracturing: The Real Risks to Drinking Water Supplies Associated with the Subsurface Process

Pete Penoyer, National Park Service, Natural Resource Stewardhsip and Science Directorate, Water Resources Division

Air Resources and Viewshed Impacts and Mitigation

Andrea Stacy, National Park Service, Natural Resource Stewardship and Science Directorate, Air Resources Division

#### **Quiet Parks Initiative**

What will I get out of this?

Gain understanding of park noise sources. Learn about best management practices and technologies for minimizing park operation noise. Learn about opportunities to participate in QPI.

**Abstract** 

Acoustic data collected at national parks over the past decade indicate that routine park operations often comprise a substantial portion of park noise. In 2012, the National Park Service joined with the National Academy of Engineers (NAE) and the John A. Volpe National Transportation Systems Center to convene a workshop aimed at identifying best management practices (BMP) and best available technologies (BAT) for minimizing the noise generated by NPS activities. In three breakout sessions, the noise generated from transportation, construction and maintenance and facilities were examined. Recommendations from this workshop were published in the 2013 NAE report: Protecting National Park Soundscapes. The Quiet Parks Initiative incorporates recommendations from the workshop at parks throughout the NPS system. Components of the initiative include: identifying park-generated noise sources, implementing BAT/BMP, conducting education and outreach activities, and monitoring results. This presentation discusses the BAT/BMP recommendations and describes the Quiet Parks Initiative.

Keywords

noise,

Lead author / Session organizer

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<b>7647</b> Tabletop — electricity	We Tell Unique Stories; Your Stories
What will I get out of this?	Visitors to our poster table will learn how to effectively communicate science, environmental initiatives, and interpretation ideas to the public through film on the web.
Abstract	Social media and the web are now the most successful ways to reach large audiences with important conservation messages. Our poster will show examples of exciting and compelling science presented via short videos ideal for web posting. This approach can help interpreters, scientists, and environmental organizations to better communicate their messages in effective and unique ways to a huge audience.
Keywords	film, media, environment
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Additional authors / organizers	Jerry Freilich, National Park Service  Brit Hayford - Vice President/Producer
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## A Novel Approach to Non-native Invasive Plant Management in Saguaro National Park

What will I get out of this?

We wish to share the successes and shortcomings of using a helicopter to apply herbicides to manage an nonnative grass threatening the Sonoran Desert ecosystem.

**Abstract** 

Buffelgrass (Cenchrus ciliaris), a non-native invasive bunchgrass from Africa, is the primary threat to Saguaro National Park's natural resources and the Sonoran Desert. Years of ground-based management have not been able to keep pace with the spread of buffelgrass. After the completion of a Restoration Plan and Environmental Assessment in 2014, the Park added helicopter-based herbicide (glyphosate) applications to its toolbox. Aerial treatments were applied to buffelgrass monocultures, in steep and difficult to access locations. A vegetation monitoring protocol was established to evaluate treatment effectiveness and impact on native vegetation. Primary species of concern are the Park's namesake, the saguaro cactus (Carnegiea gigantea), and the palo verde tree (Parkinsonia microphylla). We wish to share the successes and outline the shortcomings of aerial application using our preliminary results and observations.

Keywords

Invasive, Helicopter, Sonoran

Lead author / Session organizer

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Invertebrates Everywhere! Using Collaborative Citizen Science to Document 5,000 Species in an Urban National Park

What will I get out of this?

Participants will see that new invertebrate species are everywhere, learn institutional collaboration lessons, and understand how to train and keep skilled volunteer citizen scientists.

**Abstract** 

Keywords

invertebrate, biodiversity, collaboration

Approximately 80% of life on Earth is an invertebrate. Many families of widely abundant insects are 35 -90% undescribed. This case study examines lessons learned on the George Washington Memorial Parkway, an eastern, urban national park that documented over 5,000 species. Urban national parks contain valuable habitat where a surprisingly large diversity of invertebrates still flourish. Nearby cities in northern Virginia and Washington D.C. provide many educated volunteers who can be inspired and trained to conduct the time-intensive field, lab, and curatorial tasks needed to document astonishing invertebrate diversity. Institutional collaboration with expert taxonomists and sustained support at the park level is needed to carry multi-year inventories to completion. Many newly documented species may have integrated pest control or other management considerations.

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### A GIS Analysis of Proximity to Parks and Crime in Greenville County

What will I get out of this?

Learn about methods and challenges of using GIS to investigate parks and safety.

Abstract

Increased crime is a common reason for opposition to parks and open space in communities. This project investigated the relationship between crime and parks in Greenville County using GIS to test the idea that parks lead to more crime in the surrounding neighborhood. Three methods were used to analyze the data – hot spot analysis, geographically weighted regression, and buffer analysis. The results revealed that different patterns emerge depending on whether the scale of analysis was large or small. The methods used showed that parks had an impact on crime in the immediate area and were able to map where proximity had the greatest influence on crime. The conclusion points to the likelihood of other factors, such as socioeconomic variables, contributing to higher amounts of crime in park neighborhoods. Challenges in data fragmentation and access will also be presented.

Keywords

Parks, GIS, Safety

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A.T. Seasons: Tracking Phenology from Georgia to Maine. A Large Scale Citizen Science Effort

What will I get out of this?

Demonstrates how a large scale citizen science effort can be used to monitor climate change. Speaking to the project partnership, design, goals, outcomes, and challenges.

**Abstract** 

Phenology is the study of the timing of plant and animal life cycle stages and how they relate to biotic and abiotic forces. Through the A.T. Seasons project, the study of phenology is being used to examine the short-term and long-term climatological changes occurring along the Appalachian National Scenic Trail (A.T). Because of its north/south alignment through the eastern U.S., the A.T. is well suited for a large-scale climate study. This project overview will discuss the A.T. Seasons partners (Appalachian Trail Conservancy, Appalachian Mountain Club, National Park Service, USA-National Phenology Network, Great Smoky Mountains NP) and the tools which they have designed and utilized to execute the project. The poster will include a description of the training structure and volunteer role as citizen scientists. The discussion of challenges, successes, and lessons learned will likely be of great value to viewers who are considering developing similar programs.

Keywords

Citizen Science, Phenology

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# Unprecedented Outbreak of Sea Star Wasting Disease in West Coast National Parks

What will I get out of this?

The significance/effects of this recent disease event, the importance of continued monitoring, and that this event may be a prelude of impacts from climate change.

**Abstract** 

An unprecedented outbreak of sea star wasting disease (SSWD) impacted at least 20 sea star species in the near-shore waters of the northeast Pacific during 2013-14, including all west coast National Park units from Olympic National Park to Cabrillo National Monument. Although SSWD events have occurred in the past, they were not of this magnitude in terms of the mortality rate, number of species affected or geographic extent. Sea stars such as Pisaster ochraceus play vital roles in structuring and regulating intertidal and subtidal communities. The potential loss of this keystone species is likely to result in cascading changes throughout coastal benthic communities. We summarize the incidence of SSWD and its demographic effects within NPS units, and present plans for continued sea star monitoring in the rocky intertidal zone.

Keywords

sea stars, disease

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Ben Becker, NPS Pacific Coast Science and Learning Center

Darren Fong, Golden Gate National Recreation Area

Steven Fradkin, Olympic National Park

Keith Lombardo, Cabrillo National Monument

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## Satellite Communications: Considering Park Issues through Geocaching

What will I get out of this?

The poster will illustrate a successful program in Everglades National Park, encouraging audiences to consider how geocaching applications could highlight resources in their own parks.

Abstract

Geocaching can generally be described as a location-based recreational activity that utilizes the Global Positioning System. Participants use GPS-enabled devices to located hidden objects using a set of furnished coordinates. Though experiencing rapid growth in popularity, the National Park Service has generally been cautious about allowing geocaching as a visitor activity. In 2012, Everglades National Park initiated a robust, year-long pilot program to assess the efficacy, reach, and impact of geocaching as an interpretative tool. The program garnered significant use, revealed potential for reaching diverse audiences, demonstrated success in advancing interpretive goals, and resulted in limited physical impact to cache locations. The results of this project suggest parks and visitors may derive mutual benefit from the development of interpretive geocache programs.

Keywords

**Everglades, Geocaching, Interpretation** 

Lead author / Session organizer

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# Protocol and case studies of using camera traps to monitor mammal communities

What will I get out of this?

Participants will learn about camera trap studies for monitoring mammal diversity, and a method for visualizing and organizing large photo data sets.

**Abstract** 

Camera traps are an emerging technology used in many national parks for a wide variety of purposes. However, many parks and protected areas generate large wildlife photo data sets that are often never organized, managed, or used efficiently for management and monitoring. We present a new camera trapping protocol for monitoring mammal communities in national parks and US Fish and Wildlife Refuges in the southwestern United States, and focus on the results of case studies from 3 parks: Saguaro NP, Chiricahua NM, and Fort Bowie NHS. We describe a method for allowing more efficient labelling, quality-control, retrieval, and visualization of camera trap photos so that they can be easily accessed by researcher, managers, and interpreters. Our goal is to be able share data among parks and other natural areas so as to maximize the conservation value of camera traps.

Keywords

camera trap, mammals

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Jason Mateljak, Chief of Resource Management, NPS Southeast Arizona Group

Lacrecia Johnson, Zone Biologist, Fish and Wildlife Service, National Wildlife Refuge System

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# Bridge or Barrier? Race/Ethnicity, Visitor Typology, and Differences in Perceived Transportation Accessibility to/within National Parks

What will I get out of this?

This paper focuses on barriers to engagement of underrepresented visitors to national parks, which are crucial to understand for sustained stewardship of our lands.

**Abstract** 

National parks are democratic entities, established and managed for the collective good, including conservation of important resources and enjoyment and appreciation by the people. Transportation is a vital bridge in helping the national parks fulfill their democratic mission. However, transportation can also be a barrier to visitation, as national parks may not be equally accessible to all Americans. We conducted a study of this issue by administering a survey to visitors at five diverse park units (urban, urban-adjacent, and rural) and residents of New York City, with questions addressing the role of transportation in visiting national parks. The study found significantly different levels of agreement with perceived transportation obstacles and incentives to visitation, dependent upon race/ethnicity and type of visitor/non-visitor status. Study findings have implications for park and transportation management and contribute to the literature on the relevance of national parks to minority racial/ethnic groups and across the rural-urban continuum.

Keywords

access, minority, urban

Lead author / Session organizer

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"Parknerships" across the Cityscape: Multi-organizational Approaches to Enhancing Connections between People and Place

What will I get out of this?

This paper focuses on how land management organizations can leverage their strengths in effective, cost-sharing partnerships to reach a wider range of local audiences.

**Abstract** 

The long-term viability of national parks relies on our collectively engaged stewardship of these areas. Engaging people as stewards is predicated on the relevance of parks to their lives. The National Park Service (NPS) has recognized this relevancy link as a crucial and under-utilized element in creating stewardship connections, especially with urban communities. Engaging fully with these communities, however, cannot be accomplished solely intra-agency; the NPS increasingly relies on augmenting community in-roads through partnerships. We conducted a study in a large metropolis with a prominent NPS presence to elicit roles that 1) parks play in the cityscape and 2) partnerships play in connecting people to these parks. Through interviews with park and non-profit managers (n=14), themes emerged pertaining to the roles of parks and partnerships in supporting and engaging proximate urban audiences. This study's findings have applicability to knowledge of collaborative action models and park management beyond administrative boundaries.

Keywords

relevancy, partnership, urban

Lead author / Session organizer

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8067

Assessing long-term vegetation change in dryland national parks using remote sensing and plot-based monitoring data

What will I get out of this?

The audience will learn how to use remote sensing to monitor vegetation in national parks.

**Abstract** 

Managing protected areas under drought and climate change requires information on vegetation types that are most vulnerable to increases in aridity. Remote sensing data can supplement plot-based assessments of vegetation condition, while expanding the spatial scale and the frequency at which monitoring is conducted. We present preliminary results of a landscape vulnerability analysis of parks in the Northern Colorado Plateau I&M Network by integrating a time series (1989-2009) of Landsat imagery and long-term plot data. To improve detection of low vegetation cover in these dryland parks, we examine the sensitivity of two vegetation indices to changes in plant cover: the Normalized Difference Vegetation Index (NDVI) and Soil-Adjusted Vegetation Index (SAVI). We found that compensating for soil brightness effects in the SAVI index resulted in a greater dynamic range of index values and greater detectability of vegetation change. Initial analyses reveal a linear relationship between remotely-sensed vegetation indices and plot-measured cover.

Keywords

vegetation, dryland, Landsat

Lead author / Session organizer

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7754
Panel Discussion

Call to Action #38: Enjoy the View – protecting clean air and treasured views

What will I get out of this?

Air and visual resources face diverse threats. Learn from parks addressing these cross-boundary issues by participating in Call to Action item #38: Enjoy the View.

**Abstract** 

Call to Action item #38: Enjoy the View, aims to protect clean air and treasured views in parks through resource assessment and cooperative conservation. Over the past two years there has been a groundswell of interest from parks seeking guidance and a consistent approach, especially for evaluating scenic views. Delaware Water Gap NRA, Chaco Culture NHP, Gates of the Arctic NP & Pres, Catoctin Mountain Park, and Monocacy NB have all taken the plunge and now have stories to share. Come learn about the cross-boundary issues these diverse parks are facing and how the Enjoy the View process works. Presentations will also address the National Park Service role of providing information and speaking to the value of air and visual resources for visitors and future generations. Finally, a sneak peek at the Enjoy the View products including air quality assessments and visual resource products will be shared.

Keywords

visual-resources, air, park-experience

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Leonel Arguello; Chief of Vegetation Management, Redwood National Park

Jim Von Haden; Natural Resources Program Manager, Chaco Culture National Historical Park and Aztec Ruins National

Laws of nature, historical contingency, and the wolves and moose of Isle Royale National Park

What will I get out of this?

We link dynamics of a predator-prey system to unanticipated events, and show how these may explain natural dynamics better than usual concepts of population dynamics.

**Abstract** 

Are dynamics of natural populations best explained by law-like principles or historical contingencies? Our ability to understand and predict nature depends on the answer. We develop here the historical contingency hypothesis (HCH), which states that population dynamics can be partially understood as a series of random events characterized by legacy effects that are comparable in length to the waiting time between such events, and the disparate nature of individual events in the series. Using predation rate to characterize the dynamics of wolves and moose in Isle Royale National Park, we show that law-like patterns – i.e., density dependent processes and inter-annual fluctuations in climate – explain about a third of the variance in predation rate. By comparison, a few historically contingent events (disease, severe winter, genetic rescue event) explain about half of that variance. The HCH may be relevant at all temporal and spatial scales.

Keywords

predation, population, prediction

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### Sampling Cave Crickets: not your textbook design

What will I get out of this?

Audience members will learn a specific approach to sampling irregular targets, that a wide set of techniques exist, and where in NPS to get help.

**Abstract** 

Cave crickets roost on walls and ceilings of irregular passageways near cave entrances. Even if those surfaces are mapped, they don't correspond to a simple surface where random quadrats are easy to define. Further, crickets aggregate into clumps; and most random samples will have no crickets. We defined a sample frame as rings of wall surface perpendicular to a baseline, indexed by distance along that baseline. Strip adaptive cluster sampling, an efficient sampling technique for clumped populations, was used with those sample units. Finally, GRTS was used to draw distances along the baseline, so that the monitoring data would be sensitive to not only changes in cricket abundance, but also to shifts in roosting locations toward or away from the cave entrances. While textbook designs taught in college may be too simple to meet our needs, a wealth of useful but less-known techniques exist in applied and environmental statistics.

Keywords

monitoring, sampling, cave

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## Critical Connections: Conserving Migratory Species in Alaska Parklands

What will I get out of this?

This program provides new opportunities for collaborative conservation and compelling public outreach by utilizing evolving technology to understand year round movements of Alaska's migratory birds.

**Abstract** 

The Critical Connections Program provides new opportunities for collaborative conservation and provides exceptional opportunities for compelling and effective public outreach. This program will help the NPS master the science required to recover and maintain the ecological integrity of parks and improve the scientific literacy of the citizens of this nation. Many migratory birds range across extraordinary distances and encounter a wide range of risks to survival and reproduction throughout their lifetime. The causes of recent declines observed in migratory species are likely to be found either along their migration routes or on their wintering grounds. We will develop critical information and develop a dynamic program that links research results directly to management and conservation actions and expands and enhances partnerships and public education.

Keywords

migration, conservation, geolocators

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## CCC Historic Designed Landscape: Opportunities to Expand Interpretation of Park History and Cultural Resources

What will I get out of this?

Examine CCC historic designed landscape at Chiricahua NM. Explore different interpretive approaches to educate public and staff, illustrate value of integrated resources, importance of preservation.

**Abstract** 

The majority of older national parks and monuments contain historic designed landscapes. With the hand labor of the Civilian Conservation Corps and engineering talents of Park Service design teams, roads and trails, park structures, and recreation facilities were constructed to maximize visitor opportunities and minimize ecological intrusions. These cultural resources are significant because they link the natural resources of each park, its history of development and use to national themes of the Great Depression, work programs of the New Deal, and natural resource conservation. Yet in many parks this important story remains largely untold or inadequately interpreted. As we approach the Centennial, we really should look backward to celebrate each park's development. These designed landscapes offer a valuable canvas to reinterpret for the visiting public NPS' historic role in national recreation development and its modern one in protecting cultural resources still in use today.

Keywords	landscapes, interpretation, CCC
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9011 Workshop Addressing the capacity development needs of indigenous, traditional, and local community protected area stewards

What will I get out of this?

Contribute to a developing WCPA program for capacity development by/with/for local and indigenous communities and provide feedback on major issues, goals, objectives for future action.

**Abstract** 

IUCN is working to increase the effective and equitable management of protected areas through a comprehensive capacity development program. A widespread program of activities and consultations led by the IUCN WCPA Capacity Development Work Group during 2013, 2014, and the World Parks Congress in Sydney generated a draft 'Strategic Pathways for Capacity Development in Protected Areas and other Conserved Territories' (SPCD) document. The SPCD describes the current situation concerning protected area capacity development, identifies major issues that need to be addressed over the next decade, and recommends pathways, goals, and objectives for future action. A particular emphasis is to ensure that capacity development initiatives move beyond outreach to include and address the specific needs of indigenous, traditional, and local community protected area stewards. We are seeking broad input and feedback on the current document, and during this workshop will present the goals and objectives identified so far and discuss avenues for improvement and implementation.

Keywords	Capacity development, indigenous
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#### **US/ICOMOS: Bringing you a World of Heritage Solutions**

What will I get out of this?

Learn how US/ICOMOS is enhancing access by CRM peers around the world to the best new US heritage practices, research and science, and vice versa.

**Abstract** 

Since its founding 50 years ago, US/ICOMOS has worked to deliver the best of international historic preservation and heritage conservation work, including professional approaches and results, to the U.S. domestic preservation dialogue. At the same time, in a collaborative approach, US/ICOMOS has shared and interpreted for the world the unique American historic preservation system. This presentation will introduce the US/ICOMOS 50th anniversary Knowledge Exchange initiative, which promises to supplement our traditional face-to-face programs with new digital and virtual efforts, with a special focus on the following themes: (1) Cultural Landscape practice (both rural and urban, with a focus on connecting natural and cultural professional practice); (2) Heritage as a Pillar of Sustainable Economic Development, (3) Climate Change and Heritage, (4) Heritage, Disaster and Resilience, (5) World Heritage management and the US World Heritage Tentative List and (6) Telling the Stories that Make up America's Diverse National Identity.

Keywords

international, landscapes, climate

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Native plant recovery after exotic fennel (Foeniculum vulgare) control on Santa Cruz Island, CA

What will I get out of this?

Demonstrates the benefits of site evaluation, native seed augmentation, and follow-up monitoring after invasive species control; and, without disturbance native shrubs outcompete non-native annual grasses.

**Abstract** 

Santa Cruz, the largest of California's Channel Islands, supports a diverse flora. Sheep, cattle, and pigs, introduced in the mid-1800s disturbed the soil, browsed vegetation, and facilitated the spread of invasive plants. Recent removal of introduced herbivores led to the release of invasive fennel (Foeniculum vulgare), which expanded to become the dominant vegetation in some areas and impeded the recovery of Coastal Sage Scrub. The park controlled fennel on the eastern portion of the island, then established replicate paired-plots in two locations to evaluate the effectiveness of native seed augmentation following fennel removal. Five years after fennel removal, exotic cover (primarily non-native annual grasses) decreased significantly (p=0.0001) as native cover increased significantly (p<0.0001) in seeded plots in one location, while the second location produced very different results. This paper discusses competition between native shrubs and non-native grasses, and the importance of long-term monitoring and native seed augmentation in restoration projects.

Keywords

invasive, competition, recovery

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## Planning and Implementing a Surface Water Mapping Project on Santa Rosa Island, California

What will I get out of this?

Will learn to plan, implement complex surface water mapping projects using GPS/GIS. Results have application across numerous disciplines and will inform complex water management decisions.

**Abstract** 

Santa Rosa Island, at 217 km2, 484 m HP, and 35.5 cm average precipitation, is rugged, geographically diverse and second largest island in California's Channel Islands. It was heavily impacted by over 150 years of intensive grazing by non-native animals. NPS removed the non-native grazers (cattle, pigs, deer, and elk) and recovery of plants and wildlife is occurring. Changes to the hydrologic system are also expected due primarily to recovery of native vegetation and climate change. The park systematically mapped surface water during the driest time of year to establish baseline hydrologic data. This involved identifying 2nd, 3rd, and 4th order streams; naming each tributary; assigning teams of two armed with Garmin, camera, radio, data sheets, and paper maps to find specific tributaries and record UTMs for all water features. Thirty-one mappers worked during two weeks in September 2014 to cover 335 stream kilometers and map 1,117 water features.

Keywords

Water, map, GIS

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Restoring coastal wetland and riparian areas while protecting archeological resources, Santa Cruz Island, Channe Islands NP

What will I get out of this?

Audience will learn new, effective methodology for planning wetland restoration. Plans had to include strategies and methods for simultaneously protecting archeological resources.

**Abstract** 

Prisoners Harbor, site of the largest backbarrier coastal wetland on the Channel Islands, was occupied by Chumash people for 5,000 years until the 1830s. Ranchers filled the wetland in the late 1800s to build corrals and transportation facilities. They also channelized a creek, disconnecting it from the wetland and causing erosion of a Chumash archeological site. In 2011 the park removed 10,000 yds3 of fill to reestablish wetlands and reconnect the creek and its floodplain. In the process, a historic stone wall was unearthed and midden sites were discovered, requiring on-the-ground design changes. 15,000 native wetland plants were installed and interpretive corrals and wetland observation platforms were built to improve visitor experience. Invertebrates and amphibians colonized ponds within weeks of exposing groundwater, and migratory waterfowl and resident landbirds soon followed. The park and partner The Nature Conservancy now plan to restore 20 acres of riparian woodland upstream of this site.

Keywords

wetlands, restoration, hydrology

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## Mapping Seeps, Springs, Ponds, and Streams on Santa Rosa Island, CA

What will I get out of this?

Hear about technique for mapping perennial water in arid regions and concept that will connect on-the-ground field work with research.

**Abstract** 

Santa Rosa Island, the second largest island of California's Channel Islands, was heavily impacted by over 150 years of intensive grazing by non-native animals. NPS removed the non-native grazers (cattle, pigs, deer, and elk) and recovery of plants and wildlife is occurring. Changes to the hydrologic system are also expected due primarily to recovery of native vegetation and climate change. In Fall 2014, following 3 years of very low rainfall, the park will map all seeps, springs, ponds, and streams by physically walking 194 miles of 2nd, 3rd, and 4th order steams. Consumer-grade GPS units were used to record water feature locations. Linear referencing along a pre-determined stream channel was used to quantify length of visible water within the stream channel. These data provide a baseline for long-term trends in surface water, a better understanding of vegetation/groundwater/surfacewater interactions, and characterize areas for ecological research.

Keywords

streams, hydrology, mapping

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Analysis of the Rangewide Population Genetics of the Black Oystercatcher (Haematopus bachmani)

What will I get out of this?

How research with scientific and management value within protected areas in different agency jurisdictions can be developed through partnerships with several organizations.

**Abstract** 

This study has been designed to advance the understanding of the black oystercatcher's (Haematopus bachmani) genetic variability and distribution throughout a large portion of the range of this species (from Mexico to Alaska). Numerous research and land management organizations have discussed the importance of studying this species (reviewed in Belkin 2011). This study builds on recent documentation of many occupied black oystercatcher territories that are known to be located along the large latitudinal gradient of the California Coastal National Monument (CCNM) managed by the Department of the Interior's Bureau of Land Management, and recent population genetics and productivity studies. This study will provide all organizations involved with managing the habitat of this species a rangewide understanding of the overall population structure. This study has been important in developing and advancing research and management partnerships in the Pacific Coast region with the CCNM and many other agencies and nongovernmental organizations.

Keywords

partnerships, population genetics

Lead author / Session organizer

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Papers and additional author list is in development.

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Sandra Talbot, Ph. D., U. S. Geological Survey: Sandra Talbot

Conservation Gain: Restoring Ecological Integrity and Hope in Parks Canada's National Parks

What will I get out of this?

Highlight exemplary conservation outcomes and innovations from projects that aim to restore ecological integrity and connect Canadians and park visitors to nature.

**Abstract** 

Parks Canada Agency (PCA) is mandated to maintain or restore ecological integrity across its 44 National Parks. We do so using key principles and guidelines, developed by PCA and recognised globally by IUCN, for effective, efficient and engaging management intervention. Under our Conservation and Restoration Program (CoRe), we strive to achieve measureable conservation gains for the highest priority issues, reporting publicly every five years. The current instalment of CoRe represents the most significant and comprehensive investment in ecological restoration ever undertaken by PCA. Through illustrative case studies, this presentation will highlight exemplary conservation outcomes from recent projects and innovations from current projects that aim to restore ecological integrity and connect Canadians and park visitors to nature.

Keywords	restor	ation, P	Parks Canada
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### NPS Launches New Air Quality Data Products Web Page

What will I get out of this?

Audience members will learn about a new tool that provides easy access to air data and resource summaries used to inform resource management decisions.

**Abstract** 

In collaboration with Colorado State University, NPS Air Resources Division will launch its new air quality data products web page in early 2015. This presentation will showcase how the web page integrates enhanced data visualization with resource information to produce timely and relevant management and decision support tools. This toolset assimilates complex datasets, risk analyses, trends, and condition assessment for primary indicators (ozone, visibility, and atmospheric deposition) the NPS uses to evaluate air quality in national parks. Air data and resource summaries for over 350 NPS parks will be available via user-friendly interface that allow resource managers, the public, federal land managers, students, and teachers to view air data products in real-time. Please join us to explore the air quality data products web page through a demonstration, hear about the utility of the toolset, and offer your comments.

Keywords

air; database; communication

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Shawn McClure, Software Engineer, Cooperative Institute for Research in the Atmosphere, Colorado State University

Brett Schichtel, Physical Scientist, National Park Service - Natural Resource Stewardship and Science: Air resources Division

Jenny Hand, Research Scientist, Cooperative Institute for Research in the Atmosphere, Colorado State University

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**7675** Panel Discussion

Sister Parks — Sharing Lessons Learned and Exploring New Opportunities in Developing Effective International Partnerships

What will I get out of this?

As "Sister Parks" become an important way NPS engages internationally, this session will address how to make these partnerships more effective, mutually beneficial and strategic.

**Abstract** 

Over the last 10 - 15 years, many NPS sites have developed "Sister Park" partnerships with parks and protected areas around the globe. Some of these have flourished, while others floundered. What are the keys to forming successful, long-term and sustainable international partnerships? In this session, several NPS staff engaged in sister parks will share their lessons learned, challenges addressed and ideas to make these partnerships as effective and beneficial as possible. Examples of both long-standing and relatively new Sister Park partnerships will be highlighted, with a lengthy discussion for all participants to help identify the keys to ensuring strong partnerships with international colleagues.

Keywords

Sister Parks, international

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Ben Bobowski, Chief of Resources Management, Rocky Mountain National Park

Herbert Meyer, Paleontologist, Florissant Fossil Beds National Monument

#### From Sister Parks to Family Parks: Exploring New Concepts to Network Common Themes

Herbert Meyer, Paleontologist, Florissant Fossil Beds National Monument

U.S. - Mexico Sister Parks: Protecting Shared Resources and Heritage

Darla Sidles, Superintendent, Saguaro National Park

Rocky Mountain National Park's International Partnerships

Ben Bobowski, Chief of Resources Management, Rocky Mountain National Park

Russell Galipeau, Superintendent, Channel Island National Park

Carol Mitchell, Everglades National Park

**7884** Invited Speakers

Renewable Energy Development Case Studies and Applications for Enhanced Resource Protection

What will I get out of this?

The scientific and land management community has made huge advances in identifying and mitigating impacts to protected areas. Learn about new tools and techniques.

**Abstract** 

Driven by federal and state policies and financial incentives, our nation is experiencing a rapid expansion in renewable energy development and related electric transmission upgrades, in a widespread effort towards creating a "New Energy Frontier." While these efforts are laudable from climate change, air quality, and homeland security standpoints, many of the pilot projects are sited near parks, cultural sites, and other protected areas and have the potential to cause direct and landscape-level adverse impacts to protected and treasured resources. This session relies upon specific case studies of applied science to explore the efforts of the scientific community to create better tools for siting, design, mitigation, and monitoring for the next generation of renewable energy projects. Each speaker will present cutting edge updates, followed by joint panel-style discussion and Q&A with the audience.

Keywords

renewable energy mitigation

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Characterizing Tribal Cultural Landscapes for resource preservation and protection during renewable energy Valerie Grussing, Ph.D., Cultural Resources Coordinator, National Marine Protected Areas Center, National Oceanic and

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Utilizing visual impact evaluation for offshore renewable energy development in protection of National Seashore viewsheds Mark Meyer, National Park Service

Landscape Alteration: Assessing Visitor Impacts from Wind Energy Development surrounding Southwestern U.S.

Susan McPartland, Visitor Use Specialist, National Park Service

Rethinking mitigation: A Case Study on Mitigating Solar Development near Joshua Tree National Park

Andrea Compton, Chief of Resources, Joshua Tree National Park

Utilizing Facilitated Dialogue to Interpret Energy Development for the Public

R. Sky McClain, Interpretive Specialist, National Park Service

**7873** Panel Discussion

### The Collaborative Process for Creating a New Energy Frontier

What will I get out of this?

Engage with leadership from organizations that at the forefront of the new energy frontier and help advance the conversation on how to deploy green energy while protecting treasured places.

**Abstract** 

The development of renewable energy projects on public lands and in federal waters has reached a watershed moment in our Nation's history. The Department of the Interior and its partners are working to create a "New Energy Frontier" that decreases our dependence on foreign oil and reduces greenhouse gas emissions by providing clean energy opportunities for the public. Agencies have been working together with stakeholders to plan for development that is "Smart from the Start," which limits adverse impacts while maximizing public benefit. The scientific community is addressing these impact concerns, and to help create tools for better planning, design, mitigation, and monitoring. The panel moderator will lead a facilitated discussion between agency managers on how they have utilized planning processes, interagency collaboration, science, and guidance to address these issues. The panel will also discuss, with audience participation, next steps and the role of the scientific community.

Keywords

renewable energy development

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Michael Sintetos, California Renewable Energy Program Manager, Bureau of Land Management

David Lamform, Pacific Region Associate Director, National Parks Conservation Association

7762 Workshop

### **Connecting City Dwellers with Nature Where They Live**

What will I get out of this?

We have both attended national and international conferences to better inform our urban strategies. To achieve significant interdisciplinary shifts the conversation needs to be elevated.

**Abstract** 

As of 2006 we are now an urban species worldwide. What are the implications for our conservation and education work in urban environments with urbanite audiences? Every city offers vital opportunities to promote sense of place, eco-literacy and a stewardship ethic. Where and how people interface with the natural world—whether direct contact or representations from street murals to museums—typically happen in an eclectic landscape of learning and experience. For more than a decade San Francisco has been a laboratory for a wide variety of initiatives to more effectively cultivate an informed and engaged lifelong relationship to place. This workshop will share an inventory of efforts to date (and their challenges) followed by share-outs on best practices in other cities, and collective brainstorming of what is required to achieve our education and conservation goals with urban dwellers in the 21st Century.

Keywords

urban, education, conservation

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Elishama Goldfarb
Ecological Educator/Literacy for Environmental Justice
Anthony Khalil

Audience analysis survey over time (1995, 2005, 2015) regarding La Primavera forest, Guadalajara, Mexico, identifying visitor profile and communication channels shifts

What will I get out of this?

Attendees will learn how audiences in Guadalajara Metropolitan Area do communicate and preferred channels are to learn about natural resources, as well as shifts over time.

**Abstract** 

The presentation reports on three general surveys (1995-2005-2015) that have been conducted regarding La Primavera forest, a natural protected area. Visitor profile, opinions, and communication channels and preferences among audience in Guadalajara area, Mexico have been identified. The same questionnaire has also been utilized to study audiences regarding other natural areas in the region so that it has been useful to compare among natural areas.

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Hurricane Sandy Dune Overwashes in Fire Island's High Dune Wilderness Area and Subsequent Vegetation Recovery.

What will I get out of this?

Vegetation recovery and coastal habitats are rebounding after Hurricane Sandy

**Abstract** 

One of the most significant natural impacts to park lands from Hurricane Sandy was dune overwashes. These overwashes pushed sand northward into the interior of the island, burying the coastal habitat that existed behind the former dune. Overwash areas were monitored for vegetation recovery and data quickly showed coastal habitats rebounding. Incorporated into the overwash vegetation monitoring, deer exclosures were constructed around a subset of vegetation plots. The exclosures were built to determine if the abundant white-tailed deer (Odocoileus virginianus) population was influencing the habitat recovery. Thus far, data indicates that the total percent cover of vegetation is higher in exclosed plots vs open plots suggesting white-tailed deer may be influencing vegetation growth in the overwashes. More research needs to be completed to determine if deer herbivory is a significant impact to the recovery of the coastal habitats impacted from Hurricane Sandy.

Keywords

**Hurricane Sandy, Vegetation** 

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## Utilizing Research and Monitoring to Inform Appropriate Management of Rare Maritime Forests on Fire Island

What will I get out of this?

How research can be used to inform appropriate management of forests. See how vegetation monitoring can be used to assess the efficacy of deer management.

**Abstract** 

There are a few pockets of rare maritime forests within the boundaries of Fire Island National Seashore. The most famous being the Sunken Forest, which is a critically imperiled habitat and is one of only two known old-growth maritime holly forests in the world. Analysis of a dataset that dates back to nearly half a century has identified the major drivers that have influenced changes within this forest. These major drivers include; white-tailed deer herbivory, erosion, sea-level rise, and storms. To understand more about other maritime forests on Fire Island, new vegetation plots were deployed in 2012. These forests share similar trends to the Sunken Forest and appear to be experiencing the same pressures. Recent vegetation surveys will be used to assess the efficacy of deer management. How can the Seashore use this information to mitigate other impacts such as sea-level rise or more frequent storm events?

Keywords	Vegetation, deer, sea-level	
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# Vegetation Monitoring in Conjunction with Fire Island National Seashore's Deer Management Plan

What will I get out of this?

Fire Island National Seashore's use of vegetation monitoring to evaluate the efficacy of deer management

**Abstract** 

There are a number of rare maritime forests within the boundaries of Fire Island National Seashore. For example, the Sunken Forest is one of only two known old-growth maritime holly forests in the world. Managing rare maritime forests have become a challenge due to the increasing browsing pressure by white-tailed deer (Odocoileus virginianus). In response to the Seashore's concerns with its deer population and decreasing understory, the Seashore is developing a white-tailed deer management plan/EIS. The plan/EIS has initiated a study to monitor maritime forests on Fire Island utilizing permanent vegetation plots established in the 1960's, when deer were rarely seen on Fire Island, and newly established plots. Thus far, data collected in 2011-2013 shows that the total percent cover of ground layer vegetation is extremely low compared to the data from the 1960's and seedling recruitment targets developed in the deer plan are not being met.

Keywords

deer, vegetation, browsing

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## Collaborative Watershed Restoration in the Paige Boulder Watershed, Whiskeytown National Recreation Area

What will I get out of this?

Watershed restoration restores natural upland hydrologic flow regimes and reduces sedimentation to downstream Critical Habitat in lower Clear Creek.

**Abstract** 

n 1997, a debris torrent started from a failed logging road in the upper elevations of Paige-Boulder watershed. The debris torrent destroyed two bridges and flooded a building at the Whiskeytown Environmental School and deposited an estimated 195,000 yds3 of sediment into Paige Boulder and lower Clear Creek. Paige-Boulder is the highest priority watershed for restoration at Whiskeytown because its highly erosive headwaters discharge to the designated Critical Habitat for Central Valley steelhead and spring-run Chinook salmon, both federally listed T&E species. Chronic sediment transport and debris torrents and flows from Paige-Boulder watershed continue to compromise the cooperative salmonid restoration in lower Clear Creek. A cooperative watershed restoration project with the NPS and California Department of Transportation will begin May of 2016 in the Paige Boulder watershed by removing 6.8 miles of abandoned relict logging roads to reduce sedimentation to lower Clear Creek.

Keywords	
ad author /	

watershed, salmon, restoration

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#### The Lifecycle of Planning in NPS Wilderness

What will I get out of this?

People will gain a better understanding of the many NPS plans that shape wilderness from its beginnings to a unit of the national wilderness system.

**Abstract** 

Keywords

or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here Wilderness, Planning

The NPS prepares a number of planning documents for areas that are eligible, proposed, recommended, and designated as wilderness. This includes park foundation documents, wilderness eligibility assessments, wilderness studies, wilderness stewardship plans, and backcountry management plans. Other plans also affect the management of wilderness areas, such as resource stewardship strategies, commercial services plans, visitor use management plans, fire management plans, and trail management plans. There is a lifecycle for planning in wilderness areas, as a park area moves from being considered for wilderness designation to becoming part of the national wilderness preservation system, and as an area becomes more popular and attracts more agency attention. Different plans are started at different times and have varying degrees of effect on an area's wilderness character, resources, and visitors. This poster looks at the interrelationships among the various planning products and how they relate to the NPS wilderness review and management process.

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authors / organizers		
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7799
Panel Discussion

### The IUCN WCPA Protected Area Capacity Development Initiative

What will I get out of this?

Learn about how you can be involved in the programs featured at the World Parks Congress that can improve global protected area management capacity.

**Abstract** 

To address the problem of a large proportion of the world's protected areas losing resources as a result of inadequate management, IUCN's Global Protected Areas Program and WCPA are working in association with CBD, regional training centers and other partners to increase the effective and equitable management of protected areas through a comprehensive capacity development program. This panel will describe the components of a plan that was featured in the 2014 World Parks Congress. It will describe: A strategic framework for developing and evaluating CD programs; the creation of a global register of competences for protected area professionals; the creation of a Body of Knowledge and certification guidance for PA professionals and the establishment of a new Global Partnership for Professionalizing Protected Area Management. This panel will build understanding of the Program and create an interactive venue for participants to provide feedback and have an opportunity to become involved.

Keywords

Capacity, global, training

Lead author / Session organizer **David Reynolds** Senior Advisor

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#### Capacity Development and the World Parks Congress

Ernesto Enkerlin-Hoeflich, Chair, IUCN World Commission on Protected Areas (WCPA), Mexico

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Strategic Pathways for Capacity Development in Protected Areas and other Conserved Territories (SPCD)

David Reynolds, IUCN WCPA

#### Evaluating conservation capacity development

Ana Porzecanski, Director, Center for Conservation and Biodiversity, American Museum of Natural History, USA

Review of the results of the WPC Pre-Congress capacity development sessions

Jim Barborak

#### **Brokenhead Wetland Interpretive Trail**

What will I get out of this?

A successful partnership between provincial government, First Nation, conservation organization, and their "angel" to protect a rare wetland area and share it with the world.

**Abstract** 

The Brokenhead Wetland Ecological Reserve protects a calcareous fen and the springs that feed the fen within a rare white cedar forest community. The Brokenhead Ojibway Nation has been using this wetland for hundreds of years and it continues to be a place of great cultural importance and a place for collecting medicinal plants, berries, and cedar. Orchid lovers and eco-tourists visit the wetland to see the many beautiful and rare plants found there. Although this area is wonderfully attractive, for safety reasons and because it is easily trampled, individuals were not encouraged to visit. Through a partnership with Debwendon Inc. and with operational funding support from the Eugene Reimer Environment Fund, Manitoba Parks has constructed a floating boardwalk that will allow people to safely visit the area for aesthetic, educational and cultural reasons without causing damage to the native plants and their habitat.

Keywords

Ecotourism, wetland, Indigenous

Lead author / Session organizer

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Peggy Bainard Acheson, President, Native Orchid Conservation Inc., Debwendon Inc.

Carl Smith, Chair, Debwendon Inc., Brokenhead Ojibway Nation

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Cotton River, Market Town: Interpreting the Landscape of Slavery at Forks-of-the-Road, Natchez NHP

What will I get out of this?

Learn about efforts to interpret the historic slave market site, Forks-of-the-Road, in Natchez, MS, using nested landscape narratives at multiple scales.

**Abstract** 

In spring 2013, the author conducted a studio with graduate students focused on research and interpretive planning for the Forks-of-the-Road former slave market site in Natchez, MS. The site was the second largest slave market site in the South, after New Orleans, and received slaves for sale via overland routes along the Natchez Trace, as well as by boat from New Orleans, which offered an opportunity to interpret the regional impact of the site and the complex web of connections that map across it at the local, regional and national scale. The team worked with community activists and the Natchez National Historical Park to develop a range of multi-scalar interpretive/design proposals that interweave narratives of slavery at the regional, city, and site scale, focusing on the natural and cultural resources associated with the site, as well as broader intersecting narratives provided within the local urban and rural agricultural landscapes.

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Forks-of-the-Road, slavery, interpretation

Lead author / Session organizer

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7578 **Panel Discussion** 

#### Outside Your Door: Urban Youth Media Producers Create New Connections to the Land

What will I get out of this?

We discuss creative methods for engaging diverse young people with production of media, by youth for youth, as a vehicle connecting them with outdoor spaces.

**Abstract** 

Each decade a new trend, issue, or area of inquiry surfaces about how best to engage urban youth. The Forest Service, for example, has increased their outdoor and environmental initiatives engaging young people with the outdoors and increasing public support. This panel will discuss how scholars at San Francisco State University collaborated with the Bayview-Hunters Point Center for Arts and Technology (BAYCAT) to explore cultural diversity, youth, media, and connections or barriers to outdoor enjoyment. Through this innovative project, we investigated the impact of media and communication on urban youth by involving predominantly ethnic minority youth as media producers. They were asked to examine their relationship with the outdoors to generate images and messages they believe will encourage other young people to explore public lands. In this session we'll detail project objectives, explain methodology, share results and recommendations (for USFS and other public land agencies), and facilitate discussion among attendees.

Keywords

Youth, Outdoors, Media

Lead author / Session organizer Nina Roberts Professor

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#### (See notes provided at end)

Dr. Nancy "Sami" Reist, Professor, SF State University, Department of Broadcast Electronic Communication Arts

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(see notes provided at end) additional speakers/panelists

Dr. Kristen Pozzoboni, Assistant Professor, SF State University, Department of Child & Adolescent Development

Tanvi Sikand, Research Associate, SF State University

#### (see notes at end)

Villy Wang, Executive Director, Bayview-Hunters Point Center for Arts and Technology

#### (see notes at end)

Jose Alfaro, Production Manager, Bayview-Hunters Point Center for Arts and Technology

## Modeling snow water equivalent in Yosemite National Park

What will I get out of this?

A physically-based snow model capable of simulating forest canopy elements can provide spatially-explicit information about climate warming forest vulnerability where snow is shifting to rain.

**Abstract** 

Seasonal snowpack in California's Sierra Nevada forms a natural reservoir that sustains the ecosystem during the summer dry season. While snowpack vulnerability to climate warming is understood at the scale of the entire mountain range, less is known at a scale relevant to resource managers. We employ a rigorous snow energy and mass balance analytical model to estimate snow depth and water equivalent over the Tuolumne and Merced River basins at 100-meter spatial resolution. Model results are evaluated using multiple independent snowpack observations including snow depth and SWE from distributed sensor networks and NASA's Airborne Snow Observatory. At this scale, the model may be used to evaluate changes to ecosystem water availability and timing due to forest fire or other disturbances. The energy balance approach allows evaluation of snowpack under future climate or forest density without relying on typical temperature-index approaches that may have limited applicability in a changing climate.

Keywords

snow, hydrology, forest

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Roger C. Bales, University of California Merced

Thomas H. Painter, NASA Jet Propulsion Laboratory

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The Washington Cascades Butterfly Project – Monitoring Subalpine Butterflies as Indicators of Climate Change

What will I get out of this?

This project will relay the challenges and success of a volunteer program conducted in a Wilderness park.

**Abstract** 

The Cascades Butterfly Project is a long-term citizen science project that monitors subalpine butterfly populations in the Cascade Mountains of Washington. The project was initiated in 2011 to establish a baseline of butterfly populations; detect trends in subalpine butterfly populations as climate changes; and engage the public in these efforts. Monitoring is conducted in North Cascades National Park Service Complex, Mount Baker-Snoqualmie National Forest, Mount Rainier National Park, and Okanogan-Wenatchee National Forest. Volunteers survey butterflies along permanent routes following the Pollard Walk method. Our greatest challenge is attracting volunteers who are willing to hike 4-8 miles to our study sites, often with a gain of up to 3,000' in elevation. Despite this, the number of returning volunteers has increased each year as has the number of volunteers skilled enough to conduct surveys independently. Over the last four years, 35 volunteers have devoted over 800 hours and documented 35 butterfly species.

Keywords

butterflies, citizen science

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Challenges, opportunities, and priorities for bat conservation in a 2nd-century National Park Service

What will I get out of this?

A continental perspective on the potential contribution and strategic recommendations for coordinated bat conservation across the National Park system in the coming decades.

**Abstract** 

North American bat populations face unprecedented threats from white-nose syndrome, the rapidly expanding footprint of the wind power industry, and accelerated climate change. The network of parks and protected areas within the National Park system has tremendous potential to support coordinated resource protection, disease surveillance, and population monitoring that could become a cornerstone of 21st century bat conservation. In support of this vision, we review the biogeographic information contained in NPS databases about bat species occurrences and the availability of key bat resources, including caves and mines, across the NPS. We evaluate this information against published range maps; the spatial pattern of discrepancies reveals important knowledge gaps where additional inventories are needed most. This review provides a macroecological perspective on the bat conservation challenges facing the agency and suggests opportunities and strategic priorities for NPS as it begins its 2nd century.

Keywords

bats, conservation, biodiversity

Lead author / Session organizer

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Tom Philippi, Inventory and Monitoring Division, National Park Service

Bill Monahan, Inventory and Monitoring Division, National Park Service

Paul Cryan, US Geological Survey

## Native bee biodiversity in national parks: essential, beautiful, and hidden

What will I get out of this?

Audience learns about pollinator biodiversity across the country in lands protected by the NPS and how some of these populations are threatened by climate change.

**Abstract** 

How many species of native bees depend on NPS protected habitats service-wide? Fifty? Two hundred and fifty? The number is probably closer to a thousand. Insect biodiversity is often overlooked when NPS managers think about the resources they protect even though these communities provide critical ecosystem services. A three year study of native bees in climate sensitive habitats in 50 different national parks has already identified more than 650 species and we are still counting. High elevation, coastal, and arid areas are particularly vulnerable to climate change and these areas are often hot spots for bee and plant endemism. This talk will highlight results from the study, discuss how climate change might affect native bee populations, and amaze you with the beauty and diversity of native bees when they are viewed up close.

Keywords

bees, climate change

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Sam Droege, USGS Patuxent Wildlife Research Center

Dr. Ralph Grundel, USGS Great Lakes Science Center

Allison Klein, Yellowstone National Park

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Yellowstone National Park's Climate Change Program II: Extracting useful information from piles of data

What will I get out of this?

easily analyze weather station data and gridded climate data in a variety of ways to better understand climate trends

**Abstract** 

Using web and desktop based analysis tools developed by our climate change program, we have estimated long-term trends in snowpack, temperature, and precipitation for the area in and around Yellowstone National Park from weather station output and gridded data products. We are nesting the results from various spatial (regional, park, and local) scales and temporal (daily, monthly, annual, and 30 year "normal") increments to better understand the complexity of long-term climate change. More important than the statistical results, is the process of evaluating the often conflicting sources of information and arriving at a set of clear conclusions that can be applied to resource management decisions. It has taken us several years of experimentation to develop a set of metrics that are both relevant to ecosystem processes and reliable. This talk provides a discussion of this evaluation process, describes lessons learned, and reports on some interesting results.

Keywords

climate change, Yellowstone

Lead author / Session organizer

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Connecting the Dots: Using public transportation to access public lands. The CARLESS California Project.

What will I get out of this?

This inter-agency project reveals best practices for connecting inner city underserved audiences with parks and protected areas in California by utilizing public transportation.

**Abstract** 

CAR-LESS California is an inter-agency project designed to improve seamless and sustainable access to parks and protected areas via alternative transportation systems (ATS) for everyone, especially low-income communities with low vehicle ownership. The Pacific Southwest Region (Region 5) of the Forest Service is conducting a multi-FLMA (Federal Land Management Agency), multi-partner, long range alternative transportation planning effort to promote a cultural shift to ATS as a primary choice for reaching outdoor recreation on public lands. As California adds 400,000 to 500,000 residents annually, a cultural shift toward choosing public forms of transit is essential for preservation of California's natural and cultural resources while also improving access for all populations. This poster reveals results of public listening sessions, focus group input, and field testing of the potential of linking ATS with public lands.

Keywords

Transportation, underserved audiences

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## Incorporating Citizen Science into Natural Resource Monitoring Projects at Cabrillo National Monument

What will I get out of this?

Audience will learn about the benefits of incorporating citizen volunteers into science-based projects, specifically lessons learned at Cabrillo National Monument over the past 20 years.

**Abstract** 

Cabrillo National Monument's Hartzog award-winning volunteer program has proven to be a benefit to the park by providing effective support for resource monitoring programs. For over 20 years, citizen scientists have assisted park staff in data collection. The scope and breadth of resource monitoring programs (e.g. shorebird surveys, intertidal and herpetological monitoring) have expanded due to the reliable service of volunteers. The quality of volunteer-collected data is often questioned; however, preliminary evidence from Cabrillo NM indicates that data collected by volunteers is robust and of value to park management. While Cabrillo NM has done well to capitalize on its proximity to a large urban metropolis, demographic data suggests that the park has yet to tap the full potential of the San Diego area.

Keywords

citizen, science, Cabrillo

Lead author / Session organizer

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Tavio Del Rio: Cabrillo National Monument

Bonnie Phillips: Cabrillo National Monument

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7683 Invited Speakers

## Challenging the History and Future of Non-Indigenous Conservation Models

What will I get out of this?

Learning from indigenous stewardship models and perspectives on nature to deconstruct assumptions about dominant conservation paradigms, and inform more holistic directions for future conservation efforts.

Abstract

Gisele Maria Martin and Hawk Rosales have been deeply involved in remarkable conservation movements in Vancouver Island and California that resulted in the declaration of indigenous peoples' "wilderness" and "park" areas established and stewarded by Tribal First Nations. They will discuss key principles underlying traditional systems of cultural knowledge that, for countless generations, have produced biologically diverse and abundant ecosystems, and will explain their unique movements through presentations of compelling photos and inspiring stories. They will chronicle Tribal First Nations' histories of loss, and the revitalization of connections with ancestral territories. The origins of ideas informing non-indigenous conservation models will be examined, along with dominant attitudes toward nature, indigenous peoples, and conserving land. Attendees will: gain greater understanding about the meaning of conservation; experience deconstruction of widely held assumptions embedded in non-indigenous conservation paradigms; and emerge better informed about how more holistic approaches should be incorporated into future conservation efforts.

Keywords

Indigenous, First Nation

Lead author / Session organizer Hawk Rosales Executive Director

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Gisele Maria Martin, Independent Consultant, Citizen of Tla-o-qui-aht First Nation

Tla-o-qui-aht Tribal Parks: A First Nation Network of Culturally-Managed Ecosystems

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Oisele Marta Martin, independent Consultant, Citizen of Tra-o-qui-ant Frist Nation
InterTribal Sinkyone Wilderness: Stewarding Ancestral Coastal Lands & Waters
Hawk Rosales, Executive Director, InterTribal Sinkyone Wilderness Council

### Pollinator diversity in northern and high elevation parks: research and outreach

What will I get out of this?

Gain awareness of the diversity and ecology of pollinators, how little is known about these essential ecosystem service providers in parks, ways to share information.

**Abstract** 

Keywords

pollinator, oureach, inventory

Bees and syrphid flies comprise a dominant component of the pollinator fauna in northern and high elevation wilderness areas. Despite their essential role in maintaining plant communities and functioning ecosystems, most resource managers have virtually no information on pollinators in their parks. In an effort to build a baseline pollinator database in several Alaskan and Pacific Northwest parks (Denali, North Cascades, Olympics), I conducted an inventory of bees and syrphid flies, using traps and net-collecting. The effort yielded more than 2000 bees (in five families) and 700 syrphid flies, including many new state records, at least one species new to science, and one species known to be in severe decline in other parts of its range. A variety of methods were used to convey research findings to park staff and visitors, including campground and visitor center presentations, hands-on microscope sessions, fact sheets, and an interactive "virtual tour" of park pollinators.

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### Tectonically Induced Uplift and Exhumation in Joshua Tree National Park

What will I get out of this?

Understanding the tectonic strain induced on the park by the San Andreas Fault, guides management decisions about research activities and scientific partnerships.

**Abstract** 

Vertical deformation along the 1100 km transform boundary between the Pacific Plate and the North American Plate in California is difficult to constrain at spatial and temporal scales. Only in areas where plate obliquity creates locally converging boundaries, are the manifestations of vertical deformation readily observable. Along the southern boundary of Joshua Tree National Park is an area where 27 degrees of plate obliquity creates a locally converging margin of the San Andreas Fault (SAF). Tectonically induced uplift and exhumation rates are constrained by apatite fission tracks and helium dating techniques. Rates of uplift are inversely proportional (decrease) with distance away from the SAF which is indicates of a northerly tilt in the southern mountain ranges of the park. In addition to the vertical deformation that has already occured-27 degrees of plate obliquity- is imparting horizontal drag- throughout the western half of the park leading to increased seismicity.

Keywords

**Tectonics Uplift Seismicity** 

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Impacts of CBET on Poaching Reduction and Livelihood Change around Nyungwe National Park, Rwanda

What will I get out of this?

This paper will demonstrate the challenges of integrated development and conservation strategies in developing countries where enterprise development has been the centerpiece of conservation

**Abstract** 

Loss of biodiversity in Nyungwe National Park, a protected area in southwestern Rwanda has been a major concern to the government of Rwanda. To reduce this threat, the government invested in Community Based Ecotourism Initiatives (CBETi) around the park to improve the socio-economic livelihood of communities as an incentive for conservation. Six CBETi initiatives around Nyungwe National Park were selected for this study using opportunistic and snowballing sampling. Semi-structured interviews with community cooperative members and focus group interviews with community/ opinion leaders and park managers were conducted. This study also analyzed ranger based monitoring (RBM) data of illegal activities from 2008-2012 as well as community socio-economic status. The study findings show that given the large population of communities around Nyungwe National Park and poverty levels, CBETi's have neither been able to improve the socio-economic livelihoods of communities nor alter illegal activities and other threats to the park.

Keywords

eco-tourism, poaching, communities

Lead author / Session organizer

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Ingrid Nyonza Nyakabwa, MSc. Student at Clemson University in the department Parks, Recreation and Tourism Management.

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Invited Speakers

The History of Geology and Geologic Resource Management in the U.S. National Parks

What will I get out of this?

In consideration of the upcoming NPS Centennial, this session will provide a venue to highlight the agency's rich history of geology and geologic resource management.

**Abstract** 

Since the creation of Yellowstone National Park in 1872, geology and geologic resources management have featured prominently in the history of the national parks. Volcanoes, geothermal features, mountains glaciers, arches, canyons, sand dunes, barrier islands, caves, fossils and other geologic phenomena are often the primary resource for which many national parks and monuments have been established. The geologic features, processes and landscapes represented in the U.S. National Park System have provided and continue to provide important opportunities for scientific research, public education and outdoor recreation. Many principles of geologic conservation and preservation have been forged by pioneering geologists and resource management specialists working in the national parks. The rich history of park geology has abundant accounts of human determination and scientific discovery. This session will attempt to highlight some of that history that has shaped America's geologic heritage throughout the National Park System.

Keywords

NPS, Geology, Geoheritage

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Preserving the Geologic Resources and Geologic Landscape at Yellowstone National Park

Lee Whittlesey, Historian, Yellowstone National Park

Hands-on Geologic Resource Management: Watershed Restoration at Redwood National Park

Dave Steensen, Chief NPS Geologic Resources Division

A Historical Perspective on Cave and Karst Management within the National Park Service

Dale Pate, NPS - National Cave and Karst Program Coordinator

Preserving Fossils in the National Parks: A History

Vincent L. Santucci, Senior Geologist / Paleontologist, NPS Geologic Resources Division

Born of Fire - The History of Volcanology in the National Park System

Laura C. Walkup, Physical Science Technician, Yosemite National Park

7993 Tabletop — electricity	Hunting with Non-lead
/hat will I get out of this?	Audience members will walk away with an understanding of a growing threat of lead poisoning in wildlife and
Abstract	With studies demonstrating health impacts to over 135 wildlife species worldwide from spent lead ammunition, there is an urgent need for information on how to use non-lead ammunition and what options are available. This exhibit provides up-to-date and accessible information on why and how to use non-lead ammunition. Pinnacles National Park has pioneered a robust non-lead outreach and education program working on local, regional and national levels. These efforts in concert with intensive training and practice using non-lead ammunition provide many lessons learned and have inspired partnerships with other agencies and organizations with similar goals. With partners, we have also designed educational tools including brochures, banners, videos and a website. To further the NPS goal of getting lead out of park operations, we invite other park units and partners to request educational materials and contact us with any questions.
Keywords	non-lead, lead, ammunition
Lead author / Session organizer Additional authors / organizers	Scott Scherbinski Wildlife Health Outreach Coordinator Pinnacles National Park scott_scherbinski@nps.gov

### Making the Switch to Non-lead Ammunition: Lessons Learned and Resources Available

What will I get out of this?

Audience members will walk away with an understanding of a growing threat of lead poisoning in wildlife and tools to mitigate that threat.

**Abstract** 

The NPS requires use of non-lead ammunition in park operations because of the negative impacts of spent lead ammunition to scavenging wildlife including eagles and condors. There is a great need for up-to-date and accessible information on why and how to use non-lead ammunition and available options. As a host site for endangered California condor reintroduction, Pinnacles has pioneered a robust non-lead outreach and education program working on local, regional and national levels. These efforts in concert with intensive training and practice using non-lead ammunition provide many[RW1] lessons learned and have inspired partnerships with other agencies and organizations with similar goals. With partners, we have also designed educational tools including brochures, banners, videos and a website. To further the NPS goal of getting lead out of park operations, we invite other park units and partners to request educational materials and contact us with any questions.

Keywords

non-lead, lead, ammunition

Lead author / Session organizer

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Daniel Ryan, Pinnacles National Park

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## **Climate Change Adaptation in Denali National Park**

What will I get out of this?

Denali National Park's purpose and fundamental resources are being affected by climate change. Park staff are faced with deriving adaptation strategies to address these impacts.

**Abstract** 

Vistas from the park road, wildlife habitat, and fire regimes are already being impacted by climate change. These issues will be presented along with proposed adaptation strategies and the pros and cons of potential management actions. A key aspect of the debate, the trade-off between "natural" and "untrammeled" within the context of wilderness management, will be developed for each climate change adaptation strategy.

Keywords

Climate, adaptation, wilderness

Lead author / Session organizer Dave Schirokauer Chief of Resources

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Additional authors / organizers

### Conceptual Basis for Mapping Geomorphological Evolution in Coastal Parks

What will I get out of this?

Provides theoretical foundation for maps that document geomorphological evolution within coastal parks, and that have scientific value and natural resource management implications.

**Abstract** 

The conceptual approach to describing, depicting, and mapping the geomorphological characteristics of coastal parks is based on the components of morphometrics, causative processes, and temporal sequence of development of the surface. This tripartite organization is the essence of modern geomorphological maps that combine the processes and the surface expression of the sedimentary formations. A categorization of surface features was developed for Fire Island NS, Assateague Island NS, and Gateway NRA to track the evolution of the geomorphology within these coastal parks. The continual alteration of surface features by ambient environmental conditions and significant storm events, such as Superstorm Sandy, both underscores the importance of the geomorphological map and provides a challenge to maintaining an accurate dataset. Initial maps created prior to Superstorm Sandy (October 2012) were remapped considering the post-storm topography. The post-Sandy maps offer a contemporary portrayal of the geomorphology and present an opportunity to quantify geotemporal changes.

Keywords

geomorphology, mapping, coastal

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#### **Urban Youth and the Outdoors: Messages that Resonate**

What will I get out of this?

Attendees will gain a better understanding of youth perspectives and themes that can be used to motivate youth and stimulate interest in the outdoors.

**Abstract** 

The physical and mental health benefits that spending time in nature can have on humans is well documented. Americans, especially youth, are increasingly distanced and disconnected from natural areas. Carefully crafted messaging, particularly, through social media, has the potential to influence youth perspectives, interests, and engagement with the outdoors. The objective of this ongoing project is to isolate key messages that resonate with urban youth regarding outdoor experiences. Researchers conducted a series of ten focus groups with youth ages 11-19 in the Los Angeles, CA basin. Upon transcribing, coding, and analyzing data from the sessions, six messaging themes emerged: challenge, adventure, escape, social connections, novelty, and access. The themes are consistent with theory, but provide an interesting look at approaches to increasing the motivation and engagement of a population segment that will be important to the future of parks and protected areas.

Keywords

youth, messaging, motivation

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### Advocating for Natural Resources in the Heat of Incident Management

What will I get out of this?

Participants have a deeper understanding of the pressures of incident response that balance protecting lives and property while being sensitive to advocating for natural resources.

**Abstract** 

Natural resources in protected areas are increasingly under pressure from catastrophic events such as wildfires, oil spills, and other emergency incidents. To manage these events, the mission of the National Park Service's emergency response community is dedicated to defending lives and property while protecting, restoring, and maintaining healthy ecosystems. There are many pathways to reach this goal including training incident resource advisors; integrating response protocols into stewardship plans; and creating collaboration between incident and resource management communities. All facets are critical to protect resource values. We hope to enlighten through our experiences to highlight the need for resource involvement in incident response.

Keyv	vords
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**Resource Advisor** 

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### American Innocence: Race and National Park Service Interpretation

What will I get out of this?

Some parks interpret racial matters openly and honestly; others are remarkably inadequate. The Service should — and can — seek excellence in all racial interpretation.

**Abstract** 

Generally, the National Park Service seems proud of the attention it pays to racial issues, including its interpretation of sites in the national park system where racial matters are front and center. Concerns about inclusiveness and fairness to minority groups got its first big boost in the 1960s. However, half a century later and through close examination I have encountered parks where the Service is satisfied with interpretation of racial matters which are inadequate, misleading, and exceptionally poor. Such interpretation is unfair to minority groups and promotes the idea of "American Innocence"-that historically this country has been guilt-free regarding treatment of non-whites. Although certain parks have excellent interpretation involving racial issues, the National Park Service can-and must-do better than this. There are ways at hand to accomplish true Service-wide excellence.

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interpretation, racial matters

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The Greater Yellowstone Ecosystem Grizzly Bear Distinct Population Segment: Prospects for Possible Inter-ecosystem Dispersal for a Species Facing Delisting

What will I get out of this?

This case study asks whether the GYE grizzly bear should be delisted when translocations will subsequently be needed to thwart the loss of genetic diversity.

**Abstract** 

Keywords

corridors, planning, isolation

The grizzly bear (Ursus arctos horribilis) in the lower 48 states is now confined to five subpopulations. The aim of this study was to qualitatively gain insight into the likelihood of grizzly bear dispersal between: (a) the Greater Yellowstone Ecosystem (GYE) and the Northern Continental Divide Ecosystem (NCDE), (b) the GYE and the Selway-Bitterroot-Frank Church River-of-No-Return Wilderness Complex (SBWA), and (c) the NCDE and the SBWA. Confirmed bear dispersal data was located and compared with data showing the location of roads and super-highways and human population density. GYE or NCDE bears are not using modeled 1997 "least-cost pathway" corridor routes, and this finding represents a rare of example of a modeled corridor later examined with real dispersal data. Instead, NCDE bears appear to be moving slowly in a southerly direction towards the GYE and SBWA and from the GYE towards the SBWA. The US Fish and Wildlife Service (USFWS) plans to delist the GYE grizzly bear "distinct population segment" (i.e., remove its 'threatened" status) in 2015 and then do periodic translocations after 2020.

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# The Ocean is Different: Coastal Variability and Limits to Climate Change Detection in Glacier Bay, Alaska

What will I get out of this?

Audience will see that oceanographic parameters can show high inter-annual variability, limiting detection of trend, much less its interpretation. Persistence and patience and are necessary.

**Abstract** 

2015 marks the 23rd consecutive year of oceanographic monitoring of Glacier Bay, a tidewater glacial fjord in southeastern Alaska. The monitoring design combines twice-yearly occupation of 22 permanent stations for monitoring for inter-annual changes and trends, with monthly occupation of eight "core stations" to detect seasonal signals. Surface-to-bottom vertical profiles are obtained for temperature, salinity, density, light penetration, turbidity, dissolved oxygen concentration, and a proxy for phytoplankton abundance. Not surprisingly, there is a strong seasonal pattern of a generally homogeneous, well-mixed water column in winter, and a strongly stratified summertime water column that allows for relatively high levels of primary productivity in surface waters. The extended length of this "spring bloom" in Glacier Bay is notable and is believed to be sustained by regular injection of nutrients to the photic zone from depth via the interaction of tidal currents and bottom topography. The data show high inter-annual variability marked by occasional statistical anomalies (compared to the historical mean of the dataset) for several parameters.

Keywords

oceanography, monitoring, variability

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Coal town to trail town: A grassroots approach to nature based tourism for rural communities

What will I get out of this?

Attendees will understand how to develop a bottom up approach to developing sustainable, long term tourism based on natural resources and protected areas.

**Abstract** 

Many areas of Appalachia have been dominated by extractive industries over the past 100 years. Historically, natural resources have been exploited in a non-sustainable or environmentally destructive way. However, with the decline of many of the extractive industries in Appalachia, there is an opportunity to reinvent communities as providers of natural resources based tourism. This type of tourism includes typical outdoor recreation activities such as hiking and biking, but also encompasses the communities as part of the attraction, thus providing a means to a more sustainable economic future. This presentation will provide several case studies that provide examples of how rural communities, often lacking in financial resources, have a wealth of natural resources to attract tourists. We will explore the importance of a bottom up, grassroots approach to developing tourism in rural communities. The importance of partnerships between communities and protected areas will also be discussed.

Keywords

tourism, engagement, recreation

Lead author / Session organizer

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### E. coli Contamination of the North Fork Virgin River upstream of the Zion Narrows

What will I get out of this?

Will hear of a water contamination problem that is widespread, where the science is very straight-forward, but the solution is complex even with state support.

**Abstract** 

Keywords

and titles of their presentations are given here water quality, Zion

Contamination of the North Fork of the Virgin River with E. coli bacteria has been documented for six years and the state of Utah has listed the reach, including the designated Wild River in Zion National Park, on the 303d list of non-compliant waters. Monitoring by the park and the state has identified the source as irrigation return flows from pastures at the Narrows Trailhead. The case is of special interest to the UDWQ because of the large number of recreational users, the National Park link, and the pervasiveness of livestock grazing along streams in Utah. TMDL planning and remedial actions are currently underway funded by the state, NPS, EPA, NRCS, and BLM, but this is complicated by complex land ownership patterns, and some reluctant landowners. The solution, improved irrigation practices, has the possibility to be a win-win outcome, but may cost more than the value of the livestock raised.

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Implementation of the Zion National Park Water Rights Settlement Agreement, Eighteen years after Adoption

What will I get out of this?

Will provide insights into water rights settlement agreements, how they benefit parks in the protection of water resources and how they can facilitate WSR designation.

**Abstract** 

Zion National Park has numerous springs and perennial streams in an otherwise water-scarce area, so the park's assertion of reserved water rights in the 1980's threatened other water users. The parties involved negotiated the Zion National Park Water Rights Settlement Agreement in 1996. Because the agreement provides limits on water rights and reservoir construction, and not the common standard of injury to water resources, the regular review of water rights changes near the park is a much more streamlined process. NPS staff must assess compliance with the agreement, and not the much more difficult standard of finding significant impact on park resources. The state has also become a partner in protecting the rights of the NPS. A very significant outcome was the designation of 38 river segments as part of the Wild and Scenic River System in 2009. There have been some clarifications and one minor revision to the agreement.

Keywords

Water Rights, Zion

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Establishing a Geospatial Risk-Based Fuels Management Decision Support System for NPS Fire Management

What will I get out of this?

Audience will learn about the lessons learned while developing a geospatially based decision support system for fuel treatment prioritization.

**Abstract** 

The Fire Management Office of the National Park Service, Southeast Region (NPS-SER) is developing a risk-based fuels management program. Lessons learned and results of the geospatial decision support system focused on fuel treatment prioritization will be given. NPS-SER stakeholders developed a matrix of anthropogenic, natural and cultural resources and project management criteria. While the project management criteria is not geospatial in nature all other criteria are. An objective of the decision support system developed is to remove bias with the overall goal of providing the scientific basis to fund treatments that promote resilience landscapes, mitigate hazardous fuel loading, and safeguard communities. While federal budgets are tightening, public and political expectations remain high, this geospatial risk based prioritization decision support system will enable the NPS-SER to apply limited funding in an appropriate manner.

Keywords

Wildland Fire, Geospatial

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# Establishing a Geospatial Risk-Based Fuels Management Decision Support System for NPS Fire Management

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Keywords

Fire, Geospatial

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Ross Meentemeyer, Director, Center for Geospatial Analytics, North Carolina State University, Raleigh North Carolina

### **#SharetheChair: A #RedChair Revolution for Visitor Engagement**

What will I get out of this?

When is a chair more than a chair? When it engages visitors in a conversation and invites them to relax and reflect on their journey.

**Abstract** 

Four years ago, as part of a Visitor Experience Opportunities Workshop, 18 red chairs were placed in the landscape in Gros Morne National Park, Newfoundland and Labrador as a visitor engagement and promotional tool. Visitors were asked to share their pictures, stories, and experiences though various social media platforms. Now, Red Chairs can be found in many Parks Canada sites across the country. When is a chair more than a chair? When it's Red, when it's in an unexpected location, when it engages the visitor in a conversation and invites them to relax and reflect on their journey. Sit back, relax, and join the Red Chair Revolution and find out why visitors love them so much!

Keywords

RedChairs, Visitor, Engagement

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### Speaking with an Authentic Voice: Finding and Sharing Your Story

What will I get out of this?

Storytelling is an integral part of creating memorable visitor experiences and can make strong emotional connections. Sometimes you have to invite other voices in.

**Abstract** 

Many of us have encountered a staff member at a protected site who really connects, makes us think larger about where we are, and leaves us with a greater appreciation of the place we are in. How do they do it? Many times, it's through the power of story. Storytelling is an integral part of creating memorable visitor experiences and done well, creates a stronger, more meaningful relationship between the visitor and the resource. Come experience how one Parks Canada interpreter uses the power of story to weave natural and cultural history into the fabric of every interpretive journey. Sometimes you have to sing your song, sometimes you have to invite other voices in.

Keywords

storytelling, authentic, memorable

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### Tracking non-native plants in the subalpine shrublands of Hawaii national parks

What will I get out of this?

Viewers will learn about non-native plant species monitoring in the under-studied subalpine shrubland habitats of Hawaii Volcanoes and Haleakala national parks

**Abstract** 

Hawaiʻi Volcanoes (HAVO) and Haleakalā (HALE) national parks protect over half of the state's subalpine shrubland, a relatively-intact community that supports numerous native and endemic plants. Though direct human manipulation has been limited, the subalpine shrubland is continually threatened by nonnative plant species that degrade the native habitat. From 2010-2013, the Inventory and Monitoring program monitored 20 transects (5x500m) for non-native plants in the subalpine shrubland of each park. Nearly twice as many non-native species were found at HAVO; however, non-native species frequency was higher at HALE. Hypochoeris radicata was the most common species for both parks. All non-native species encountered at HAVO were herbaceous whereas woody invaders were also documented at HALE. Monitoring at HAVO and HALE is scheduled for every five years. Long term monitoring for non-native species is essential and will allow managers to target invasions at their initial stages, thus reducing future ecological and economical costs.

Keywords

Hawaii, subalpine, plants

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# Weed Prevention: Kickstarting the Weed Free Forage and Mulch Economy in California

What will I get out of this?

Gain a better understanding of the status of certified weed free forage and mulch in California and what hurdles have been surmounted.

**Abstract** 

The Weed Free Forage and Mulch economy involves both agricultural, equestrian, and environmental stakeholders and has historically been a politically charged arena. An interagency group of stakeholders is migrating through the unweildy list of concerns regarding product reliability. After three years of negotiating and keeping the eye on the prize, the program is starting to witness some movement toward the adoption of the national standards for certification and sale (as outlined in the North American Invasive Species Mapping Association). This poster addresses some of the pitfalls, concerns and solutions that have been explored.

Keywords

weeds, forage, mulch

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The Contribution of Indigenous Ecological Knowledge in Management of Enguserosambu Community Forest, Tanzania

What will I get out of this?

Learning stories about local knowledge by the people of Loliondo and how it can shape the current management plans of protected areas in different settings

**Abstract** 

Most protected areas constitute valuable stocks of cultural, social, and natural resources that support livelihoods and well-being of many individuals (Reimerson, 2012), among them are indigenous communities who inhabit vast area of Africa, Asia, America and the Pacific. Enguserosambu community serves as an example for this case. Interviews were conducted in all four villages in an effort to characterize the contribution of indigenous ecological knowledge in management of Enguserosambu Community Forest and surrounding rangelands as well as examine potential barriers to including this information in management activities. Initial findings show that, communities established a board of trustees, a formal local institution to manage the forest on their behalf. Communities still consult and incorporate the knowledge of customary elders in conjunction with the formalized by-laws to protect the forest. The forest ownership provides a positive challenge to communities as their identity is secured and livelihood source protected.

Keywords

Loliondo Forest, Tanzania

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Sharing Circle

Responding to Change: Developing a Network of Preservation Specialists to Address Resource and Staffing Needs

What will I get out of this?

Heritage preservation practitioners and those in related fields will share information on the care of park resources, changing needs, and possibilities for collaboration.

**Abstract** 

Vanishing Treasures Program (VT) staff, and preservation specialists in general, are often the first responders to events impacting our architectural heritage. These events may result from changing climatic conditions, age, neglect, and/or inadequate or inappropriate maintenance. With limited resources available, choosing the appropriate response can be difficult but, at the same time, is critical to resource preservation. This session will challenge participants working in an era of diminishing budgets and restricted travel, to devise ways to create a network of multi-disciplinary preservation specialists, including park and program staff and partners, who can assist with decision making and implementation of response actions.

Keywords

Preservation, Change, Collaboration

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Are grizzly bears more than just scenery? Strategies to improve visitor-based conservation actions

What will I get out of this?

Audience members will learn how to cultivate meaningful wildlife viewing experiences and how to develop sitespecific strategies linking interpretation to pro-conservation behaviors.

**Abstract** 

Wildlife tourism is expected to produce conservation benefits (e.g. donations, volunteering) for popular species. Additionally, animal encounters during a park visit are claimed to stimulate a connection to nature, increase awareness, and create peak experiences. Such encounters are hypothesized to stimulate conservation behaviors within visitors. Animals capable of stimulating public conservation awareness and action are considered flagship species. This study investigated the flagship potential of grizzly bears at Denali National Park & Preserve (Alaska). Data were obtained from 472 visitors at the Wilderness Access Center and analyzed using structural equation models. The viewing experience had a significant influence on visitors' connection to grizzly bears, which in turn was a strong predictor of visitors' pro-conservation behaviors. Data support grizzly bears are an effective flagship species. Denali National Park & Preserve has the opportunity to improve conservation efforts by expanding on-site opportunities for visitor-based actions thereby bolstering wildlife conservation on public lands

Keywords

wildlife, conservation, visitors

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Evaluating use of dendrochronology on Ceanothus verrucosus to inform resource management at Cabrillo National Monument

What will I get out of this?

We used dendrochronology to study growth of a threatened species of shrub, inform management and open avenues to novel research in southern and Baja California

**Abstract** 

The occurrence and timing of wildfire is essential for triggering germination of many fire-adapted native plant species in southern California. Urban development and active fire suppression have isolated coastal reserves from natural fire regimes. Fire-dependent species could become locally extinct if the final seed contribution from a senescing population expires before the next fire. We conducted an extensive demographic study of the Ceanothus verrucosus population at Cabrillo National Monument. Our preliminary investigations reveal that nearly 90% of the population could be approaching senescence. In order to adequately build a population model that accurately depicts life stage distributions, as well as give park managers a timeframe in which to develop alternative management strategies, we used dendrochronology to reconstruct stand ages for this species. Our study also provides a useful tool for quick field assessment of stand age and investigates the possibility of multi-centennial climate reconstructions in southern California and Baja California.

Keywords

fire, dendrochronology, climate

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Cabrillo National Monument

9019
Tabletop – electricity

**Enhancing Your Awareness of Good Lighting Practices Through Illustration and Discussion** 

What will I get out of this?

Audience members deepen their understanding of good lighting practices and factors to consider in specifying outdoor lighting solutions.

**Abstract** 

Public awareness of the need to reduce "light pollution" (e.g., glare, light trespass, sky glow) seems to be at an all-time high, but what this really entails, what the end-product can look like, and how to achieve it is often not understood. Employment of "Good Lighting Practices" goes far beyond simply choosing an energy-efficient bulb or directing light downward. Knowing what is possible through such practices can sometimes only be understood by seeing actual outcomes. This exhibit uses before-and-after photos and documentation of Musco's lighting retrofits of various NPS units over the past decade to help illustrate factors important to specifying any outdoor lighting scenario. Conference attendees are encouraged to ask questions and strive to deepen (or begin) their understanding of these practical lighting principles.

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Stars, Light, Energy

Lead author / Session organizer

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8053 Invited Speakers

### **Navigating NPS Nighttime Resource and Nighttime Recreation Management**

What will I get out of this?

NPS nighttime recreation and resource management provides multi-perspective evaluations on protecting and enjoying parks after dark, and seeks audience input on postulated night research trajectories.

**Abstract** 

Nighttime recreation experiences are increasingly recognized as important components to the enjoyment and preservation of NPS units. Understanding manager, visitor, and gateway perceptions regarding these experiences may help advance nighttime dual-mandate fulfillment. This session presents current NPS management (314 units) perceptions of night recreation/resources, lighting, and factors influencing those perceptions, analyzed by NPS designation. A 3-park study captured visitors' perceptions of nighttime environments and nighttime experience importance, including habituation to light pollution, providing insight into which experiences should be promoted/ managed. Expounding on stargazing quality, visitor-based indicators and standards for night sky observation were formulated over two studies at Acadia NP, providing further implications for night (light) management. However, whose sky standards should we use? NPS, community, and visitor perspectives on night sky management were analyzed with discourse-based research, providing insight to improving communication on management initiatives between such groups. Where should night management and research go from here?

Keywords

pollution, lighting, camping

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Managers' Perceptions of Nighttime Resources and Nighttime Recreation in 314 NPS units: Designation-based analyses
Brandi L. Smith

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NPS Visitiors' Perceptions of Nighttime Park Environments and Importance of Night Recreation Experiences

Brandi L. Smith, Lighting Studies Researcher, Mucso Lighting Company; Good Lighting Practices Fellow, Clemson University

Indicators and Standards of Quality for Night Sky Viewing at Acadia National Park William Valliere, Researcher, University of Vermont

Whose Night Sky? Social Constructions of the National Park Service's Newest Natural Resource

Monika M. Derrien, Graduate Student, University of Vermont

Projected Impacts of Climate Change Mitigation on Recreation Opportunities Across US State Park Systems

What will I get out of this?

Attendees will learn how park managers can best plan for the impacts on operating budgets brought about by the adoption of climate change mitigation policies.

**Abstract** 

This research couples projected changes in economic growth to US states brought about by the adoption of a federal climate change mitigation policy with a longitudinal panel dataset describing the production of outdoor recreation opportunities through the US state park systems. A technical efficiency model and metrics are developed to provide decision makers with evidence of specific areas where operational efficiencies can be improved. The empirical analysis is augmented with simulation-based changes in gross state product to estimate changes to the states' ability to provide outdoor recreation opportunities from 2014-2020; the results reveal substantial variability across states. Finally, two potential solutions for addressing the negative impacts on the park systems' operating budgets brought about by the adoption of a federal climate change mitigation policy are explored; the analyses suggest increasing technical efficiency would be the most viable solution if/when the US adopts a greenhouse gas reduction policy.

Keywords

Climate Change, Economics

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Fire recovery in two Arizona parks and lessons learned through Burned Area Emergency Response Program

What will I get out of this?

This paper provides a comparative analysis of the issues encountered during three years of post-fire recovery in two Southeast Arizona NPS units.

**Abstract** 

In 2011, the Horseshoe II and Monument Fires burned nearly one hundred percent of Chiricahua National Monument and Coronado National Memorial, respectively. With both fires burning at high severity levels across approximately fifty percent of each park's area, there were substantial concerns over post-fire impacts to life, property, and resources. Through the Burned Area Emergency Response (BAER) program, the immediate, emergency impacts were addressed, as well as the chronic, ongoing issues in subsequent years. This paper provides a comparative analysis of the issues encountered during three years of post-fire recovery. Despite occurring nearly simultaneously, separated by less than 100 miles, with similar climate, elevation gradient, and burn severity, the recovery and resource impacts varied considerably between the two units.

Keywords

**Post Fire Recovery** 

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**7897**Café Conversation

How can the National Park Service use healthy outdoor recreation to become relevant to more Americans?

What will I get out of this?

Discuss how the National Park Service can be relevant to new generations and audiences by encouraging outdoor recreation activities that are well-managed, healthy, and fun.

**Abstract** 

The National Park Service has challenged itself to expand and improve its relevancy to the American public in the next century. In this session we will discuss the NPS mission and how recreation opportunities may provide a venue for communicating our mission and engaging a more diverse constituency in our parks and programs. The NPS has already started to revisit the role of recreation in our parks and communities, justified by benefits to physical, mental, spiritual, and social health and as a point of attraction for diverse audiences and new generations. How can the NPS better meet challenges of relevancy through encouraging sustainable and appropriate healthy, active outdoor recreation in our parks and in the communities we assist? Come discuss the role of healthy recreation and healthy communities in the future of protected areas.

Keywords

Recreation, health, relevancy

Lead author / Session organizer

**Jennifer Stein** Outdoor Recreation Planner

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Additional authors / organizers

Stephanie Tepperberg, Alan Turnbull

(De)Colonizing Canadian Cultural Heritage Management: Using Collaborative Geomatics to Empower and Protect Indigenous Cultural Heritage

What will I get out of this?

Attendees will learn how collaborative geomatics programs are redefining how Indigenous communities record, use, and protect their tangible and intangible cultural heritage for conservation.

**Abstract** 

Indigenous communities continue to be underrepresented and disempowered within the Canadian heritage system. Current critical indigenous research calls for further '(de)colonization' of governmental structures to build cultural capacity in Indigenous communities. This presentation provides a critical examination of heritage management practices in Canada and discusses how collaborative geomatics can enhance Indigenous capacity to manage their cultural heritage in a (de)colonized cultural heritage management and planning framework. The research presents a case study of the Dreamcatcher collaborative geomatics program developed by the University of Waterloo's Computer Systems Group, ERS, Centre for Collaborative Mapping, and Mississaugas of the New Credit First Nation. Dreamcatcher is providing community-based programming to map traditional territory, knowledge, and cultural heritage, and is empowering Indigenous communities to manage, control, and protect their traditional cultural heritage. Collaborative community-led programs, like Dreamcatcher, have potential to influence policymakers and to support meaningful, culturally appropriate cultural heritage management for Indigenous communities worldwide.

Keywords

Geomatics, Indigenous, Heritage

Lead author / Session organizer

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Additional authors / organizers

Heather Moran (Comap, University of Waterloo)

Dan McCarthy (Faculty of Environmental Resource Studies and School of Planning, University of Waterloo)

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7734
Panel Discussion

## Return of the Buffalo: A discussion of the impacts of federal buffalo on receiving Tribes

What will I get out of this?

The session will provide an update on current Tribal usage of buffalo acquired from federal facilities and show the positive impacts on Tribal life.

**Abstract** 

ITBC has been assisting Tribes in acquiring buffalo considered "surplus" by federal parks and refuges since 1992. During that time Tribes have incorporated the buffalo into various aspects of their life and this session will show the impacts. Tribes have utilized the buffalo for cultural purposes, for addressing health issues and economic development. Current issues concerning regulations that limit the ability of buffalo to get to Tribes as well as the transfer of live buffalo from Yellowstone National Park will also be discussed. The role Tribes play in federal buffalo management and conservation of the species as well as the future of tribal buffalo management and the inclusion of federal "surplus" buffalo will also be discussed.

Keywords

Tribal, bison

Lead author / Session organizer **Jim Stone** Executive Director

Inter Tribal Buffalo Council jstone@itbcbison.com

Additional authors / organizers

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#### ITBC President, Blackfeet Nation Buffalo Manager

Ervin Carlson

**Executive Director ITBC** 

Jim Stone

**Buffalo Manager, Taos Pueblo** 

Delbert Chisholm

ITBC Representative, Cheyenne and Arapaho Tribe

Chester Whiteman

Buffalo Manager, Standing Rock Sioux Tribe

Mike Faith

Photo monitoring from gigapixel to drone; new techniques showcase change in the Presidio, GGNRA

What will I get out of this?

Audience members will learn fun and compelling new tools and techniques to improve photo-monitoring for many different applications.

**Abstract** 

The Presidio of San Francisco became part of the Golden Gate National Recreation Area in 1994. Since that time, many acres of contaminated Army landfills have been remediated and restored to wetlands, sand dunes, and grasslands which now support thriving populations of five threatened or endangered plant species. Presidio photo monitoring has evolved to document these twenty years of landscape change with the advent of new digital tools and media displays. Drones and robotics now enable land managers to create high resolution imagery at the landscape and micro scale. The presentation will showcase inexpensive hardware and software such as Gigapan and Photosynth and how we have used them to better tell the stories of landscape transformation over the past 20 years.

Keywords	Photo-monitoring, Presidio, Gigapan
Lead author/	Lewis Stringer Supervisory Restoration Ecologist
Session organizer	Presidio Trust lstringer@presidiotrust.gov
Additional	
authors / organizers	
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# Vegetation and soils monitoring in parks of the American Southwest: Synthesis and Lessons Learned

What will I get out of this?

The efficacy of a well-established monitoring protocol to address resource concerns and detect ecological change across Sonoran and Chihuahuan Desert parks will be presented.

**Abstract** 

Initially designed solely to detect long-term directional change to park ecosystems, vegetation and soils monitoring in 18 Sonoran and Chihuahuan desert parks has also been adapted to address emerging, often short-term, resource issues and management actions. The tension between long-term "ecosystem monitoring" and short-term "effectiveness" monitoring in the context of managing southwest parks will be explored, with emphasis on tradeoffs, flexibility vs. consistency, and lessons learned from eight years of monitoring in the "real world". The utility of hybrid approaches and the consequences of evolving designs and refined goals will be discussed using examples from parks in the American Southwest.

Keywords

I&M, vegetation monitoring

Lead author / Session organizer

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Additional authors / organizers

Cheryl McIntyre (Physical Scientist, Chihuahuan Desert Network)

#### Park Break study of vital water resources in Saguaro National Park

What will I get out of this?

Participants will learn about Park Break, a week-long program with graduate students addressing a focused resource issue; and about the dynamics of desert water sources.

**Abstract** 

Park Break is a George Wright Society-USGS program that brings graduate students to parks for studies of important resource issues. In 2014 Saguaro National Park hosted a Park Break focused on bedrock pools in mountain-front drainages, known as tinajas. Tinajas are essential wildlife habitat vulnerable to threats from many sources, yet little is known about their hydrogeology. We summarized more than 10 years of hydrologic data, conducted geologic fieldwork, and used remote sensing to evaluate tinaja characteristics as they relate to watershed variables. Data acquired from our classification scheme and alternative hydrogeologic conceptual models suggests that many perennial and intermittently wet tinajas in fractured crystalline bedrock are hydrologically connected and constitute local-scale fractured rock aquifer systems. In addition to ephemeral surface flow, water comes from storage in sediments and deep fracture systems. Our study has important implications for long-term management and conservation of these unique desert waters.

Keywords

Park Break, hydrology

Lead author / Session organizer

**Don Swann** Biologist

Saguaro National Park Don\_Swann@nps.gov

Additional authors / organizers

Jennifer Aldred – University of North Carolina, Charlotte

Sylvana Bendana – Central Washington University

Alexandra Bijak - University of Virginia

Joshua Conver – NPS, Saguaro National Park

Jesper Devantier – University of Copenhagen (Denmark)

Colleen Filippone - NPS, Intermountain Region

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**7862**Poster

### Climate-Smart Resources Stewardship Strategy?

What will I get out of this?

Share challenges and success stories relevant to creating a "climate-smart" natural and cultural resource stewardship strategy.

**Abstract** 

Share challenges and success stories relevant to creating a "climate-smart" natural and cultural resource stewardship strategy. Address the following topics: (1) deciding on desired future conditions for a "no-analog" future, (2) decision-framing and prioritization platforms given high uncertainty, (3) selecting where, when, and how to intervene, (4) addressing land management unit interests within a broad geographic or regional context; and (5) integrating infrastructure, resource protection, and visitor experience objectives in the process. Present the process and outcomes of the Sequoia and Kings Canyon National Parks Giant Sequoia Pilot Climate Smart Resources Stewardship Strategy.

Keywords

engagement facilitated dialog

Lead author / Session organizer Charisse Sydoriak Division Chief, Resources Management and Science

Sequoia and Kings Canyon National Parks charisse\_sydoriak@nps.gov

Additional authors / organizers

Koren Nydick, Science Coordinator, SEKI

**7859**Poster

How Can We Effectively Talk About and Adapt to Climate Change? Catalyzing Engagement Across Functions

What will I get out of this?

Engage internal stakeholders (employees and co-located partners) in the learning process through facilitated dialog

**Abstract** 

Engage internal stakeholders (employees and co-located partners) in the learning process through facilitated dialog based on plausible future scenarios that could affect how they serve the visitor and perform their jobs. Present a case study poster to describe the "We Are All Stewards" workshops held in Sequoia and Kings Canyon National Parks in 2014 to engage employees from all divisions and partner organizations including the parks concessioners).

Keywords

engagement facilitated dialog

Lead author / Session organizer

**Charisse Sydoriak** Division Chief, Resources Management and Science

Sequoia and Kings Canyon National Parks charisse\_sydoriak@nps.gov

Additional authors / organizers

Koren Nydick, Science Coordinator, SEKI

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### Northern Great Plains plant community responses to nitrogen deposition

What will I get out of this?

Attendees will learn the results of a 4-year field experiment measuring the impacts of atmospheric nitrogen deposition on vegetation in northern Great Plains national parks.

**Abstract** 

Nitrogen fertilization experiments often show increased primary production and decreased biodiversity when this nutrient is added to grasslands. Consequently, the National Park Service is concerned that increasing atmospheric nitrogen deposition caused by fossil fuel combustion could adversely affect the ecosystems in its trust. A 4-year field experiment in three vegetation types of northern Great Plains national parks suggests that plant diversity may decrease with increasing nitrogen in more productive communities, but only at nitrogen addition levels much greater than those expected from atmospheric deposition. Communities with low productivity may be more sensitive. Productivity of badlands sparse vegetation significantly increased with an addition of 10 kg N/ha/yr, a level commensurate with deposition levels anticipated in this region. Inconsistent responses among increasing nitrogen addition levels and years suggest that atmospheric nitrogen deposition effects on many plant communities in this region will be difficult to discern from natural spatial and temporal variability.

Keywords

critical load

Lead author / Session organizer

Amy Symstad Research Ecologist

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Additional authors / organizers

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Wesley Newton, USGS Northern Prairie Wildlife Research Center

Alan Knapp, Graduate Degree Program in Ecology and Department of Biology, Colorado State University

**7923** Panel Discussion

Nature's transformational power: health metrics and measures linked to Healthy Parks Healthy People

What will I get out of this?

This session provides examples and discussion of programs and research demonstrating the transformational power of parks to provide physical and psychological health and wellbeing opportunities.

**Abstract** 

Parks are the predominantly natural places preserved specifically for socio-environmental interactions. These unique places protect rare, sensitive, resources and ecological processes that are vital to our livelihoods, health, and wellbeing. The purpose of this session is to explore the role of parks as health resources, for physical and psychological wellbeing. This session will provide examples of research and programmatic initiatives aimed at promoting resource health and preservation, and human health and wellbeing, as moderated by these natural features. Presenters will describe initiatives to promote health, and research demonstrating the restorative power of nature, followed by an audience and presenter discussion. Participants will gain insight and understanding regarding the power of nature experience ----from the psycho-biophysical benefits of natural soundscapes, to park-based nature contact with youth. Methodologies for advancing Healthy Parks Healthy People-focused research and programs will also be provided.

Keywords

Parks, Health, Wellbeing

Lead author / Session organizer **B. Derrick** Taff Assistant Professor, Recreation, Park, and Tourism Management

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Additional authors / organizers

Diana Allen, Chief, NPS Healthy Parks Healthy People

#### National Park Service Healthy Parks Healthy People Science Plan Overview

Jennifer Thomsen, Postdoctoral Scholar at Stanford University

#### Social Science Examinations of Park Soundscapes: Overview and Lessons Learned

Peter Newman, Dept. Head, Recreation, Park, and Tourism Management, Penn State; Karen Trevino, Chief, NPS Nat. Sounds,

#### The Effects of Natural Sound on Human Cognition and Restoration

Lauren Abbott, Graduate Student, Penn State University

#### Perceptual Studies on the Need for Natural Sound

Jacob Benfield, Assistant Professor, Psychology, Penn State University

#### Parks and Trails Metrics: Supporting Health Promotion

Courtney L. Schultz, Doctoral Student, North Carolina State University

# Project WISE: How a Park-Based Education Program Increases Student Learning and Community Engagement

What will I get out of this?

Learn how a science education program can engage youth, address trends in education and contribute to more engaged communities.

**Abstract** 

Project WISE is a high school environmental science program that serves students largely from communities that have limited access to environmental experiences and careers in science. Every week for an entire school year, Project WISE students take field trips to the Presidio, a national park site in San Francisco. During these trips, students practice science in the form of wildlife studies, water quality testing, and ecosystem monitoring, often contributing to meaningful scientific research. By providing context to the concepts learned in the classroom, Project WISE makes science meaningful and the environment tangible. In addition to practicing science, students also develop skills such as critical thinking and media production, which are needed for successful careers. In this presentation, participants will understand how a park-based science program can address the trends of science education. Additionally, participants will be provided a framework for building partnerships between schools, government agencies, scientists and nonprofit organizations.

Keywords

Youth, Science, Education

Lead author / Session organizer

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Additional authors / organizers

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Guilder Ramirez, Golden Gate National Parks Conservancy

Charity Maybury, Golden Gate National Parks Conservancy

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### Bear Viewing and Visitor Compliance with Park Rules in Yellowstone National Park

What will I get out of this?

Attendees will learn there are significant differences in visitors' willingness to take chances in animal viewing depending on what they believe about how animals behave.

**Abstract** 

The growth and significance of bear management programs in Yellowstone National Park has been carefully documented elsewhere (Gunther 1994), and the success of bear management has also been noted. Grizzly bears especially have increased in numbers over the last twenty years, and are now at the carrying capacity of the park. With that success comes another dilemma for park managers: How to keep human visitors safe. There are now approximately 1,000 bear jams a summer, at which traffic is stopped on roadways. During the summer of 2013, the Office of Bear Manage-ment and Wyoming Survey & Analysis Center conducted a survey of park visitors at animal jam sites. We examine data from 238 interviews of park visitors during the summer 2013. We find significant differences in visitors' willingness to take chances in animal viewing depending upon their particular beliefs about park animal behavior.

Keywords

bears, visitor attitudes

Lead author / Session organizer **Patricia A.** Taylor Professor, Department of Criminal Justice

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Additional authors / organizers

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Burke D. Grandjean, University of Wyoming

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7016	A Flood of Numbers: Monitoring and Data Management
Contributed Papers	
What will I get out of this?	Data, data everywhere, but how do we get a drink out of that firehose? This session offers a range of relevant answers.
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7018	
<b>Contributed Papers</b>	

Assessing Impacts through Better Understanding of Visitors' Knowledge and Attitudes

What will I get out of this?	Managing a park without knowing what your visitors know is like driving blind. This session will inform the audience about a wide range of visitor impacts that affect parks.
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<b>7021</b> Contributed Papers	Climate Change
What will I get out of this?	There's no bigger problem, and it needs to be addressed from every angle in the "hard" and social sciences. This session provides a sampling of current thinking.
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<b>7022</b> Contributed Papers	Cultural Legacies: Case Studies in Continuing Relevance
What will I get out of this?	Listen in as cultural resources professionals explain their perennial challenge to not only preserve the past, but convey its important lessons to new audiences.
Abstract	
Abstract	
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7025
Contributed Papers

## **Economics and Valuation of Parks and Protected Areas**

What will I get out of this?	Despite the centrality of budgets to everything we do, economic analysis doesn't always get the attention it deserves. This session will address that shortcoming by offering a series of engaging case studies.
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t out of this?	The public is a huge potential source of knowledge waiting to be tapped. Hear case studies covering science visitor diversity enhancement, and outreach to the next generation of leaders.
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<b>701</b> 2 Contributed Pape
What will I get out of this

Engagement Leads to Better Management
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"Engagement" is practically becoming a mantra for managers, but what's important is that the effort leads to
measurably better outcomes. This session gives a range of examples.

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	"Engagement" is practically becoming a mantra for managers, but what's important is that the effort leads to
at will I get out of this?	measurably better outcomes. This session gives a range of examples.
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<b>7020</b> Contributed Papers	Historic Structures and Landscapes: Old Problems, New Solutions
What will I get out of this?	Historic structures and landscapes are among the most challenging park resources to take care of. Attendees will discover how cultural resource managers are handling a wide spectrum of problems.
Abstract	
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<b>7019</b> Contributed Papers	Human Impacts on Aquatic Fauna
What will I get out of this?	This set of contributed papers explores a range of human impacts on marine and freshwater species, and offers management solutions.
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<b>7003</b> Contributed Papers	Modeling: Projections, Predictions, and Precautions
What will I get out of this?	Modeling is only going to become more important as social and physical changes affect parks everywhere; case studies illustrates advances and caveats.
Abstract	
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<b>7001</b> Contributed Papers	Monitoring Fire and Managing its Effects
What will I get out of this?	Learn about expanding the use of existing fire monitoring databases, using decision-making tools, postfire effects, and restoration techniques.
Abstract	
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<b>7011</b> Contributed Papers	Monitoring, Managing, and Restoring Vegetation
What will I get out of this?	Vegetation in parks is being heavily impacted by climate change and other stressors. Come hear about how scientists and park managers are responding.
Abstract	
Keywords	
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<b>7013</b> Contributed Papers	Natural Resources Policy on the Frontlines
What will I get out of this?	Policy is the guiding force behind every on-the-ground natural resources management decision. Audience members will leave this session with a better understanding of the connections.
Abstract	
Abstract	
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7014	Natural Sounds and Noise Management
Contributed Papers	
What will I get out of this?	Maintaining natural soundscapes in parks and other protected areas has emerged as a major resource management focus. Catch up with what's going on.
Abstract	
Keywords	
Lead author / Session organizer	TBD
Additional authors / organizers	

<b>7005</b> Contributed Papers	On the Edge of Transformation: Coastal Processes
What will I get out of this?	Learn about how we are moving toward a better understanding of coastal systems, one of Earth's most vulnerable under climate change.
Abstract	
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7024	Partnerships as a Problem-Solving Tool
<b>7024</b> Contributed Papers	raitherships as a Froblem-Solving roof
What will I get out of this?	The audience will discover that the hard work of building partnerships is justified by the practical pay-off in tackling tough issues.
Abstract	
Keywords	
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<b>7027</b> Contributed Papers	Protected Areas as Part of the Larger Social Context
What will I get out of this?	Presentations in this session remind us that parks, protected areas, and cultural sites are social constructs that depend on the continuing support of society as a whole.
Abstract	
Abstract	
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Lead author / Session organizer	TBD
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<b>7008</b> Contributed Papers	Reaching Out to a Diverse World: New Programs, Critical Issues
	Everyone calls for partnerships and outreach, but it's never easy to pull off. Speakers in this session share how they
What will I get out of this?	do it, and what still needs to be done.
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<b>7002</b> Contributed Papers	Responding to Invasive Plant Species
What will I get out of this?	Controlling invasive plant species is among the most difficult problems in resource management; this session will provides examples of new ideas and thinking.
Abstract	
Keywords	
Lead author / Session organizer	TBD
Additional authors / organizers	

<b>7017</b> Contributed Papers	Restoration: The "Long Game" of Protected Area Conservation
What will I get out of this?	Restoration of protected areas will be necessary for a long, long time to come. Vegetation, rivers, old mines, rangelands, wetlands, wilderness—this session has examples from across the board.
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<b>7010</b> Contributed Papers	The Growing Importance of Urban Parks
What will I get out of this?	As large majorities of the world's people migrate to cities, the park professions need to significantly ramp up the focus on urban parks.
Abstract	
Keywords	
Lead author / Session organizer	TBD
Additional authors / organizers	

<b>7007</b> Contributed Papers	The Little (and Often Overlooked) Things that Run the World: Insects
What will I get out of this?	Arguably, the most important animals on the planet are the ones under our feet (or buzzing through the air); this session explains why.
Abstract	
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7006	Widening Challenges to Water Quality
<b>Contributed Papers</b>	
What will I get out of this?	Find out about the expanding range of impacts on water quality that managers are dealing with, from the old (recreational use) to the new (pharmaceuticals).
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<b>7026</b> Contributed Papers	Wildlife Management II
What will I get out of this?	Wildlife is still the centerpiece of the visitor experience in protected natural areas, and is perhaps the most visible
what will I get out of this:	kind of resource management. The second of two sessions' worth of case studies.
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<b>7004</b> Contributed Papers	Wings of Change: Managing Bird Species
	Casa studios provide insights into quien demonstration responses to toxisity, and many
What will I get out of this?	Case studies provide insights into avian demographics, responses to toxicity, and more.
Abstract	
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8073	Gulf Islands National Seashore Youth Ambassadors	
Freestanding —		
What will I get out of this?	GWS Members will meet Youth Ambassadors to learn about student projects, so that they may replicate a Youth Ambassador program at their park or institution.	
Abstract	Youth Ambassadors will speak about the citizen science projects, interpretive programs, and living history events they developed. They will share their experiences and lessons learned with GWS Members. Our goal is to provide the information necessary to duplicate the Youth Ambassador program at other National Park Service sites or Natural/Cultural resource management agencies/organizations.	

Keywords

Lead author / Session organizer

Additional authors / organizers

Citizen Science, Communication,
Susan Teel Chief of Resource Education
Gulf Islands National Seashore susan_teel@nps.gov

Light pollution and sea turtle protection at Gulf Islands National Seashore, a citizen science approach

What will I get out of this?

We discuss a citizen science approach to resource protection and the importance of project development and methodology to ensure scientifically meaningful data collection.

**Abstract** 

Gulf Islands National Seashore contains some of the most unique barrier island ecosystems in the world and provides miles of coastal habitat for wildlife species. The islands support nesting habitat for the federally

threatened Loggerhead sea turtle. The seashore has taken a proactive approach to sea turtle protection with the development of "Turtle T.H.I.S" (Teens Helping in the Seashore), a citizen science project designed to measure and monitor light pollution within sea turtle habitat. This immersive project integrates students, teachers, and the community on a deeper level of stewardship and appreciation of the natural resources protected by the park by bringing these audiences into the park and engaging them in active science. We present the project design and methods used to ensure data collected are scientifically valuable, and discuss the value of community involvement, especially in youth, when addressing the issue of light pollution and sea turtle conservation

Keywords

Stewardship, Wildlife, Conservation

Lead author / Session organizer

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Amber Grove Matt MacGregor

Chad Moore - NPS - Night Skies Program

Mark Nicholas - NPS - Gulf Islands National Seashore

Thomas Stanley - USGS

Jeremy White - NPS - Night Skies Program

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# Yellowstone National Park's Climate Change Program I: Analysis Tools that Prevent Information Overload

What will I get out of this?

The web and desktop-based software that we have created to analyze climate in Yellowstone are freely available and can be used by other parks.

**Abstract** 

Yellowstone has over 70 weather stations that are operated by four different agencies, spread across steep elevation gradients and complex topography. Additionally, gridded (GIS-based) climate data sets offer the somewhat deceptively inviting prospect of complete (no missing value) time series for every month of every year at every location. Each weather station type (COOP, SNOTEL, RAWS, Stream gages, rain gages, etc.) and GIS dataset (PRISM, Topowx, Daymet) offers data in a different, hard to interpret format, and each has its own set of strengths and weaknesses / inaccuracies. We have a developed a set of web and desktop based tools that allow us to sort through hundreds of gigabytes of data in just a few minutes, pulling out the results that are meaningful to resource managers in our area. This talk provides an overview of these tools and describes how they could be applied to other areas of the country.

Keywords

climate change, analysis

Lead author / Session organizer

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Additional authors / organizers

Ann Rodman is branch chief for physical sciences for the National Park Service in Yellowstone National Park.

# Monitoring and Multi-scale Analysis of Dominant Vegetation in National Parks of the Southern Colorado Plateau

What will I get out of this?

We present a framework for incorporating multi-scale ecological drivers into vegetation status and trends monitoring, illustrated for national parks but relevant to other natural areas.

**Abstract** 

We are monitoring the vegetation of predominant park ecosystems to describe status and trends in composition, structure and diversity. We expect the different capacities of plants to match the prevailing environment will result in changing plant assemblages through time. In order to identify and interpret trends, we need to determine what kinds and scales of environmental and historical controls are most relevant. We use a case study of pinyon-juniper woodlands to demonstrate how environmental information at several spatial scales can be compiled to provide local and regional context for vegetation monitoring. By incorporating long-term climate trends, landscape spatial patterns, dominant species distribution patterns, disturbance history, and local physical environments into our analysis, we expect to develop a better understanding of vegetation dynamics. This will help us interpret our relatively short monitoring record, develop hypotheses regarding future change, and understand how local park ecosystems fit into the larger Colorado Plateau landscape.

Keywords

monitoring, vegetation, drivers

Lead author / Session organizer

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Jodi Norris, Quantitative Ecologist, Southern Colorado Plateau Network

Kristin Straka, GIS Specialist, Southern Colorado Plateau Network

# The Revival and Future of the U.S. Biosphere Reserve Program

What will I get out of this?

Gain an understanding of the current status of the U.S. Biosphere Program, learn about recent efforts and challenges, and discuss new future of program.

**Abstract** 

U.S. involvement in UNESCO's international Man and the Biosphere Program has ranged from strong engagement to a long period of inactivity. Recently, there has been an effort to reengage the U.S. in the international network and this presentation will focus on the opportunities and challenges for the United States' involvement and current efforts of the revival effort driven by a recently established group, the U.S. Biosphere Reserve Association. Some of the recent approaches include information sharing with the Biosphere Reserve Information Portal and the Open Parks Network made possible through partnerships with the George Wright Society and Clemson University. These information sharing platforms offer an opportunity for biosphere reserve units and other protected areas to share success stories and challenges to provide broader lessons for protected area management in a variety of contexts. The presentation will conclude with opportunities that can contribute to the revival of the U.S. MAB program.

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biosphere reserve, UNESCO

Lead author / Session organizer **Jennifer Thomsen** Postdoctoral Scholar

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### **Cultural Resources and Climate Change**

What will I get out of this?

Forthcoming

**Abstract** 

In February 2014 NPS Director Jonathan Jarvis issued a Director's Policy Memorandum (14-02) on "Climate Change and Stewardship of Cultural Resources." The memorandum acknowledges that "climate change poses an especially acute problem for managing cultural resources because they are unique and irreplaceable" and that the National Park Service has a leadership role in shaping the nation's strategy for managing the current and predicted affects of climate change on our cultural properties and communities. This session will bring together panelists to discuss issues, strategies, and actions currently underway to address the "three essential questions" identified in the memorandum — adaptation, decision-making, and communication — and provide an opportunity for participants to participate in a robust discussion of next steps.

Keywords

climate change

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Overview of major policy issues

Stephanie Toothman, National Park Service

Policy and decision-making per charettes

Shaun Eyring, National Park Service

Guidance, Secretary's Standards

Brian Goeken, National Park Service

Cultural landscapes management

Bob Page. National Park Service

Climate change and indigenous peoples

Melia Lane-Kamahele

The NPS Cultural Resource Challenge: Preserving America's Shared Heritage in the 21st Century

What will I get out of this?

Audience will get in-depth introduction to CRC and engage in a FAQ and dialogue on how their responsibilities can address and support the CRC goals.

**Abstract** 

In October 2013, the National Park Service issued the Cultural Resource Challenge (CRC), the long-awaited "companion" to the successful Natural Resource Challenge that brought a new vision and resources to the NPS natural resources science and management programs. The CRC responds to more than a decade of reports documenting the challenges facing the NPS stewardship of park resources, as well as those of our partners in the national preservation program. This session is an opportunity to learn more about, and engage in conversations about the Cultural Resource Challenge, progress on addressing the five goals and 2016 budget proposals. NPS Associate Director Stephanie Toothman will present an update on key actions identified for each of the goals - for example the heritage initiatives addressing Goal 3 - "Connect all Americans to their heritage resources..." or the development of the Cultural Resource component of the NPS Climate Change strategy (Goal 4 - Integrate the values of heritage stewardship into major initiatives and issues).

Keywords

cultural resource challenge

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TBD

Stephanie Toothman

TBD

TBD

TBD

TBD

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TBD

# Recent Developments in the Use of Unmanned Aviation Systems for Scientific Research

What will I get out of this?

Explosive growth in interest and a rapidly changing regulatory landscape; substantial uncertainty within the scientific community; benefits, concerns and limitations that must be considered.

**Abstract** 

With the increasing interest in the use of Unmanned Aerial Systems (UAS) in general, many of the federal land management agencies have seen a corresponding increase in requests to use UAS for scientific research on federal lands. The rapidly changing landscape regarding the regulation of the use of UAS has created a good deal of uncertainty within the scientific community. Further, while there are unequivocally myriad benefits to using UAS including the potential for reduced costs, reduced safety risks, reduced natural resource/environmental impacts and increased opportunities for data collection including from more remote places, UAS are not without impacts of their own. This panel session will explore various aspects of UAS for scientific research including: an update on rules, regulations and guidance for UAS use, benefits and concerns, experience and lessons learned from the field, Wilderness areas, and the benefits and limitations of various UAS technologies.

Keywords

**UAS, Unmanned, Aviation** 

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Matthew A. Burgess, Coordinator, UF Unmanned Aircraft Systems Research Program, University of Florida

David M. Bird, Emeritus Professor of Wildlife Biology, Department of Natural Resource Sciences, McGill University

#### Current rules and regulations for UAS use including the DOI/FAA MOU on UAS

James Traub, Aviation Management Specialist, National Park Service (WASO VRP)

Case Studies and Lessons Learned from UAS Missions Flown for Scientific Research

Mike Story, Remote Sensing Specialist, National Park Service (WASO IMD)

The View From Above - The Federal Interagency Roundtable

Bruce Quirk, UAS Liaison, USGS

#### Perspectives on UAS in Wilderness

Guy Adama, Natural Resource Chief, Alaska Regional Office, NPS (invited)

#### Benefits and Limitations of UAS Technology for Scientific Applications

Dr. Benjamin Houmann, Central Michigan University

Developing a citizen science program that supports your park's resource management and monitoring needs

What will I get out of this?

Learn how to design and implement a citizen science program that benefits and supports the resource inventory, monitoring, and research needs of your park.

**Abstract** 

Budget cuts, decreasing staff, and increasing resource management issues are common themes for parks and other protected areas. How do you address these challenges given the limited resources you have available? Part of the answer may be to engage your visitors through a citizen science program that supports your park's resource management needs and issues. This talk will discuss 1) citizen science and its benefits, 2) points to consider when developing a citizen science program, and 3) concrete examples of citizen science projects that support Mammoth Cave National Park's natural and cultural resource needs.

Keywords

citizen science, management

Lead author / Session organizer

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The Natural Neighbors project: Cross-promotion between protected areas and museums and similar institutions

What will I get out of this?

Cross-promotion between protected areas and museums and similar institutions is an effective but underused strategy for encouraging urban people to experience and understand nature.

**Abstract** 

Keywords

museums, protected areas

The Natural Neighbors project is looking at cooperation between protected areas and natural history museums and similar institutions (science centers, zoos, aquariums, botanic gardens, and museums of cities or regions) in encouraging urban people to experience and understand nature. Such cooperation can include exhibits, signs, publications, websites, apps, lectures, and tours. Although there are good examples in the U.S. and abroad, they are the exception rather than the rule. This international project is exploring ways of changing this. It is being conducted by InterEnvironment Institute in cooperation with California conservation agencies and the IUCN World Commission on Protected Areas.

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### Assessing Impacts to Night Skies and the Night Time Photic Environment

What will I get out of this?

Participants will learn a new methodology for assessing impacts to night sky resources, including: quantifying baseline conditions; estimating light emissions; and quantifying changes to baseline

**Abstract** 

Night sky resources and night time photic environments are easily degraded by development outside of park boundaries. Lighting from facilities many miles away can cause a reduction in night sky quality over parks and a degradation of the night time photic environment on which humans and nocturnal wildlife depend. Efforts to protect these resources have been hampered by the lack of a methodology for assess potential impacts from proposed actions. The NPS Natural Sounds and Night Skies Division has developed a methodology for conducting impact analyses for night skies for use in NEPA reviews and other purposes. This presentation will describe this methodology as it was used to assess potential impacts from oil and gas development near Chaco Culture National historic Park. The presentation will focus on data requirements, analytical methods, challenges, and solutions to this approach. Usefulness of the methodology to other types of development will also be discussed.

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Night Skies, NEPA

Lead author / Session organizer Frank Turina Program Manager for Policy, Planning, and Compliance

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# A sustainable winter use plan for Yellowstone? Steps taken to end 17 years of debate

What will I get out of this?

Specific and actionable steps undertaken to resolve this longstanding policy conflict, including the use of strategic communications, new and emerging science, and stakeholder engagement

**Abstract** 

In October of 2013 the National Park Service once again published a final Rule to govern winter use in Yellowstone National Park, one of the most controversial and litigated issues in NPS history. Only this time... there were no lawsuits, no posturing from special interest groups, no scathing letters from elected officials, and no threats of legislation. Instead, only silence, interspersed with favorable press from stakeholders on all sides of the issue. Is it possible that after almost two decades of planning, including seven distinct NEPA processes, ten federal lawsuits, and more than 1.1 million public comments that the Yellowstone winter use policy debate is over? This presentation will focus on the specific and actionable steps undertaken by NPS staff to resolve this longstanding policy conflict, including the use of strategic communication, new and emerging science, and stakeholder engagement, to prepare a sustainable long-term winter use plan for the park.

Keywords

Yellowstone, Winter Use

Lead author / Session organizer Wade Vagias Management Assistant

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Molly Nelson, Engineer

Christina Mills, Planning Assistant

Mike Yochim, Denver Service Center

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**7665**Poster

Who Knows about Parks? Awareness about and Perceived Information Barriers to National Park Identity

What will I get out of this?

This poster focuses on awareness about park designation and information availability, with strong connections to branding initiatives to elevate protected areas' identity on crowded landscapes.

**Abstract** 

Public awareness about parks is lacking across protected area contexts. Although lacking, awareness is important for parks in investing stewards and branding identity as a vital landscape component (e.g., "Find Your Park" initiative). A person's park awareness and perceived park information accessibility may relate to their history (e.g., childhood/repeat/no visits), park proximity (i.e., local/non-local), and racial/ethnic group (i.e., underrepresented populations in park visitation may be less familiar with and have less access to park information). To investigate what may influence awareness and information about parks, we conducted a study using a quantitative questionnaire in five varied, representational national parks and with the New York City population. Responses (n=1480) indicate significant differences in reported awareness levels about and perceived accessibility of information to parks by respondents' history, proximity, and racial/ethnic group. These results have direct implications for management and concepts related to park accessibility and social inclusion.

Keywords

information, branding, awareness

Lead author / Session organizer

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Improving forest restoration techniques at Redwood National Park

What will I get out of this?

We will demonstrate how we are refining (and funding) landscape-level treatments to restore degraded redwood forests.

**Abstract** 

A primary challenge in conserving coastal redwood ecosystems at Redwood National Park (REDW) is the restoration of degraded forests. The need for action is clear; over 65% of coastal redwood forests at REDW have been logged, and typical structure of second-growth stands is not likely to be resilient to disturbances (e.g., fire or drought) and impedes the recovery of old growth conditions. We are testing the effects of landscape-scale forest thinning treatments aimed at promoting the development of old-growth characteristics. Through research and monitoring we are working to improve treatments, seeking to determine what thinning intensities promote optimal growth and how this varies across diverse forest conditions. Currently, we are also exploring the use of prescribed fire as an alternate restoration tool and will present early results from a recent demonstration project. We will discuss innovative funding strategies to pursue this work in an era of declining budgets.

Keywords

forest restoration

Lead author / Session organizer

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Eamon Engber, Fire Ecologist, Redwood National Park, 121200 US Highway 101, Orick, CA 95555.

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### FMH: Long-term fire effects data and research opportunities

What will I get out of this?

We will discuss recent analyses combining data from FMH across multiple national parks, focusing on fuels management and climate change.

**Abstract** 

Beginning in the early 1990s, the National Park Service developed standardized plot-based fire monitoring protocols, which allows direct comparisons of fire effects to be made between and within sites, regions and years. This effort, combined with a separate but similar effort by the US Forest Service, led to the creation of the interagency FFI database (FEAT/FIREMON Integrated, http://frames.nbii.gov/ffi). While these data have been used by federal and some state agencies to describe prescribed fire effects over relatively small management units, we have now compiled these data at a regional scale to address broader questions. Recent and ongoing work focuses on the determinants of fire-caused tree mortality (including climatic influences) and testing the long-term effectiveness of prescribed fire to reduce surface fuels and fire risks. The FFI data have great potential to be put to additional uses, informing basic forest and fire science as well as addressing management concerns.

Keywords

prescribed fire

Lead author / Session organizer Phillip van Mantgem Research Ecologist

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Recreation, values and stewardship: Rethinking why people engage in pro-environmental behaviors in protected areas

What will I get out of this?

Attendees will engage with the value concept and learn about various processes that shape people's decisions to engage in activities that benefit the environment.

**Abstract** 

Stewardship behavior is a centerpiece for effectively maintaining and protecting park resources. Multiple factors such as environmental values affect behavior reported by stakeholders such as outdoor recreationists and are essential for understanding why people do (or do not) opt for minimum impact activities. The speakers in this session will explore a variety of psychological processes that underlie behavior, including "held" values and belief structures that shape behavior and "assigned" values that reflect how people evaluate landscapes. Following a series of presentations, the panelists will engage with members of the audience to further discuss the timely topic of how to sustain the opportunities provided to people by the environment. This session will use the value concept as a vehicle for reviewing select case studies and questioning how managers can incorporate multiple and often competing perspectives into decision-making.

Keywords

Recreation, Wilderness, behavior

Lead author / Session organizer

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Ryan Sharp

Predicting behavioral intentions to comply with recommended Leave No Trace practices
Wade Vagias

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given here

Economics, ecosystem services, and protected areas – monetary and non-monetary perspectives
Ken Bagstad

Pro-sustainable behaviors and loyalty: Exploring factors that influence protected areas and a Zambian tourism market Jane Kwenye

Connecting concepts of place and value: The case of Channel Islands National Park
Carena van Riper

An investigation of value orientations and Leave No Trace behaviors among white water rafters

Ryan Sharp

Heavy Metal Accumulation in Song Sparrows at Tumacacori National Monument on Santa Cruz River, Arizona

What will I get out of this?

Parks and protected areas must recognize that contamination can come from many areas from outside their boundaries.

**Abstract** 

Riparian ecosystems in arid environments provide critical habitat for breeding, migratory, and wintering birds, yet are often at risk of degradation. Birds and wildlife living in parks are susceptible to adverse health effects as a result of long-term exposure and bioaccumulation of heavy metals from outside. We investigated the extent of heavy metal accumulation in blood and feathers of Song Sparrows (Melospiza melodia) over two breeding seasons at Tumacacori National Monument in Arizona's upper Santa Cruz River watershed. Between 5 and 16 metals showed significant differences among sites, although most metals were below background concentrations. Cadmium, copper, mercury, nickel, and selenium in Song Sparrows exceeded background levels found in literature but were lower than earlier studies done prior to the sewage treatment plant upgrade. No major condition effects as a result of metal exposure, yet trends suggest that exposure to higher concentrations induces an immune response through increased leukocyte numbers.

Keywords

TumacacoriNM, contamination, birds.

Lead author / Session organizer

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Prioritizing lightning ignitions at Yosemite National Park with a biophysical and sociopoltically informed tool

What will I get out of this?

This tool can serve as a model for prioritization for other agencies or units that manage lighting fires and can be modified as such.

**Abstract** 

Entering the 2014 fire season, managers in Yosemite National Park had cautious optimism while the rest of California had only an exceptional drought on their minds, coupled with memories of the 2013 Rim fire, there was reason for cautiousness. However, optimism was due, in part, to the park's successful management of lightning ignitions since 1972, including 2012 and 2013 when large fires dotted the state. To identify risks and wildfire potential, Yosemite developed a decision matrix tool based on biophysical conditions, surrounding fuels, and sociopolitical 'situation awareness'. Three zones were identified. High elevation areas presented the greatest opportunity for managing wildfires because they rarely burn in any but the driest years. Middle elevation bands were 'conditional' and would need extra scrutiny, and lower elevation fires would be suppressed. We will present the decision matrix using case studies to validate that there is an appropriate place for managing fires in Yosemite.

Keywords

Yosemite, Fire, Management

Lead author / Session organizer Kent van Wagtendonk Geographer

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Gus Smith is the Fire Ecologist at Yosemite National Park.

# The Impacts of Mountain Biking on Wildlife and People – A Review of the Literature

What will I get out of this?

How to manage bikes in parks, based on the results of the scientific studies (of the effects on erosion, plants, and animals).

**Abstract** 

The sport of mountain biking is expanding rapidly, fueled partly by the mountain bike and tourism industries, the Olympics, and other competitive events (recently, e.g., "adventure racing"). It is putting intense pressure on wildlife habitat, worldwide, as well as inhibiting efforts to protect additional lands. It is important, therefore, to assess its impacts on wildlife, people, and the environment. I reviewed all the available studies, focusing primarily on physics and conservation biology. All of the studies on mountain biking that attempt to compare the impacts of hiking and mountain biking (which address primarily erosion, but also intimidation of wildlife, horses, and other trail users) conclude that their impacts are essentially the same. However, their research designs all have serious flaws: they ignore speed and distance travelled, and nearly all ignore impacts on wildlife; they also make no attempt to test mountain biking under realistic conditions (e.g. normal speeds).

Keywords

mountain biking, wildlife

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9070 Paper	Rim Fire Recovery Update
What will I get out of this?	Learn about Rim Fire suppression repair, Burned Area Emergency Response treatments, hazard tree and salvage operations, restoration, and reforestation.
Abstract	Update on Rim Fire Recovery Efforts since the Rim Fire including suppression repair, Burned Area
Abstract	Emergency Response treatments, hazard tree and salvage operations, restoration, and reforestation.
Keywords	wildfire, recreation
	Dusty Vaughn Recreation Specialist/Public Service Program Leader (Interim
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Transformative and Inclusive: Rethinking Youth Engagement in Nature and Conservation

What will I get out of this?

This discussion proposes to have the audience think deeper and challenge their own assumptions about how to successfully provide meaningful youth engagement opportunities.

**Abstract** 

In recent decades, youth engagement has gained increased attention, becoming a major priority among land management agencies, conservation organizations and nature advocates. However, a disconnection between youth and nature continues to grow. In response, various national initiatives have come to fruition. One of the most recent and overarching of these is the Interior Department's Youth in the Great Outdoors, which aims to "inspire millions of young people to play, learn, serve and work outdoors" and challenges the nation to bridge this growing disconnection by working together to establish meaningful experiences for diverse youth in the outdoors. Using this background as the guiding spirit, our panel of youth engagement experts will discuss best practices on how to provide youth with outdoor experiential opportunities that are transformative, inclusive and relevant to the communities we serve. The audience will be challenged on their assumptions and the current level of engagement their opportunities provide.

Keywords

Youth, Diversity, Community

Lead author / Session organizer Fernando Villalba Natural Resource Specialist

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The Big Picture: Being Inclusive is Being Sustainable

Charles Thomas, PWR Regional Youth Programs Coordinator, National Park Service

Engaging of Urban Youth in Nature and Conservation

Antonio Solorio, Youth Programs Manager, Santa Monica National Recreational Area

Let's get Deep, Let's get Transformative: Meaningful Youth Engagement and Development

Rona Zollinger, PhD, President, New Leaf Collaborative

Where the Youth Meet the Dirt: Transformative and Inclusive Engagement in Practice

Fernando Villalba

**7711**Café Conversation

## **Ecologically Sustainable Recreation in US MPAs: Are We Ready to Ride the Wave?**

What will I get out of this?

This solution-oriented session will craft strategies for engaging growing numbers of MPA visitors in ecologically and culturally sustainable recreation in our most treasured ocean places.

**Abstract** 

Ocean recreation is expanding rapidly, with existing activities growing and new ones emerging everywhere. Increasingly, the nation's marine protected areas (MPAs) are becoming destinations of choice for visitors seeking ocean recreation experiences. Drawn by facilitated access to healthy and diverse ecosystems and by far-reaching public outreach by MPAs and federal tourism initiatives, this rising wave of recreational users poses significant challenges and opportunities to MPA managers. Building upon ideas recently advanced by the MPA Federal Advisory Committee and National Marine Sanctuary Advisory Councils, this Café Conversation will discuss the patterns and implications of this trend and explore management solutions intended to: (i) guide responsible recreation in MPAs; (ii) actively engage MPA visitors as conservation stewards and ambassadors; (iii) forge innovative public-private partnerships to support MPA programs; and, (iv) empower MPA managers with the knowledge and tools to ensure ecologically and culturally sustainable recreation over time.

Keywords

marine protected areas

Lead author / Session organizer

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Gary Davis, Consultant

Data Management: What is it and what can it do for me?

What will I get out of this?

Audience members will learn what data management is, the implications of poor data management, and advantages and techniques for improving data management.

**Abstract** 

In an era of mobile devices, satellite trackers, wildlife cameras, and continuous data collectors, it is easy to acquire immense amounts of data in short periods of time. With this abundance of new technology and data, it is increasingly important for parks to prioritize and invest in data management. Proper data management can greatly reduce program costs by preventing the loss or corruption of data, by utilizing resources more efficiently, and by preventing data redundancy. This presentation will discuss common data management mistakes and highlight practices employed by the NPS Inventory and Monitoring program that could be adopted in any park program.

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Data management

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### Field Stations in National Parks: Opportunities and Challenges

What will I get out of this?

Field Stations offer significant opportunities for science and society, as well as organizational challenges, for sponsoring institutions and the NPS units where they are located.

**Abstract** 

National Park units preserve unique natural and cultural resources. With these resources come opportunities for scientific study. One way to facilitate study is through the operation of permanent research facilities. Enhanced partnerships between field stations and NPS is a recommendation by the National Academy of Sciences. Panelists will explore the concept of field stations located in U.S. national parks run through partnerships with universities and share experiences as managers of those facilities. They will provide examples of projects completed or underway at selected field stations and discuss how projects are mutually beneficial to the educational institution and the NPS unit. Navigating organizational structures can be challenging to both parties. Panelists will discuss specific challenges facing field stations in parks including: handling changes in park and university leadership, conducting manipulative research in areas where the mission of preservation is paramount, and operating under limited term special use agreements.

Keywords

research, partnerships, education

Lead author / Session organizer

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Tom Arsuffi, Director, Llano River Field Station, Texas Tech University

Becca Fenwick, Director, SNRS Yosemite & Sequoia Kings Canyon, UC Merced

Michael T. Stevens, Director, Capitol Reef Field Station, Utah Valley University

### Glacial Velocity as a Predictor of Outburst Flood Hazard at Mount Rainier, WA

What will I get out of this?

Changes in glacial velocity can be used to predict outburst flood potential and the methods can be used for hazard prediction in other glacier-sourced watersheds.

**Abstract** 

Mount Rainier contains more glacier ice than all other Cascade Range volcanoes combined. In the past, glaciers on Mount Rainier have unleashed damaging outburst floods without warning. An empiric link between changing glacial velocities and outburst flood hazard had been previously observed, and 2011 -2012 the surficial velocity field of the lower 1 km2 of the Nisqually Glacier was calculated from repeated measurements of numerous on-glacier sites. During this time, observed velocities in the upper portions of the study area accelerated while the lower portions did not. This is consistent with previous observations of glacier behavior prior to the occurrence of an outburst flood. Shortly after our study concluded, a glacial outburst flood took place. Further monitoring of glacial velocities could provide a predictive methodology for glacial outburst floods in similar terrain. This would enhance employee and visitor safety, along with infrastructure protection at Mount Rainier and in similar dynamic environments.

Keywords

**Glacier, Outburst Floods** 

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Paul Kennard, Mount Rainier National Park

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8085
Invited Speakers

From wilderness to city edge: The role of urban protected areas in metropolitan regions and protected area systems

What will I get out of this?

This Compass Session presents a global to local perspective of the role and growing importance of urban protected areas within metropolitan regions and within protected area systems.

**Abstract** 

This Compass Session presents a global to local perspective of the role and growing importance of urban protected areas within metropolitan regions and within protected area systems. It highlights various aspects of urban protected areas including human health, environmental protection, governance, public policy, changing values, strategic and land use planning, stewardship and partnerships, and changing demographics. This session provides a greater understanding of urban protected areas and offers some best practice guidelines and insights for developing robust, relevant, and accessible protected area systems in metropolitan settings..

Keywords

regional park systems

Lead author / Session organizer

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Additional authors / organizers

Jeff Ward, Manager of Planning, Resource Management & Development, Capital Regional District - Regional Parks

Lynn Wilson, Regional Park Planner, Capital Regional District - Regional Parks

#### Urban protected areas: A global perspective

Ted Trzyna, Chair, Urban Specialist Group, IUCN World Commission on Protected Areas

Near wilderness and its relevancy to our nations' park systems

Mike Walton, Senior Manager, Capital Regional District - Regional Parks

Necessary attributes of local decision-making that achieve positive outcomes for regional nature conservation, citing Lynn Wilson, Park Planner, Capital Regional District - Regional Parks

#### The Bay Area's Protected Lands and Changing Demographics

Annie Burke; Deputy Director, Bay Area Open Space Council

Planning for a System of Regional Protected Areas in the Capital Region of British Columbia

Jeff Ward, Manager Planning, Resource Management and Development, CRD Regional Parks

If this is a session of Invited Speakers

7733
Day-Capper

# The Millennials are Alright: Engaging Youth in Science and Conservation of National Parks

What will I get out of this?

Participants will learn from recent NPS interns and fellows and gain insight into how best to engage young people in resource stewardship.

**Abstract** 

Engaging young adults in science and resource stewardship is a high-priority need of the National Park Service and other land management agencies. Doing so cultivates the next generation of stewards; builds meaningful connections with new demographic groups; and helps meet the needs of protected areas for information, talent, and ideas. How can such programs best be run? In this session, students who have recently participated in NPS internship and fellowship programs will reflect on their experiences and what they think agencies should do to engage their generation. Lively discussion will be prompted by compelling stories, evocative images, and a game show format.

Keywords

Youth, internships, fellowships

Lead author / Session organizer **Tim Watkins** Science & Education Coordinator, Climate Change Response Program

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Additional authors / organizers

Lisa Norby, National Park Service

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7780 Invited Speakers

### The Promise of Protected Areas in an Era of Change

What will I get out of this?

This session will highlight key elements and outcomes from the Responding to Climate Change Stream at the 6th IUCN World Parks Congress in Sydney.

**Abstract** 

Climate change is already significantly impacting natural and cultural systems. Conservation leaders from around the world shared approaches, strategies, and necessary policies for mitigating and adapting to change at the 6th IUCN World Parks Congress in Sydney, Australia. Results from the Congress include the inherent "natural solutions" protected areas possess to abate the effects of climate change, as well as the development of entirely novel adaptation actions that move us beyond current practices to transform our thinking, goals and practices in a fundamentally altered world. Topics also emphasized the critical role of education, effective communication, and community engagement. The session will invite North American national park leaders from the US, Canada, and Mexico to share key outcomes and lessons from the Congress.

Keywords

climate, solutions, resilience

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or a Panel Discussion,

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presentations are

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additional

given here

Stephen Woodley

Key Roles that Parks and Protected Areas Play in a Changing Climate

Leigh Welling, NPS

Ecosystem Carbon Management Experiences Across Global Protected Areas to Reduce Climate Change

Patrick Gonzalez, NPS

Restoring Natural Systems to Provide Resilience to Climate Change

Karen Keenleyside, Parks Canada

Managing for Climate Change in Alaska and the Arctic

Bert Frost, NPS

Best Practices Guidance for Managing Protected Areas Under Climate Change

Stephen Woodley, IUCN

### Beyond Sydney: Achieving Our Goals for the Next Decade of Marine Conservation

What will I get out of this?

Participants will examine recommendations and global, regional and national goals for MPAs, including a community-based approach, and provide practical, grounded advice about moving forward.

**Abstract** 

The ocean makes up 71% of our 'blue planet,' yet less than 1% is fully protected. This issue was a key focus at the 2014 World Parks Congress, featuring a Marine Cross-Cut Theme to address marine and coastal issues across all areas of the Congress. This included a marine component of the "Promise of Sydney" – a collective statement of the milestones and recommendations emerging from the Congress. This session will take a critical look at this "Promise," to identify a path forward to achieve these ambitious goals. We'll discuss the need for a new paradigm, based on a fresh global understanding of and respect for the ocean and the communities that depend upon it. We'll also talk about which of the lessons of Sydney are most relevant to our work, and how we can collaborate to foster more resilient, connected and effective networks of marine and coastal protected areas.

Keywords

MPA, global, WPC

Lead author / Session organizer

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Additional authors / organizers

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given here

Setting the Stage: The Marine Theme at World Parks Congress — Recommendations and Relevance

Lauren Wenzel, National Marine Protected Areas Center

**Reaching Our Goals for Marine Conservation** 

Stephen Woodley, IUCN

**Engaging a New Generation** 

Karen Keenleyside, Parks Canada

MPA Managers' Role in Implementing the Promise of Sydney

Mike Wong, Parks Canada

Safeguarding Our Marine World Heritage

Tim Badman, IUCN

	9000
<b>Panel</b>	Discussion

### Park/Health Partnerships in Practice

What will I get out of this?

Emerging best practices from Bay Area park, health, and community partnerships.

**Abstract** 

his session will delve into practical questions about how park and health professionals can work together on the ground to make their programs a success, and what are the best practices that have emerged so far in the early stages of this movement.

Keywords

Health, Relevancy, Partnership

Lead author / Session organizer **Kristin Wheeler** Program Director

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Mona Koh, Community Relations Manager, East Bay Regional Park District

Jim Wheeler, Recreation Manager, San Francisco Recreation and Park Department

Kristin Wheeler, Program Director, Institute at the Golden Gate

Chris Spence, Director, Institute at the Golden Gate

Rocky intertidal monitoring at Channel Islands National Park responds to challenges of the 21st century

What will I get out of this?

Attendees will benefit from the experience of a legacy monitoring program that is undergoing transformation to meet challenges presented by global climate change and others.

**Abstract** 

As a pilot program in 1982, Rocky Intertidal Community Monitoring at Channel Islands National Park was originally designed to study the effects of visitors at Anacapa Island. The program was expanded to all park islands in recognition of the need to respond to potential oil spills and other environmental perturbations. Results have been used to inform management regarding protection of black abalone and placement of marine protected areas, and will prove invaluable in the event of a catastrophic event such as an oil spill. Current protocols, however, are inadequate to address novel concerns about climate change, disease, ocean acidification, and alien species. At present, the program is undergoing statistical analysis and peer review to evaluate and refine, as needed, sampling techniques and monitoring design to meet these challenges. Preliminary results from the analysis of the 30-year dataset will be presented.

Keywords

Marine, Resource Monitoring

Lead author / Session organizer

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Additional authors / organizers

Pete Raimondi, Professor and Chair, Department of Ecology and Evolutionary Biology, UC Santa Cruz

**7592**Poster

# Determining the temporal distribution of rock climbers using GPS Visitor Tracking

What will I get out of this?

Attendees will learn how GPS Visitor Tracking provides insight into the temporal distributions of visitors as well as management implications from such data.

**Abstract** 

Indian Creek is an international rock climbing destination managed by the BLM near Canyonlands National Park in Southeast Utah. In recent years Indian Creek has experienced high visitation which has brought new management concerns, including ecological impacts and crowding. Identifying where recreationists travel and spend their time can address both of these issues. Therefore, researchers distributed GPS Visitor Tracking units to climbers (N = 159) to help managers identify the temporal distributions of use at Indian Creek within a 24 hour period. This poster will outline the management issues, rationale for the study, methods, analysis, and results. A series of graphs and tables with temporal distributions of use for specific locations within a 24 hour period will be displayed. Emphasis will be placed on the practical management implications of using this technique in diverse protected areas. The poster will also offer methodological recommendations for others interested in GPS Visitor Tracking.

Keywords	

GIS, recreation management

Lead author / Session organizer **Kathryn White** Graduate Student

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Using GPS Visitor Tracking to inform sign placement in high-use recreation areas

What will I get out of this?

Attendees will learn how GPS Visitor Tracking can inform sign placement and content by identifying congestion and confusion areas in high-use protected recreation areas.

**Abstract** 

Indian Creek, an international rock climbing destination managed by the Bureau of Land Management near Canyonlands National Park in Southeast Utah, has experienced high visitor use in recent years along with new management concerns, including ecological impacts and crowding. Therefore, researchers distributed GPS Visitor Tracking units to climbers (N = 159) to help managers identify the travel patterns of recreationists in Indian Creek. Evaluating these travel patterns helped identify key areas of congestion that contribute to social crowding and ecological impacts that may be easily alleviated with proper sign placement and content. This presentation will outline the management issues, methods, and describe how GVT can specifically and easily inform sign placement and content. The presenters will display a series of maps with spatial distributions of use and emphasis will be placed on the practical management implications at Indian Creek and beyond, as well opportunities for future research using GVT methods.

Keywords

GIS, recreation management

Lead author / Session organizer

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Additional authors / organizers

Matthew T.J. Brownlee, Assistant Professor at the University of Utah Department of Parks, Recreation and Tourism

Intelligent Buildings: Lowering Carbon Emissions and Energy Costs through Building Reuse

What will I get out of this?

Reusing buildings produces less GHG than new construction. Their "original design intelligence" combined with new systems can match the energy performance of new construction.

**Abstract** 

Can historic and aging service buildings in National Parks be considered a renewable energy resource for reducing the carbon footprint of the federal government? Can the reuse of federally owned pre-World War II masonry buildings achieve energy efficiencies exceeding those of new construction or be used for mission purposes at less cost than new green construction? The study, Demonstrating the Environmental and Economic Cost Benefits of Reusing Pre- World War II Buildings demonstrates the relative cost, environmental and social benefits of reusing these federal buildings compared to new construction. This data driven research in life cycle assessment and energy savings funded by the Department of Defense was conducted by a team of environmental economists, engineers and cultural resource professionals. The study compares the reuse and operation of pre- World War II masonry buildings with new "green" LEED construction. The results have implications for federal facilities management and cultural sites nationwide.

Keywords

cultural, carbon, energy

Lead author / Session organizer Cherilyn Widell President

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David Shiver, Economist, Bay Area Economics

9007 Poster

### Advances in Research to Support BLM National Conservation Lands in California

What will I get out of this?

1. Introduce the BLM National Conservation Lands and their role in landscape protection. 2. Highlight recent scientific research in California. 3. Identify important science partnerships

**Abstract** 

The Bureau of Land Management's 877 National Conservation Lands (NCL) units distributed across 12 Western states, Maryland, and Florida comprise more than 30 million acres of spectacular landscapes and nationally important cultural and natural resources. California has 185 NCL areas comprising one quarter of all BLM lands in the state. These lands offer exceptional opportunities for scientific research. Scientists in many disciplines are working on NCL lands to support, for example, BLM endangered species management, plant inventories of inaccessible offshore islands and remote wilderness areas, mapping desert soil biotic crusts, and documenting the locations and conservation needs for Native American rock art sites. Increasingly, the BLM is involving citizen scientists and providing training opportunities for young scientists as part of research programs for the NCLs in California.

Keywords

landscape, conservation, research

Lead author / Session organizer

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Additional authors / organizers

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Refugia: Novel roles and concerns for their management

What will I get out of this?

This presentation will help managers understand how refugia may be imporant for conservation with climate change.

**Abstract** 

Baccharis pilularis (Asteraceae, coyote brush), a woody shrub native to California, is invading favored coastal grasslands in central California, including grasslands in Golden Gate National Recreation Area, Muir Woods National Monument, and Mount Tamalpais State Park. In light of expected warmer and drier conditions with climate change, we compared B. pilularis seedling water relations in areas of high fog, cool temperatures and low fog, warm temperatures, with and without neighboring grassland species. There was no difference in how seedlings responded to water deficits as measured by water potential, and seedlings thrived in low-fog, warmer areas. In high-fog, cooler grasslands, B. pilularis seedlings used more fog water when neighboring grassland species were present, indicating seedlings use fog water harvested by neighboring plants. Our results suggest that land managers should actively manage B. pilularis encroachment in order to preserve California's coastal grasslands.

Keywords

refugia, climate change

Lead author / Session organizer

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9060 Business Meeting

### Partners in Amphibian and Reptile Conservation: Round Table Discussion

What will I get out of this?

The PARC round table discussion will allow attendees to find out more about amphibian and reptile conservation and what PARC can do for them.

**Abstract** 

Discussion of PARC initiatives that NPS and the other ten agencies on PARC's Federal Agency Steering Committee (Bureau of Land Management, Department of Defense, Environmental Protection Agency, Farm Service Agency, US Fish and Wildlife Service, US Forest Service, US Geological Survey, National Marine Fisheries Service, Natural Resources Conservation Service, and Animal and Plant Health Inspection Service) will assist attendees in staying / becoming current on amphibian and reptile conservation as coordinated at the federal level. Attendees will also hear about past and current conservation efforts of the greater PARC network, which (in addition to federal agencies) has as its partners: state agencies, researchers, academia, non-governmental organizations, zoos, industry, hobbyists, students, contractors, environmental consultants, etc. - basically, ANYONE with an interest in amphibian and reptile conservation. Participants will also share amphibian and reptile conservation initiatives going on at their site locations

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PARC, herpetofaunal, conservation

Lead author / Session organizer

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NPS Alternate on PARC's Federal Agency Steering Committee; Supervisory Biologist at Rocky Mountain National Park

### Partners in Amphibian and Reptile Conservation (PARC) – An Overview

What will I get out of this?

Audience members will learn about the mission of PARC, as well as the conservation actions, services and products provided by PARC.

**Abstract** 

Partners in Amphibian and Reptile Conservation (PARC) is a network and inclusive partnership of federal agencies, state agencies, non-governmental organizations, researchers, academics, commercial industry (pets, forest products, etc.), and private citizens – anyone with an interest in amphibian and reptile (herpetofaunal) conservation. The mission of PARC is to conserve herpetofauna and their habitats as integral parts of our ecosystem and culture through proactive public and private partnerships. PARC is the largest herpetofaunal conservation effort ever undertaken because PARC works to conserve both amphibians and reptiles, regardless of status, whereas most herpetofaunal conservation efforts focus on one of these vertebrate classes or a specific taxon (e.g., turtles) or only on rare species. This presentation will provide an overview of PARC, including the services and products provided by PARC, and how to benefit from this partnership; as well as a brief overview on the importance of herpetofauna and the threats they face.

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#### Herpetofauna, network

Lead author / Session organizer

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Modeling Recreation: Carrying Capacity & Social Dimensions Explored in the Digital Environment

What will I get out of this?

Learn about recent advances in techniques used to examine site development, visitor use, carrying capacity in parks and outdoor recreation settings.

**Abstract** 

Normative crowding standards of visitors and other stakeholders are increasingly used to measure and manage visitor capacity in parks and outdoor recreation areas. This approach is commonly used in applications of management frameworks such as Limits of Acceptable Change and Visitor Experience and Resource Protection. We extend this framework through spatially explicit and agent based models to examine carrying capacities, visitor experience and crowding, and system dynamics. Modeling tools allow for innovative or controversial management actions and/or site development to be pre-tested for functionality and unintended consequences in a low risk setting.

Keywords

Modeling, Recreation, Carrying-Capacity

Lead author / Session organizer

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Additional authors / organizers

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### Engaging people through climate change science and adaptation in Alaska

What will I get out of this?

The authors will share multiple approaches to communicating with different audiences about climate change and sustainability in Alaska's national parks in a fast-paced presentation.

**Abstract** 

Five years ago, the NPS Alaska Region released a 5-year Regional Climate Change Response Strategy that included as a primary goal to "Increase public and employee awareness and understanding of the causes and effects of climate change, and the measures that will reduce or mitigate these effects." Since that time, climate change has been addressed across parks and programs in multiple ways, including science and natural resource management, engineering and design, sustainable operations, education and interpretive programs and products. NPS has directly engaged the visiting public and local community members and through interpretive programs, demonstrating sustainable practices, experiential learning and public involvement in planning processes. Increasing public and employee awareness benefits learning in both directions, as participants also share their experiences and insights with NPS and other park users. This presentation will include a fast paced overview of program successes and challenges.

Keywords

climate-change, communication, sustainability

Lead author / Session organizer **Robert** Winfree Alaska Regional Science Advisor

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The complex future of parks: effects of climate change on invasive species in protected ecosystems

What will I get out of this?

Audience members will learn about our approaches to science in protected areas, aimed at understanding community responses to global climate change and non-native species invasions.

**Abstract** 

Montane parks and protected areas contain natural gradients that support diversity (e.g., elevation, precipitation, temperature). Under future climate conditions, these gradients are expected to create refugia for 'desirable' biodiversity, but also opportunities for 'undesirable' species that reduce biodiversity. Parks are widely accepted as centers of biodiversity conservation and, thus, offer opportunities to understand the dynamics associated with climate change. Presented are emerging results from several at-risk protected areas, including desert and alpine ecosystems in the United States and Japan. Additionally, the challenges of applying broad science-based management practices to specific parks will be discussed. Overall, our research programs will provide land managers with findings informed by science to develop effective management practices for the long-term preservation of protected areas.

Keywords

plants, invasive, climate

Lead author / Session organizer

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Lara Kueppers, Lawrence Berkeley National Laboratory & Sierra Nevada Research Institute

Travis Huxman, University of California, Irvine

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#### Repairing legacy grazing impacts in Sierra Nevada wetlands

What will I get out of this?

This talk will detail how large scale, science driven restoration has reestablished self-sustaining stable ecosystems that were degrading as a result of historic human impacts.

**Abstract** 

Shepherds and cattlemen intensively grazed wet meadows and fens in the mountains that are now Yosemite and Sequoia and Kings Canyon National Parks from about 1850 to 1900. Many sloping valley meadows in the Sierra Nevada Parks contain unstable, headcutting erosion gullies whose size and rate of expansion indicate a grazing-era origin. No evidence of the prior occurrence of such erosional features exists in the 3-5m deep, ~10,000 year-old accretionary sedimentary record exposed by the gullies. The anthropogenic erosion gullies, once formed, continue to expand, draining the meadow, eliminating wetland plants, and facilitating further erosion in a feedback loop of degradation. The restoration of Halstead Meadow in Sequoia National Park filled in a large erosion gully and reestablished the self-sustaining sheet-flow hydrology and wetland plant community. In flat meadows with no erosion potential, such as Tuolumne Meadows in Yosemite, the historic grazing impacts manifest in plant-soil carbon dynamics.

Keywords

Restoration, wetlands, ecology

Lead author / Session organizer

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Additional authors / organizers

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Athena Demetry, Sequoia and Kings Canyon National Parks

Joel Wagner, National Park Service

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Surviving in a Toxic World: Immediate and long-term management implications for reintroduced California condors

What will I get out of this?

The audience will learn about a high profile, complex endangered species program that uses partnerships, innovative technologies, research, and public outreach to create solutions.

**Abstract** 

After suffering dramatic declines in the wild, California condors (Gymnogyps californianus) were successfully reared in captivity and reintroduced to the wild in the mid-1990s. Pinnacles National Park (PINN) was selected as one of five release sites. Intensive management, juvenile releases, and limited nesting success have increased the total wild population to >230. PINN and project partners manage >60 individuals, which range across 96002 miles of public and private land in central California. However, recovery is seriously hindered by exposure to lead in spent ammunition, which causes poisoning, death, and nest failure. High mortality and small population size necessitate intensive, individual-focused management. With many private and governmental partners, PINN strives to balance urgent species management needs with long-term recovery efforts and research that documents threats and investigates potential solutions. This complex, multi-partner endangered species program is a case study for managing threats that have challenging social aspects and demand creative solutions.

Keywords

endangered, condors, management

Lead author / Session organizer **Rachel Wolstenholme** Condor Program Manager

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Additional authors / organizers

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Denise Louie, Pinnacles National Park

Alacia Welch, Pinnacles National Park

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**7839**Poster

### Citizen Science in Mojave National Preserve

What will I get out of this?

This poster presents creative ways in which a park has engaged the public in resource management and protection, and to increase public awareness.

**Abstract** 

The National Park Service has collaborated with an enthusiastic public to manage and protect the resources of Mojave National Preserve. Volunteers conduct annual springs snapshot surveys, monitor and repair wildlife water sources, collect and maintain data from wildlife cameras. Our volunteers survey over 200 springs, repair and maintain six big game guzzlers, close to 70 small game guzzlers, and numerous spring developments. They have repaired ranching wells for research studies, and assist park staff in organizing an annual youth hunt to draw in the next generation of park stewards.

Keywords

engagement, stewardship, volunteers

Lead author / Session organizer

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Additional authors / organizers

Neal Darby, Mojave National Preserve

#### Mohave tui chub: Where We are 12 Years Later

What will I get out of this?

This presentation discusses efforts to raise the profile of an endangered species, then harness that energy into research, new habitats, populations, public education and awareness.

**Abstract** 

The Mohave tui chub (Siphateles mohavensis bicolor) is an endangered desert fish first listed in 1970. Its sole source population for the species is MC Spring in Mojave National Preserve, plus five transplanted populations at locations throughout the southern California desert, including Lake Tuendae and Morning Star Mine pond in the Preserve. In 2002, the chubs in Lake Tuendae were being threatened with an Asian tapeworm (Bothriocephalus achelognathii) infestation. As a result of a presentation delivered at the 2002 George Wright Conference, substantial progress has been achieved to improve the Mohave tui chub's chances for survival and possible downlisting to threatened. In 2003 Mojave National Preserve hosted a workshop for agency personnel and scientists. Three research studies were completed, and new populations were created at two locations. School programs have been developed to increase public awareness, and additional habitats are being explored for future introductions.

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chub, desert, aquatic

Lead author / Session organizer **Danette Woo** Environmental Compliance Officer

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The implications of conservation policies on mammal diversity within a Costa Rican Biological Corridor

What will I get out of this?

Attendees will learn how international payments for ecosystem services work with private landowners in an attempt to create corridors for wildlife, linking isolated protected areas.

**Abstract** 

Current government payments for ecosystem service (PES) policies, in place in Costa Rica since 1997, strive to protect water, biodiversity, scenic beauty and carbon. PES landholder participants that live in the SINAC (Sistema Nacional de Areas de Conservacion) designated biological corridors are given funding priority because their lands are considered essential for connecting segregated wildlife populations held within the National Parks. The purpose of the study is to assess the ecological function of the Paso de Las Nubes biological corridor. The goal of these biological corridors is to promote conservation of biodiversity and sustainable use of natural resources. We use populations of medium and large mammals as study organisms and indicators of ecological health and movement capability. We will detail diversity held in corridor and buffer regions of the parks, and also provide insight into the efficacy of the policy with regard to the creation of movement corridors.

Keywords

conservation, corridors, biodiversity

Lead author / Session organizer

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Additional authors / organizers

Dr. Thomas E. Lacher Jr.

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# Assessing Biodiversity Outcomes in Protected Areas – what do we really know?

What will I get out of this?

This session brings together the latest research in assessing predictors of success for protected areas in conserving biodiversity outcomes.

**Abstract** 

We have invested globally in protected areas as our key strategy to halt biodiversity loss. However we have done a very poor job at assessing how well protected areas actually conserve biodiversity. What are the best predictors of protected area outcomes, globally and in Canada and the US? What needs to be done to get a better understanding of this critical factor? This session will report on global and national studies that look at biodiversity outcomes with surprising results. It will challenge the session participants to rethink the ways the protected areas are assessed.

Keywords

biodiversity, protected areas

Lead author / Session organizer

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Additional authors / organizers

Introduction to what we know about biodiversity outcome sin protected areas

Stephen Woodley, IUCN

Results of the IUCN Global Assessment on Biodiversity Outcomes in Protected Areas

Ian Craigie, Megan Barnes, Jonas Geldmann and Stephen Woodley

Conservation Gain: Monitoring the state of Parks Canada's National Parks

Stephen McCanny and Dan Kehler

Are US National Parks Effective? When and Why?

Joe DeVivo

8056 Workshop Developing a Collaborative Partnership to Advance US Participation in the World Network of Biosphere Reserves

What will I get out of this?

Workshop organizers will describe the objectives of the Clemson--GWS--Biosphere Reserves partnership, inviting attendees to participate in its implementation through a post-conference working group.

**Abstract** 

Clemson University's (CU) Institute of Parks, GWS and the U.S. Biosphere Reserves Association are developing a partnership to strengthen communication and cooperation among protected areas, and contribute to U.S. participation in the World Network of Biosphere Reserves. This workshop will describe partnership objectives, seek advice from attendees, and invite them to participate in activities by joining a post-conference working group. Project activities include: (1) Development of the CU Open Parks Network (OPN), Biosphere Associates chapter of GWS, and information-sharing features of OPN to facilitate communication among protected areas and conservation professionals; (2) Collaboration with NPS and Peace Corps (PC) in support of PC volunteers working in conservation and protected area fields; (3) Providing cloud-based mapping and analytical services for protected areas; (4) Archiving materials related to the development of the U.S. Biosphere Reserve program; (5) Utilizing OPN's learning portal as a cost-effective strategy for enhancing world-wide training and capacity-building efforts.

Keywords

partnerships, biosphere reserve

Lead author / Session organizer

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Additional authors / organizers

Tom Gilbert, US Biosphere Reserves Association

Elizabeth Baldwin, Clemson University

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additional
speakers/panelists
and titles of their
presentations are
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# A phenological detectability calendar for invasive plant species

What will I get out of this?

We present a useful new tool for planning plant surveys and invasive plant management.

**Abstract** 

Detection is the necessary first step in managing invasive plant species. The detectability of most plant species changes throughout the year with phenological stages. The Invasive Species Early Detection Program of the San Francisco Bay Area National Parks has developed a detectability calendar based on phenological stages of target invasive plant species. Phenophase and detectability by distance class were recorded for each species observed during early detection surveys. Most species had the highest detectability at peak flowering, as is typically assumed. However, some species and life forms were more detectable in fruit, or were equally detectable in senescence. This calendar will be used to predict the best times to search for select species, and can also be used by land managers to plan control efforts when both detectability and phenology are optimal. This calendaring tool can be replicated easily in any region for any set of target plant species.

Keywords

invasive plants

Lead author / Session organizer

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Additional authors / organizers

Robert Steers, San Francisco Bay Area Inventory and Monitoring Program.

Andrea Williams, Marin Municipal Water District.

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# Information Technology Based Wisdom Model of National Park Management

What will I get out of this?

How to use I.T.in wisdom management of national park? how much is the differences between wisdom management and no wisdom management?

**Abstract** 

Wisdom management is the model with the identity of quantity, dynamic, immediate communication based on information technology. Supported by the satellite navigation and modern communication technology, with the system of decision support based on GIS, RS, GPS/CNSS, RFID, EB and VR. This system has an important immediate function that can control rational spatial distribution of visitor flows and reduce crowding or disasters, and also can accurately monitor the change of ecological environment quality continuously, and can forecast disasters, search and first aid treatment, and other immediate treatment. Many indicators of performance have obviously been improved since 2000 in Jiuzhaigou national park based model of wisdom management. The park recreation carrying capacity has increased by 30-40%. The park economic benefits 30-40%. The integrated management efficiency of the park 50-60% and the park community 30-40%. The rate of residents employment reaches more than 95% (1226 residents).

Keywords

Wisdom Technology Management

Lead author / Session organizer

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In 2003, he is a visiting scholar in Utah University, In 2006-2007, he is a visiting scholar in Texas A&M University.

9167 Poster Pathway definition, risk analysis, and risk prioritization at Glen Canyon National Recreation Area

What will I get out of this?

Identifies an approach to characterizing the risk associated with various pathways for the spread of aquatic invasive species and thus prioritizing prevention and containment activities.

**Abstract** 

In late 2012, National Park Service scientists confirmed the presence of a highly invasive aquatic species, quagga mussels (Dreissena rostriformis bugensis), in Lake Powell. In order to inform the planning efforts for a Quagga/Zebra Mussel Management Plan, an interagency working group was formed in late 2013 to provide an objective evaluation of potential pathways and vectors of spread of dreissenid mussels and other AIS relevant to Lake Powell. The outcomes of this analysis show that in consideration of all factors the following pathways are most likely to introduce or spread invasive species.

Keywords

AIS, quagga

Lead author / Session organizer

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Additional authors / organizers

Sandee Dingman, U.S. Forest Service, Boise National Forest Mark Anderson, National Park Service, Glen Canyon National Recreation Area

Summit to Sea: Restoring and Protecting the Aquatic Biodiversity of the National Park System

What will I get out of this?

Will increase the awareness of issues facing the diverse but largely unseen (by visitors) aquatic systems and species managed by the National Park Service.

**Abstract** 

The National Park Service manages diverse aquatic ecosystems that include the waters of two oceans, alpine lakes and everything in between. Many of these unique systems and the species that occupy them have been directly or indirectly impacted by human activities. Biologists and resource specialists in National Parks are working to restore native freshwater and marine species that have been depleted by human harvest, interactions with introduced and invasive species, habitat modification and climate change. Restoration typically requires standardized monitoring and in many cases focused research using cuttingedge methods and technologies. This session in includes a sampling of ongoing recovery and restoration efforts

Keywords

aquatic ecosystem restoration

Lead author / Session organizer **John Wullschleger** Fisheries Program Leader

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The Challenge of Recoverying Mountain Yellow-legged Frogs in Sequoia and Kings Canyon National Parks

Danny M. Boiano and Isaac C. Chellman

The Effectiveness of Marine Protected Areas in Protecting and Promoting Exploited Species

Dave Kushner and Nicholas Shears

The Complex Case of Colorado's Cutthroat: The Greenback Cutthroat Trout in Rocky Mountain National Park

Mary Kay Watry

Eradication of Nonnative Trout and the Response of Threatened Bull Trout at Crater Lake National Park

David Hering & Mark Buktenica

An Overview of Salmon Recovery in the Elwha River Following Dam Removal

Patrick Crain & Sam Brenkman

Summit to Sea: Restoring and Protecting the Aquatic Biodiversity of the National Park System

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Keywords

aquatic ecosystem restoration

Lead author / Session organizer **John Wullschleger** Fisheries Program Leader

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Distinct Native Char Populations of the Elwha River

Patrick Crain

Elwha River Adult Salmonid Migration and Distribution Immediately Following Dam Removal Patrick Crain

The role of science and technology: Perspectives on Pacific Salmon from Olympic National Park

The role of science and technology: Perspectives on Pacific Salmon from Olympic National Park Sam Brenkman

Cost-effective assessment of fish communities using next-generation sequencing of environmental DNA Trey Simmons

Marine Fishing Education for Everyone

Karl Brookins

Calibration performance measures for recreation and sustainable transportation in parks and on public lands

What will I get out of this?

This paper focused on quantitative approaches to integrate recreation context to transportation management, which is crucial for the management of transportation-related recreation behavior in parks.

**Abstract** 

Transportation is integral to public land and park management. In these places, the criteria used to evaluate service quality must reflect travelers' recreation experiences rather than in traditional transportation contexts. Often, planning and managing for the quality of transportation service and travelers' experiences have been independent. However, recent research has begun to describe connections between transportation planning and management focused on system performance and travelers' experience. This work has culminated in conceptual integration between the levels of service (LOS) framework prominent in transportation studies and indicators and standards of quality (I&S) frameworks of recreation and public lands. The study conducts real-time monitoring and calibration for performance of transportation and recreation quality on the Burlington Bike Path, and builds quantitative relationships between LOS and I&S. Study results demonstrate the importance of integrating recreation context into transportation quality management and suggest approaches for calibrating LOS for multiple transportation modes on public lands.

Keywords

Transportation, Recreation, Calibration

Lead author / Session organizer

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# The Role of Transportation in Visiting National Parks by Racial/Ethnic Minorities

What will I get out of this?

This paper focused on perceived barriers and the effect of transportation incentives on increasing park visitation by race/ethnicity, which is meaningful for the NPS.

**Abstract** 

Although the demographic composition of United States is increasingly diverse, racial and ethnic minority groups are underrepresented in visiting national parks. Transportation plays a critical role in providing access to the national parks, but transportation may not be equally accessible to all groups in society. This study examines the role of transportation on visitation rates of three racial and ethnic groups (White, Black, and Hispanic), and the potential impact of transportation incentives on increasing visitation by minority groups through a general population survey of New York City residents. Results from the survey indicate that minorities tend to perceive higher barriers for park visitation than Whites. However, transportation incentives may increase national park visitation by Hispanics. Survey findings support the marginality, subculture, and discrimination hypotheses of constraints on minorities' park and outdoor recreation activities, and suggest effective strategies for park and transportation managers to increase park visitation by minority groups.

Keywords

Barrier, Incentives, Race/ethnicity

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Nathan Reigner, Rubenstein School of Environment and Natural Resources, University of Vermont

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**7612** Freestanding —

# **Cooperative Ecosystem Studies Units Network**

What will I get out of this?

Participants will learn about the opportunities available through the CESU Network for federal agencies and for tribal, university, and nonfederal partners.

**Abstract** 

The Cooperative Ecosystem Studies Units (CESU) Network is a national consortium of federal agencies, tribes, academic institutions, state and local governments, nongovernmental conservation organizations, and other partners working together to support informed public trust resource stewardship. The CESU Network includes 14 federal agencies and 345 nonfederal partners. These partners are organized into 17 university-based Cooperative Ecosystem Studies Units (CESUs) encompassing all 50 states and U.S. territories. The 17 CESUs bring together scientists, resource managers, students, and other conservation professionals, drawing upon expertise from across the biological, physical, social, cultural, and engineering disciplines to conduct collaborative and interdisciplinary applied projects that address natural and cultural heritage resource issues at multiple scales and in an ecosystem context. Since 1999, the CESU Network has supported nearly \$1 billion in research, education, and technical assistance projects, funded through approximately 12,000 projects.

Keywords

research, technical-assistance, education

Lead author / Session organizer

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Additional authors / organizers

Tom Fish

The Many Consequences of Seeing "Nature"

What will I get out of this?

Our topic is the role and impact of nature perception on protected areas. Historians and historical geographers will present the results of original, cutting-edge research.

**Abstract** 

Our session updates attendees on the historical role of cultural perception in the creation, management and support of America's protected areas. Each paper explores how a conception of nature shaped these places. Peter Blodgett begins with an examination of the National Council on Outdoor Recreation's vision for nature recreation during the rapidly changing 1920s. Terence Young then surveys the nationalistic fears that prompted Clinton Clarke and Warren Rogers to initiate the Pacific Crest Trail in the 1930s. Lary Dilsaver continues our western orientation as he illustrates the evolving role that "desert" played in the creation and defense of Joshua Tree NP. Shifting east, Katie Algeo and Collins Eke reveal what became of Mammoth Cave NP's former residents after they were forced out in the 1930s to create "wilderness." Finally, William Tweed revisits the continuing influence of Stephen Mather and Horace Albright's humanistic vision for America's national parks.

Keywords

nature perception, history

Lead author / Session organizer

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Additional authors / organizers

'A Needful Social Force': The National Conference on Outdoor Recreation and Leisure as Nation Building
Peter Blodgett

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are

given here

Renewing Our Faith and Ideals: Christian Nationalism and the Origins of the Pacific Crest Trail
Terence Young

A National Park in the Wasteland: American and NPS Perception of the Desert Lary M. Dilsaver

Where Did All the People Go?: Using Census Data to Track Out-Migration during Park Creation Katie Algeo and Collins Eke

A Long Shadow: The Continuing Influence of Stephen Mather and Horace Albright on the NPS

William C. Tweed