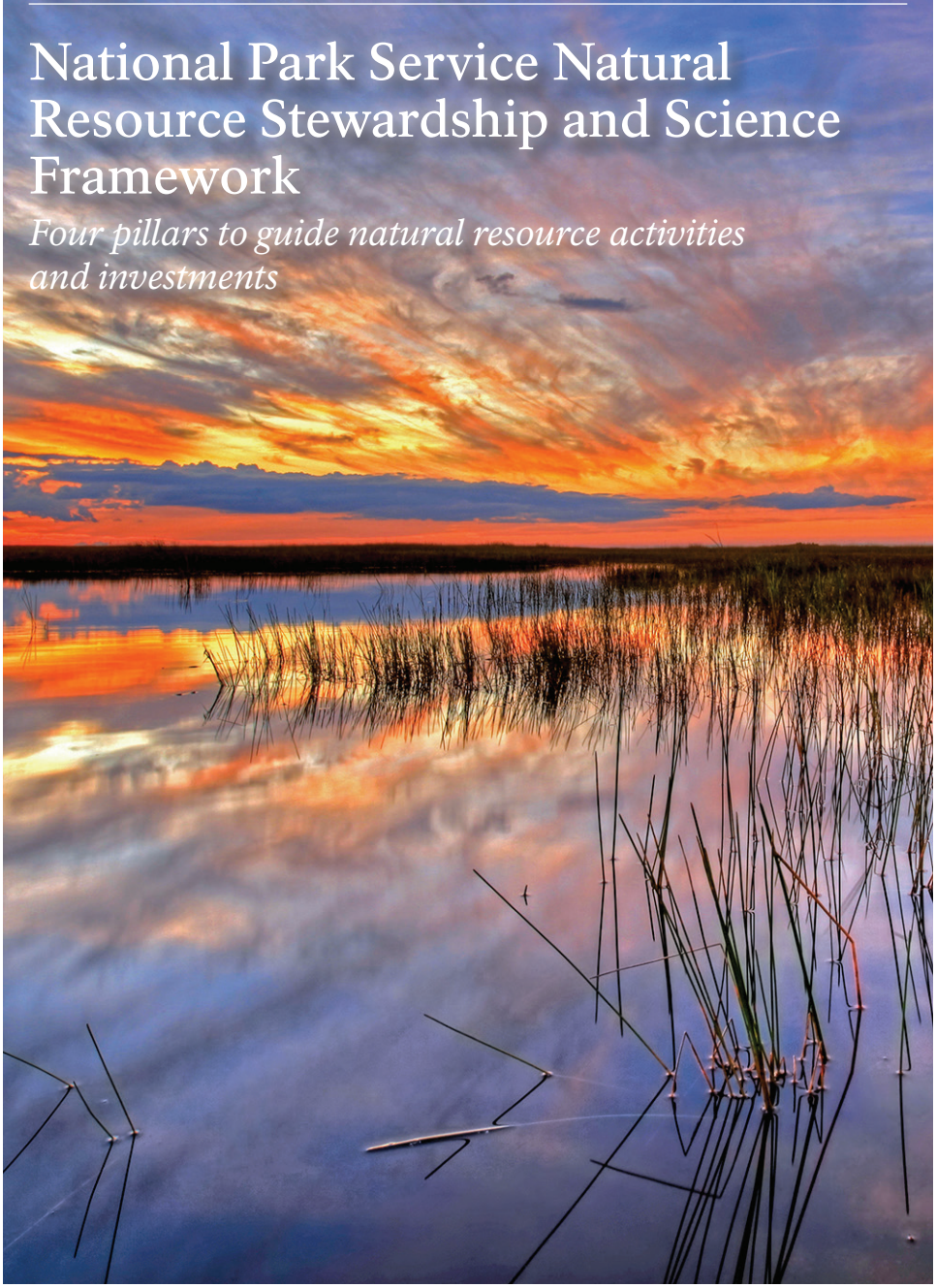
National Park Service
U.S. Department of the Interior

Natural Resource Advisory Group
Natural Resource Stewardship and Science

National Park Service Natural Resource Stewardship and Science Framework

Four pillars to guide natural resource activities and investments



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Four pillars to guide natural resource activities and investments

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Washington, D.C.

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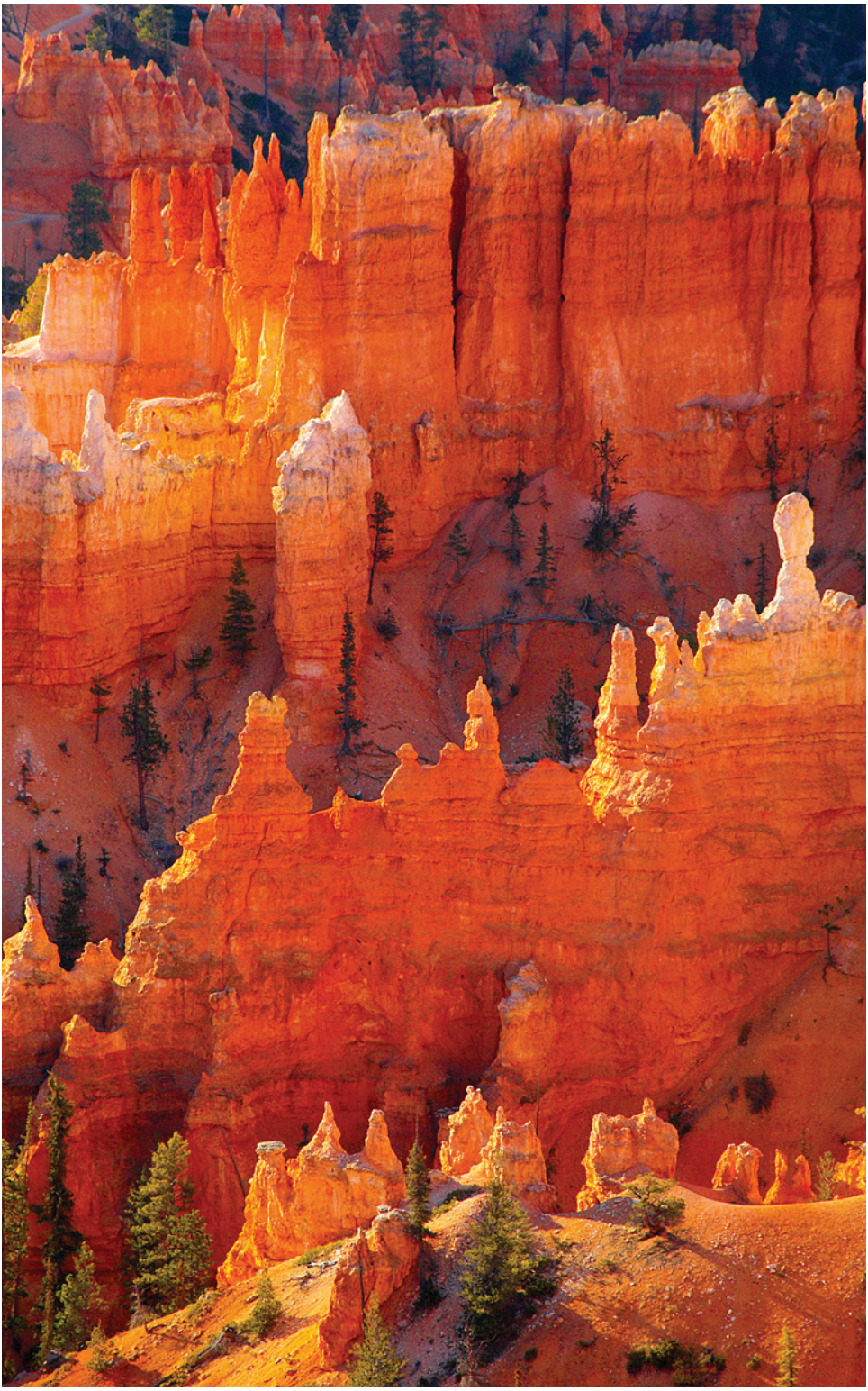

Preface

On behalf of the National Park Service (NPS) Natural Resource Advisory Group (NRAG) and Natural Resource Stewardship and Science Directorate (NRSS), I am pleased to offer this *National Park Service Natural Resource Stewardship and Science Framework*. The framework offers a forward-thinking rationale around which natural resource priorities and investments can be articulated, and provides a basis for current and future strategies. The framework recognizes actions that "hold the line"—those day-to-day natural resource activities in parks that managers must attend to—while embracing the need to equip and position the NPS for an increasingly complex and dynamic future. The framework identifies four pillars that guide the NPS to adapt and respond to continuous change, with a focus on long-term ecological integrity and viability:

- Holding the Line
- Managing amid Continuous Change
- Leveraging for Conservation at Scale
- Enhancing Stewardship and Science Access and Engagement

The framework was developed by a work group tasked by NRAG, with subsequent review and input by the full NRAG membership and senior leaders within NRSS. The document was then distributed to and reviewed by the NPS National Leadership Council. The framework is intended to be a living document that will be revisited by NRAG, NRSS, and other stakeholders, and its review will be included as a standing agenda item at the annual face-to-face meetings for NRAG.

Please join me in using the framework for guidance and insights into the broad goals of resource management, priorities for natural resource stewardship and science in the National Park System, and useful actions and activities that can be implemented to achieve these goals.

Raymond M. Sauvajot
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Introduction

The National Park System is a covenant with future generations. Conservation and protection of natural resources in the National Park System and through the work of the National Park Service is about more than air and water, iconic vistas and features, ecological processes, and species—it also is about our quality of life and that critical intersection we share with the natural environment. Natural resource stewardship imparts tremendous environmental, recreational, cultural, social, and economic values and opportunities for the American people.

Natural resource stewardship in the NPS must be strategic, interconnected, science-based, and inclusive. The NPS faces numerous natural resource-related challenges. We can proactively tackle these challenges by moving forward with a clear vision, thoughtful planning, and collaborative implementation of goals, strategies, and programs.

The Natural Resource Stewardship and Science Directorate of the NPS, in collaboration with NPS regions, parks, and programs, provides Servicewide natural resource leadership and support through coordinated and strategic approaches, grounded in a conservation ethic of science, critical analysis, knowledge synthesis, and informed decision making. Together this work contributes to the integrity of park resources and the conservation of our natural heritage for present and future generations to enjoy. To improve our ability to advance natural resource stewardship and science for the NPS, this *National Park Service Natural Resource Stewardship and Science Framework* offers a

forward-thinking and organized rationale around which natural resource priorities and investments can be articulated, and provides a base for current and future strategies. This framework recognizes the need for actions that "hold the line"—those day-to-day natural resource activities in parks that managers must attend to—while embracing key requirements to equip and position the NPS for an increasingly complex and dynamic future.

The Framework

For the NPS to succeed in the cooperative, long-term stewardship of our nation's natural heritage, a collective strategy is both necessary and important. This framework outlines such a strategy by offering a comprehensive, broadly applicable, and flexible course for the future. The framework calls for tackling complex natural resource challenges by working with collaborative partnerships, communities, and all types of government agencies. Achieving new conservation advances while simultaneously ensuring resiliency of our past investments requires cooperative conservation involving the NPS, the Department of the Interior, local, state, and federal agencies, and other organizations and stakeholders. Engagement and collaboration are necessary across the entire community of government, conservation, nonprofit, private, scientific, and academic partners to ensure success. This framework is inclusive and flexible, and designed to engage all sectors of NPS and partners in a commitment to collaborate across the organization in the stewardship of shared natural resource values. It is not intended to be prescriptive.

This framework identifies broad priorities and focus areas for NPS investments and activities in natural resource stewardship and science that can be managed toward clear outcomes and evaluated for progress, effectiveness, and efficiencies. A major focus for the NPS is management of park natural resources across the system on a day-to-day basis. This daily management or "holding the line" will always be core to the NPS. Long-term success means both focusing on day-to-day needs and investing in stewardship and science in dynamic critical areas to ensure

the NPS is managing for change, leveraging conservation at scale, and enhancing science, stewardship, and engagement. This combination of priorities reflects the perspective around which this framework is organized and the four foundational pillars described below.

Four Pillars of Natural Resource Stewardship and Science

Four pillars that support a science-based foundation for the NPS in the 21st century equip the NPS to adapt and respond to continuous change, and focus on long-term ecological integrity and viability in a dynamic and challenging future:

- Holding the Line
- Managing amid Continuous Change
- Leveraging for Conservation at Scale
- Enhancing Stewardship and Science Access and Engagement

The pillars emphasize collaboration, cross-discipline learning, and synthesis; elevate scientific integrity; encourage a strong role for science in informing park management; and emphasize the value and need of law and development of policy guidance.

Portraying natural resource stewardship and science priorities around the pillars:

- Provides internal strategic guidance for NRSS in collaboration with regional offices, parks, and other NPS programs

- Promotes shared understanding about the priorities and focus of the NRSS Directorate, regional offices, parks, and other NPS programs, both internally and externally and provides a nexus for our collaborative efforts

- Enables the NPS and NRSS to respond to various reporting requests, congressional and departmental inquiries, as well as engage in various funding or collaborative opportunities and initiatives in a consistent and organized manner

- Articulates focused attention on key areas of interest for the NPS while accommodating flexibility amid changing fiscal, political, social, and ecological environments

The four pillars and associated focus areas were identified through a facilitated process that involved a work group tasked by the NPS Natural Resource Advisory Group (NRAG), with subsequent review and input by the full NRAG membership and senior leaders within NRSS. The pillars reflect consideration of NPS operations and needs while also recognizing the importance of positioning the agency's conservation leadership at national and global levels. This framework expresses tangible, concrete ways for the NPS to work together to transform natural resource management for a future that is different from our past. It includes new ideas and expands on successful ideas that are established and field-tested. This framework offers guidance and insights into the broader goals of resource management, priorities for natural resource stewardship and science in the National Park System, and what policies and actions may be necessary to achieve these goals. It also creates a basis for NPS natural resource managers to inform policy, planning, and management decisions. It ultimately helps advance the NPS as a leader in addressing conservation and resource stewardship opportunities for parks and protected areas of our nation and around the world.

Each pillar is framed with several focus areas to provide further guidance and clarity. Examples within the focus areas are not meant to be prescriptive or comprehensive. Examples are offered as tangible illustrations of the types of activities that align with each focus area.

1. Holding the Line

Many national park units are located in human-dominated landscapes and/or experience extensive visitation and types of visitor use. For many parks, a significant management priority and challenge is day-to-day natural resource management, and the conservation, restoration, and preservation of the condition of the park's natural resources. Managing for the "here and now" will always be critical for parks and programs, whether it is ensuring that resource values are maintained during high visitation periods, during extreme weather events, amid conflicts among user groups, or with year-round routine operations. In many cases, this day-to-day management entails restoring park habitats altered by current or past practices in or outside parks.

Focus Areas

- ***Conserve and Restore Biodiversity and Ecosystem Integrity***

  Examples may include:

  - Removing barriers to ecosystem recovery, such as earthen dams, unused or recently closed roads, and nonnative invasive vegetation
  - Restoring at-risk or extirpated native species and their habitats
  - Offering technical assistance, developing policy, and interpreting legal and policy positions for complex or precedent-setting restoration, ecosystem integrity, and biodiversity challenges

- ***Address Human Activities Within and Adjacent to Parks that Affect Natural Resources***

  Examples may include:

  - Evaluating and mitigating impacts to park natural resources from management actions and park visitation

  - Conducting analyses and framing responses to other agencies for actions and proposals that may impact park resources, including outside of park boundaries

  - Facilitating and applying consistent natural resource and environmental law and policy development and interpretation between and across NPS units and programs

- ***Understand and Develop Capacity for Maintaining and Improving Ecosystem Processes and Character across the System***

  Examples may include:

  - Developing, implementing, and offering training and expertise about environmental compliance, planning, and permitting to ensure natural resource values are considered and protected

  - Providing tools, training, and standards to maintain or restore viewsheds, air quality, natural sounds, and night sky qualities

  - Prioritizing and implementing inventory and monitoring activities using standardized and consistent state-of-the-art protocols

2. Managing amid Continuous Change

Managing within an unfolding, dynamic, and challenging future will require the NPS to understand and proactively integrate and reconcile continuous change with overarching objectives for sustaining resource integrity, authenticity, and role in transformative visitor experiences. This pillar articulates those activities that focus on managing for the future in the context of change.

Focus Areas

- ***Promote Restoration that Builds Long-term Adaptive Capacity***

  Examples may include:

  - Restoring riparian, fresh, estuarine, and saltwater wetlands as an adaptation strategy for increasing precipitation volatility
  - Recovering keystone species that have a disproportionate effect on ecosystem function
  - Identifying and reducing stressors to ecosystem integrity and resilience, such as implementing early detection and rapid response in controlling or eradicating nonnative species
  - Building tools to share data, methods, and metrics across the NPS and with appropriate partners to help measure restoration effectiveness

- ***Understand and Develop Mitigation Measures for Resolving Stressors Related to Land-Use Change***

  Examples may include:

  - Evaluating the effects of energy development on viewsheds and air pollution in parks
  - Monitoring and analyzing the effects of urbanization and other developments on park groundwater quality and availability
  - Recognizing and developing mitigation measures to reduce impacts of landscape fragmentation on the ability for species to disperse, migrate, or persist

- ***Plan for and Respond to Climate Change***

  Examples may include:

  - Evaluating and planning for the consequences of sea level rise on park resources and facilities
  - Understanding resiliency and the role of intact native ecosystems when planning for and adapting to a changing climate
  - Investigating range shifts of wildlife and habitats due to a changing climate
  - Providing tools and considerations for park managers when addressing flora and fauna adaptability as habitats and ranges shift

- ***Anticipate and Address Emerging Issues***

  Examples may include:

  - Conducting risk assessment, containment, and prevention of future exotic species in the aquatic, terrestrial, and marine environments to prevent emergences of invasive exotic species

  - Projecting future exotic disease and pathogen threats to ecosystem integrity

  - Providing tools to park managers to address offshore wind energy impacts in a consistent manner across the NPS (e.g., noise, fragmentation of marine biological corridors, viewsheds)

- ***Understand and Respond to Changing Socioeconomic Characteristics and Cultural Values that are Relevant to the NPS Mission***

  Examples may include:

  - Implementing socioeconomic monitoring and facilitating application of appropriate adaptive responses in parks based on monitoring results

  - Developing civic engagement toolkits that complement NEPA planning

  - Understanding the connections between an increasingly urban populace, urban parks, and NPS programs in broadening the relevance of natural resource stewardship opportunities

3. Leveraging for Conservation at Scale

Large landscape conservation is critical to the protection of natural resources in parks. National Park System units are becoming increasingly isolated and fragmented as other human uses of the landscapes containing the parks grow. Long-term conservation of park resources requires working successfully beyond the boundaries of any individual park or protected area, and with an array of partners to advance protection of the full breadth of resources and special areas under the NPS umbrella. Conservation at scale necessitates planning for biologically connected networks of lands, waters, air quality, and other resources, and for encouraging collaborative communities of people and ideals. It requires partnerships across governmental, public-private, and international boundaries. Working at scale includes spatial extent, time-scale, social and economic context and system level considerations: placing local issues in the context of larger systems to fully leverage the National Park Service as a contributor to sustainable development of those larger systems.

Focus Areas

- ***Promote Stewardship and Science at Landscape, Seascape, and Viewshed Scales***

  Examples may include:

  - Providing policy guidance and resource management tools to scale up resource stewardship efforts to the landscape level

- Institutionalizing NPS efforts to engage at the large landscape level such as promoting cooperative establishment and maintenance of plant and animal movement corridors and connectivity, or restoring night sky vistas through partnerships and collaborative agreements

- Working across international boundaries on shared resource management issues, such as water or air quality along the borders of Canada or Mexico, migratory species conservation, and management of marine resources

- ***Establish and Enhance Partnerships and Relationships***

  Examples may include:

  - Leveraging funding or other resources for collective science knowledge

  - Maintaining and expanding on-the-ground large landscape partnerships such as Landscape Conservation Cooperatives, Joint Ventures, and Biosphere Reserves and engagement in the Land and Water Conservation Fund prioritization process

  - Leveraging science capacity at broad scales with programs such as Research Learning Centers, Cooperative Ecosystem Studies Units, Climate Science Centers, and other academic, nonprofit, and private entities

- ***Promote Cooperative Approaches to Management and Mitigation Activities Within the Context of Large Landscapes, Seascapes, and Viewsheds***

  Examples may include:

  - Engaging with surrounding landowners and other stakeholders to include consideration of park protection needs in land use plans, marine conservation strategies, and other resource management plans

  - Assisting parks, regions, and NPS programs in the use of landscape-level mitigation actions

  - Developing guidance for landscape-scale cooperative conservation agreements with other agencies and organizations

4. Enhancing Stewardship and Science Access and Engagement

The NPS is expected to utilize the latest scientific information in all of its natural resource management decisions. For science to become usable knowledge, its reach and application must extend beyond peer-reviewed publications, although these are important. Facilitating the understanding of the value of science and ensuring that science outcomes are accessible and easily understood, internally and externally, is fundamental to the success of applying science to resource management decision making and action. To do this requires acquiring, synthesizing, and communicating complex information about the condition of park resources, processes, and values to visitors and the general public, NPS managers and staff, local and state governments, other federal agencies, scientists and scholars, tribes, NGO partners, and Congress. In addition, NPS resource managers and scientists must have the ongoing professional development, tools, and support necessary to effectively engage as professional practitioners, adhering to the highest standards of technical competence, credibility, and integrity.

Focus Areas

- ***Build NPS Capacity and Leadership to Promote Science at All Levels of the Organization, and with Partners, Other Agencies, and the Public***

  Examples may include:

  - Encouraging participation by scientists, scholars, and students in scientific and scholarly research conducted in national parks
  - Expanding the appropriate use of parks as national laboratories for science, and developing tools to facilitate such use
  - Promoting innovative tools and opportunities to engage citizen scientists in data collection and natural resource stewardship
  - Advancing programs that engage youth in science and stewardship activities to help grow the next generation of NPS scientists

- ***Synthesize and Communicate Scientific Information, and Provide Access to Science to Inform Resource Stewardship***

  Examples may include:

  - Facilitating and promoting access to the best available science by supporting communication tools such as the NPS Technical Report Series, park or regional newsletters, and others
  - Engaging NPS staff through webinars that provide relevant and current information on key resource management, stewardship, and science issues

- Publishing NPS scientific findings in peer-reviewed publications and highlight publications in the traditional and social media through press releases and advisories, and ensuring their accessibility to park managers

- ***Proactively Communicate Across the NPS and with Congress, the Department of the Interior, and Other Stakeholders about NPS Stewardship and Science Priorities***

  Examples may include:

  - Responding to congressional or administrative inquiries in the context of this *Natural Resource Stewardship and Science Framework*

  - Ensuring that reasons for NPS natural resource stewardship and science priorities are effectively articulated to administration officials, appropriators, and partner agencies

  - Establishing regular briefings with congressional members to proactively provide information on NPS stewardship science issues, priorities, and concerns

  - Supporting education, information, and communication outreach on natural resources in cooperation with other NPS programs and directorates

Suggested citation

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