



## Natural Resources and National Parks: A Decade of Accomplishments and Our Complex Challenges Ahead

One hundred years ago, America faced the prospect of dramatic changes to our natural heritage because of the Industrial Revolution and the rush to develop natural resources. America met this challenge by establishing parks, refuges, forests, and other protected areas for the benefit of all citizens. Our forebears also established a new generation of directives to manage federal lands for the protection of irreplaceable resources.

Today, we face a challenge of similar historical significance in the form of global climate change, loss of biodiversity, and habitat fragmentation because of widespread human-induced land and water-use changes. Conservation requires action, and action requires organization. Confronted by a rapidly increasing range of critical resource stewardship issues, the National Park Service must provide both tactical and long-term responses for addressing high-priority park needs.

In the coming decade, we will develop guiding principles and advance stewardship and science to meet the complex challenges we face in retaining the natural legacy that inspired the establishment of national parks over a century ago. With the creation of the Natural Resource Challenge in 1999, the National Park Service heeded the call of resource preservation and restoration through strong, science-based programs. Park managers at many levels have participated to improve natural resource management Servicewide. We have established a vital signs ecological monitoring program for all parks with significant natural resources. Expertise

has increased, and the knowledge of natural resources, ecosystem dynamics, and key species has expanded.

We must continue on the path toward increased knowledge and understanding to confront the challenges now faced by national parks. Park managers must build upon existing decision-making frameworks to include more robust science and increased comprehension of cause and effect relationships confronting heritage resources. The consequences of inaction are as severe as the complex challenges that lie ahead.

The National Park Service recognizes that issues transcend jurisdictions, and natural resource management must move beyond the constraints of political boundaries to consider ecological ranges. With responsibility for so many of America's most treasured landscapes, waters, and wildlife, the National Park Service must increase collaboration with federal agencies, states, tribes, landowners, and other partners to further these priorities. Coordination with broader scientific and environmental communities and international economic



and social institutions must increase, along with transparency and accountability of how management decisions affect ecosystems.

Park managers can transform how the National Park Service conserves nature in the 21st century. Natural resource programs must effectively engage partners and the public. This commitment will ensure that America's natural resources continue to flourish, leaving the nation's natural heritage and legacy intact. Present park managers must lead the National Park Service toward an innovative course of action that builds upon the successes of the Natural Resource Challenge and helps us rise to the challenges of the future as we approach the National Park Service centennial in 2016.

Jonathan B. Jarvis  
Director  
National Park Service

## A Selection of FY 2009 Natural Resource Projects by National Park Service Region

### Alaska Region (AK)

■ New state-of-the-science digital maps were prepared by the region for mean temperature, dew point, and total precipitation for Alaska from 1971 to 2000. Increased spatial detail resulted, enabling highly accurate estimations of point climate values.

■ The Alaska Natural Heritage Program collected and summarized data to display potential bird migration patterns for Alaska's 16 parks. Species with the highest potential of contracting the H5N1 avian influenza virus and bringing it to Alaska were analyzed. Results will increase understanding of how wild birds spread H5N1 across continents.

### Intermountain Region (AZ, CO, MT, NM, OK, TX, UT, WY)

■ The region completed drafts of the Aquatic Invasive Species Management Plan and a more specific Quagga and Zebra Mussels Management Plan. Both mussel species seriously threaten aquatic resources.

■ The Air Resources Program released the final Rocky Mountain Atmospheric Nitrogen (ROMANS) Study to assess the source regions of nitrogen and sulfur that affect deposition and visibility in Rocky Mountain National Park. Links to significant ecosystem changes have been documented as a result. Part of a national effort to apply sound science regarding atmospheric deposition to policy, the study has generated interest among states and stakeholders facing similar issues.

### Midwest Region (AR, IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI)

■ Working with the University of South Dakota, five parks are studying plague, an infectious exotic disease that can be fatal to both humans and wildlife. Although plague had been absent from the parks for years, the urgency of the project was confirmed when the disease was documented at Badlands National Park in 2009. Resulting information will assist in developing management practices to lessen the risk of plague in the parks.

### National Capital Region (DC, MD, VA, WV)

■ Chesapeake and Ohio Canal National Historical Park and the U.S. Fish and Wildlife Service, in cooperation with Allegheny Energy Supply Company, are planning to install fish ladders on two working NPS-owned dams on the Potomac River. These "eelways" could help restore the migrating American eel to its historic range throughout the watershed.

■ Data on more than 2,000 trees were added to a comprehensive tree inventory for the National Mall and Memorial Parks, providing a baseline for a more effective and sustainable urban forest management plan.

### Northeast Region (CT, ME, MA, MD, NH, NJ, NY, PA, RI, VA, VT, WV, DE)

■ The Geologic Resources Program reported on the technological, environmental, and policy aspects of exploring the Marcellus Shale, a vast natural gas resource that, if developed, could affect at least 35 national parks.

■ At Delaware Water Gap National Recreation Area, the Delaware River Sustainability Project is strengthening the capacity of organizations in the upper Delaware River Basin to address development pressures while sustaining ecological, economic, and cultural values critical to environmental quality within the region.

### Pacific West Region (CA, HI, ID, NV, OR, WA, American Samoa, Guam, Saipan)

■ Rapid loss of perennial ice in 80 percent of caves monitored at Lava Beds National Monument threatens 3,300 years of recorded natural history preserved in ice cores. Two cores holding potential information on climate, volcanoes, and vegetation are being preserved and analyzed at Oregon State University.

■ At Mojave National Preserve, 2,828 acres added to the park include 570 acres of designated critical habitat for the desert tortoise, a threatened species faced with high mortality due to habitat loss and direct vehicle impacts.

### Southeast Region (AL, FL, GA, KY, MS, LA, NC, SC, TN, VA, Virgin Islands, Puerto Rico)

■ Barrier island restoration within Gulf Islands National Seashore continued in collaboration with the U.S. Army Corps of Engineers. Through the Mississippi Coastal Improvement Project, specific actions will help restore natural ecological processes and mitigate erosion and land loss caused by frequent intense storms, sea level rise, and a deficit in sediment attributed to dredging sand from navigation channels near the national seashore.

# Rising to the Challenge



BIG HOLE NATIONAL BATTLEFIELD

**Advancing Science in the National Parks**  
The National Park Service has risen to the challenge set forth by Congress in 1999 to improve understanding of park natural resources and strengthen the scientific foundation of resource preservation in national parks. As a result, a distinctive form of stewardship science and science education is emerging that is being applied to management and policy decisions—often on a landscape and ecosystem scale. In addition, park science-based programs increasingly focus on natural and human systems that include both cultural and natural resources.

Integrated approaches for anticipating and responding to complex environmental pressures are an important part of stewardship science. These actions expand management responsibility to collaborate further with communities, outside agencies, and international organizations to achieve a deeper understanding of the nation's long-term needs for protecting its natural assets. Using such effective, efficient, and forward-looking practices, National Park Service science can play a critical role in informing natural resource management beyond park boundaries for this and future generations.



TIMUCUAN ECOLOGICAL AND HISTORIC PRESERVE

**Capturing Kid Power for Conservation**  
An increased emphasis on educational and interpretive components in National Park Service natural resource programs is nurturing new generations of stewards. Outdoor activities like *Timucuan Explorers* (above) introduce urban youth to nature and history as they learn *Leave No Trace* principles. At other parks the *Scout Ranger* program promotes careers in environmental science and conservation, and *BioBlitz* events involve both kids and adults in hands-on park science as they count as many plant and animal species as they can find in a 24-hour period.



CHANNEL ISLANDS NATIONAL PARK

**NRSS Mission Statement**  
The Natural Resource Stewardship and Science (NRSS) Directorate develops, interprets, disseminates, and utilizes the tools of natural and social science and resource management to enable and fulfill the National Park Service core mission: the protection, preservation, and conservation of park resources and values for the enjoyment of present and future generations.

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CATOCTIN MOUNTAIN PARK

**NRSS Purpose Statement**  
The Natural Resource Stewardship and Science Directorate provides:  
(1) National leadership and oversight.  
(2) Centralized, integrated, professional support to parks and the National Park Service.  
(3) Specialized assistance to parks through technical expertise that cannot be efficiently provided elsewhere.  
(4) Facilitation and development of Servicewide approaches that address national-scale issues.



GLACIER BAY NATIONAL PARK AND PRESERVE

**More Information**  
National Park Service  
Natural Resource Stewardship and Science  
1849 C Street NW, Room 3130  
Washington, DC 20240

Go to [www.nature.nps.gov/challenge](http://www.nature.nps.gov/challenge) to view the full-length 2009 *Funding the Natural Resource Challenge Report to Congress*.

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## Natural Resource Stewardship and Science Program Highlights *Fiscal Year 2009*



*"This Action Plan represents our strong commitment to preserving our country's precious natural heritage for this and future generations. . . Preserving our natural resources far into the future now requires active and informed management based on sound science."*

—Robert G. Stanton  
NPS Director, 1999



A Wildlife Health Program is initiated to provide professional veterinary consultation and technical assistance to help parks conserve wildlife.

Sixteen parks receive base increases to fight nonnative species and increase threatened and endangered species recovery.

The Air Quality Program expands to monitor conditions at more national parks. Collaboration with states and tribes begins for improving visibility in national parks and wilderness areas.



The first California condor chick to fledge in the wild since 1982 takes to the skies over Grand Canyon National Park.

National Park Service Director's Order 14, "Resource Damage Assessment and Restoration," is published.



Nine BioBlitzes are offered by the Appalachian Highlands Science Learning Center and numerous partners to assist in national park field research.

The Ocean and Coastal Resources Branch of the Water Resources Program forms to coordinate NPS ocean responsibilities and policies.



After nine years, a captive breeding program for the endangered island fox in Channel Islands National Park ceases due to excellent survival and reproduction rates in the wild.

*"Climate change is potentially the most far-reaching and consequential challenge to our mission than any previously encountered in the entire history of the National Park Service."*

—Jonathan B. Jarvis  
NPS Director, 2009

## Natural Resource Stewardship and Science in the Parks

National Park Service natural resource programs operate on park, regional, network, and Servicewide levels to protect America's most scenic and ecologically diverse lands. The Natural Resource Challenge has improved the capacity of many programs to address complex issues that affect our ability to preserve natural resources unimpaired as mandated by the 1916 Organic Act. Funding increases approved by Congress from fiscal years 2000 through 2007 totaled almost \$78 million to expand natural resource research, restoration, education, and leadership in many national parks.

**Park and Regional Natural Resource Programs**—The Challenge provided base increases to 36 parks for basic natural resource activities in small parks, invasive species control, threatened and endangered species recovery, and native species efforts. These parks continue to benefit from Challenge funding today with an increased capacity for addressing threats to natural resources. Regional programs also benefited from the Natural Resource Challenge, which provided funding to establish specialist positions with focused knowledge and skills to assist multiple parks with resource management issues.

**Servicewide Natural Resource Programs**—Broad-based programs offer policy and regulatory expertise, provide technical assistance and advice, help develop plans and proposals, and guide education and outreach. The Challenge enhanced these Servicewide efforts by strengthening four basic program areas: Air Quality, Biological Resource Management, Geologic Resources, and Water Resources. In addition, the Environmental Quality, Natural Sounds, and Social Sciences programs provide expertise and direct assistance to national parks. The Climate Change Response Program provides Servicewide leadership for climate change issues, while the Resource Protection Program offers project funding for resources at risk.

**Network Programs**—Four Challenge-funded programs link parks into biogeographic networks across the country: Cooperative Ecosystem Studies Units, Exotic Plant Management Teams, Inventory and Monitoring Networks, and Research Learning Centers. These network programs allow parks to accomplish much more together than they could individually, in a cost-effective manner, by consolidating efforts and leveraging limited funding with partners.

**Natural Resource Preservation Program**—Funding for this program enables parks to undertake natural resource management projects beyond the scope of park budgets. It supports diverse activities in areas like wildlife, fisheries, and vegetation management; specialized inventories; planning; mitigation actions; and restoration.

The first National Park Service Comprehensive Survey of the American Public is completed to provide information on both park visitors and non-visitors.

The first Oil and Gas Management Plan helps guide decision making for nonfederal oil and gas operations in national parks.



Rapid response Exotic Plant Management Teams are established to help parks control invasive plant species.

Sixteen field-based aquatic resource specialists are funded to provide parks expertise in fisheries biology, marine and freshwater ecology, and hydrology.

An Alaska special projects category is established to fund activities that protect and manage Alaska's natural resources.

New and historic photographs at Lake Clark National Park and Preserve document retreating glaciers.



A new protocol is developed for constructing wildland fuel load maps to help minimize wildfire risk to people living within and next to parks.

The Natural Sounds Program assists 39 parks with acoustic data collection and analysis, monitoring, and planning to develop plans for mitigating noise impacts.

A climate change coordinator position is established to foster communication and define strategies and actions for addressing this critical issue.

Great Sand Dunes National Park and Preserve receives a water right decree that protects groundwater within the park.



A multiagency reef fish monitoring protocol published for the Florida Keys Coral Reef Ecosystem provides regional data extending to Dry Tortugas National Park.

National Park Service Director Robert G. Stanton launches the Natural Resource Challenge to create an expanding source of scientific knowledge and information.

Congress authorizes the first Natural Resource Challenge funding increases. National Park Service sites are organized into 32 Inventory and Monitoring Networks, linking 270 parks with significant natural resources by ecoregion.

The first Cooperative Ecosystem Studies Units and Research Learning Centers facilitate cutting-edge research in national parks.

Twenty additional national park units receive base increases through Natural Resource Challenge funding.

The Natural Resource Condition Assessment Program begins to assess existing conditions for ecological resources in national parks.

Funding increases support 22 of 32 Inventory and Monitoring Networks to initiate long-term park vital signs monitoring. Together these 22 networks represent 76 percent of parks with significant natural resources.

The Gulf Coast Network acquires new imagery and lidar (light distance and ranging) data shortly after Hurricane Katrina for use in natural resource studies and to plan reconstruction of park infrastructure.

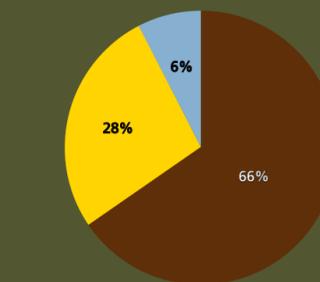
Working with state and federal partners, the National Park Service begins adaptive management of marine reserves in four ocean parks to restore the integrity, stability, and beauty of depleted ocean park resources.

Quagga mussels, a close relative of the zebra mussel and an exotic species, are discovered in Lake Mead, the first detection of this species in the western U.S., leading to an immediate response by the National Park Service.

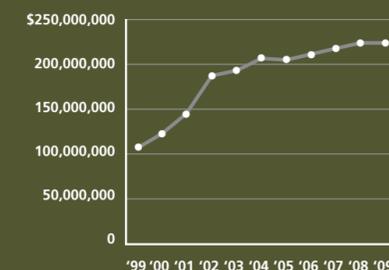
A new Human Dimensions Program is initiated to provide Servicewide policy guidance, technical assistance, and consultation for integrating social science into biological decision making.

The Climate Change Response Program is established to provide guidance, scientific information, and recommendations for protecting our natural and cultural heritage from the detrimental impacts of global climate change.

Natural Resource Challenge Program Funding Increases by Emphasis Area



Natural Resource Stewardship and Science Program Total Funding



1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

2009