

From ATBI to BioBlitz: A National Strategy for Biodiversity Stewardship in Parks

National Park Service Biodiversity Stewardship Steering Committee¹

Introduction

With increasing global threats, National Park Service units are becoming critical reserves of biodiversity. Many parks engage in efforts to improve their knowledge about biodiversity using various approaches. As an outgrowth of the Centennial Challenge, parks engaged in biodiversity stewardship have come together to develop a national biodiversity strategy to ensure that individual park surveys contribute broadly across the National Park System. This national approach will cultivate a support network that allows parks to learn from each other's experiences and expertise, develop guidance and support for the range of approaches to biodiversity stewardship, and coordinate data management and sharing.

The diversity of native species of plants and animals, and the genetic material they contain (biodiversity), is declining globally at a historically unprecedented rate. National parks may be responsible for becoming critical preserves of biodiversity in the face of increasing global change threats. National Park Service (NPS) lands are considered refuges of biodiversity due to their relatively undisturbed state, and serve as repositories of species and genetic biodiversity. Historically, biological surveys on NPS lands have focused on charismatic species such as birds, mammals, fish, amphibians, reptiles, trees, shrubs, and herbaceous plants. Biodiversity stewardship focuses on lesser known but more diverse groups of life forms such as: invertebrates, non-vascular plants, and fungi, among others. These taxa can serve as indicators to assess impacts of global threats such as climate change, or more local activities such as energy development, as well as predict likely outcomes of associated management actions. Improving our understanding of biodiversity in parks is crucial to managing ecosystems so they maintain adequate resiliency to withstand these threats.

A range of approaches helps parks meet their goals

Many NPS units are engaging in efforts to improve knowledge about biodiversity within parks using various approaches. These efforts range from the long-term, taxonomically focused All-Taxa Biodiversity Inventories (ATBIs), to large-scale, short-duration BioBlitzes, in addition to ongoing inventories and subsequent monitoring efforts. For example, Great Smoky Mountains National Park, in Tennessee, has pioneered an ATBI since 1997. An ATBI is an intense inventory of all species in a defined area, such as a national park or natural reserve (Janzen and Hallwachs 1994). To date, this ATBI has discovered over 850 species new to science and over 6,250 species that are new records for the park. BioBlitzes are shorter duration (often weekend) mini-inventories that typically target particular taxa (Karns et al. 2006). Many engage school groups and "citizen scientists" of all ages. BioBlitzes can generate large quantities of data in short amounts of time and often highlight the educational aspects of biodiversity stewardship. They are an essential component of any ATBI.

Many parks conduct BioBlitzes but have not yet committed to a full ATBI. Others are

working on longer-term efforts focused on specific taxa or microhabitats (or both) such as lakes or caves. In addition, NPS and the National Geographic Society are collaborating to host one large-scale BioBlitz each year, through 2016, the NPS Centennial. By improving our knowledge of biodiversity in parks, all of these activities support and enhance the basic conservation mission of NPS. In addition, they provide the public with opportunities to learn about natural resources in parks and to participate in stewardship of our nation's heritage.

Towards a national strategy

While individual parks have been conducting ATBI and BioBlitz activities since the pilot efforts of Great Smoky Mountains National Park, there has been a recent growth in interest. In 2008, nine parks were funded through the Centennial Challenge to conduct biodiversity stewardship activities. These parks and the Natural Resource Science and Stewardship Directorate recognized that although the attributes, resources, and special purpose of each park may indicate different approaches or intensities of activities to biodiversity inventory, outreach, and management, all biodiversity stewardship efforts share a number of needs that would benefit from a coordinated, national approach. These needs include the following:

- High quality data to maintain scientific credibility and meaningful participant activity. Data needs include species identification, database management, and curation.
- Volunteer management and logistical support, which are important considerations at any scale of activity.
- Coordinated efforts among parks, neighbors, and the scientific community, to improve efficiency and ensure that data contribute to the broader body of scientific knowledge.
- Evaluation tools to determine benefits to volunteers and citizen scientists.

The 2008 Centennial Challenge funded parks contributed a portion of their allocations to develop components of a national strategy that would provide support to other parks that are interested in conducting ATBIs and BioBlitzes and ensure that individual park efforts contribute broadly across the National Park System. The Biological Resource Management Division of the Natural Resource Program Center was identified as the point of contact for developing a national strategy, and funding was assigned to database development, social science assessment, and a national meeting. At the national meeting, a steering committee was formed comprised of representatives from the nine parks that received funding, and Great Smoky Mountains National Park, as well as a few other interested individuals. The steering committee has spent much of the past year achieving consensus on mission, vision, goals, objectives, and strategies that are inclusive of the very diverse approaches shared at the two sessions and group of posters highlighted at the 2009 George Wright Society meeting (see Appendix).

Share your experiences and expertise: How can diverse parks engage?

The national strategy is truly a grassroots effort and relies on parks contributing materials

and expertise to assist each other. There are currently a number of opportunities that would benefit from contributions from parks engaged in the range of potential biodiversity stewardship activities. We welcome parks and partners to contribute in the following ways:

- Assist in developing and writing reference handbooks.
- Share resources such as existing guidance documents.
- Test interim database modifications.
- Help develop a curation strategy.
- Serve on the Steering Committee.
- Assist with Discover Life in America national conference planning.
- Pilot test instruments to evaluate benefits to volunteers.
- Provide feedback on Intranet websites: <http://nrpcsharepoint/brmd/ATBI/default.aspx>; <http://science.nature.nps.gov/atbi/index.cfm>.

By working together we can ultimately magnify the returns of any individual park's sampling and outreach efforts.

If you would like more information, to contribute to any of the above activities or to be added to our mailing list, please contact Kirsten Leong (kirsten_leong@nps.gov, 970-267-2191).

Endnote

1. The NPS Biodiversity Stewardship Steering Committee includes the following members:

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Appendix

Mission

The mission of the national biodiversity steering committee is to develop a system-wide

coordinated approach to Biodiversity Stewardship on NPS lands that is: scientifically rigorous; assists parks in best meeting their individual scientific, educational, and stewardship objectives related to biodiversity; and encourages public engagement with science and biological resources.

Vision

The national strategy for biodiversity stewardship is recognized as providing NPS units across the system with the support structure and materials needed to engage in a suite of activities to improve understanding and conservation of biodiversity in parks. Regardless of scope and scale, activities are scientifically rigorous and data are integrated with NPS data management systems, such as NPSpecies. Biodiversity activities enable the public (including professional scientists, policy makers, and the general public) to recognize that NPS lands represent values and opportunities that extend well beyond basic recreation in the park; these lands have a unique value as protected storehouses of biological diversity and present unparalleled opportunities for biological inventory, research, and conservation. New knowledge provided by these activities enhances the basic conservation mission of the NPS by giving both managers and policy makers detailed information about resources parks protect. This knowledge adds to the tools, targets and opportunities needed for true, science-informed decision making. These activities also promote science-inspired and science-informed resource stewardship by directly engaging the public in their heritage. All of these benefits extend into the societies, ecosystems, and landscapes well beyond the parks' physical boundaries.

Goals

- Develop a strategy and network that facilitates internal communication about NPS biodiversity programs.
- Develop resources and guidance documents for the range of approaches to biodiversity stewardship.
- Coordinate management, presentation, and sharing of data.
- Coordinate specimen curation and identification needs.
- Utilize data for science-informed decision making.
- Inform and inspire resource stewardship through partnerships.
- Integrate NPS efforts with external biodiversity initiatives.

Guiding principles

- Biodiversity activities will develop NPS capacity for stewardship, both by building a stronger scientific foundation for management decisions and by developing public support and appreciation for science in parks.
- Understanding biodiversity is a fundamental component of the NPS core mission to conserve resources; we cannot conserve resources unless we know which resources are in parks.
- NPS lands are increasingly important areas for the study and conservation of biodiversity because they are prioritized for protection from the myriad threats to our nation's

rich natural heritage, which include climate change, energy development, altered hydrology, invasive species, pollution, and more.

- The attributes, resources, and special purpose of each park may indicate a need for different approaches or intensities of activities related to biodiversity inventory, outreach, and management.
- Different types of events may result in different kinds of data collection with different curation needs; however, for participant activity to be meaningful and for NPS to maintain scientific credibility, some level of usable scientific data must be recorded from all activities.
- Engaging the public takes many forms, ranging from partnerships with professional scientists, to volunteers, to school groups, to other NPS employees. The type of public involved will depend on specific park objectives.
- Coordinated efforts with partners, such as adjacent protected area managers, other neighboring landowners, state agencies, non-governmental organizations, and the scientific community are essential to improve our understanding of the diversity of park resources, potential threats, and to engage the public in their conservation.

National strategy steering committee objectives

1. Be the recognized as the “go to” NPS resource for guidance related to biodiversity stewardship activities and needs.
2. Develop reference handbooks and resources (e.g., research permit templates, sample curricula) for various approaches to biodiversity stewardship.
3. Articulate and communicate the scientific considerations present in different approaches to biodiversity stewardship.
4. Articulate and communicate the visitor services and public relations considerations inherent in different approaches to biodiversity stewardship.
5. Articulate and communicate the resource management considerations present in different approaches to biodiversity stewardship.
6. Broaden support for biodiversity stewardship within NPS and beyond the agency.
7. Apply models for NPS biodiversity stewardship within NPS and beyond the agency.
8. Apply results for NPS biodiversity stewardship within NPS and beyond the agency.
9. Most effectively harness existing networks and funding sources, e.g., Centennial Challenge non-Federal matching funds, 20% Fee Demo funds, the NPS Research Learning Center Network, the NPS Inventory and Monitoring Network, the Cooperative Ecosystems Studies Unit (CESU) Network.
10. Develop a series of proven, successful approaches that can justify the time, effort, and scientific results to stakeholders, including the scientific community and general public.

Long-term strategy

1. Develop relationships with scientific community and others involved with biodiversity stewardship, so that NPS is recognized by scientists as a potential partner, study site, or source of resource data.

2. Establish NPS as a key partner in existing consortia, such as ATBI Alliance, American Institute of Biological Science, Taxonomic Working Groups, Encyclopedia of Life, etc.
3. Strengthen NPS science program's ability to support biodiversity stewardship activities.
4. Develop internal communication plan to facilitate information sharing between parks.
5. Develop plan to evaluate benefits of public participation (both in terms of scientific contributions and attitudinal changes).
6. Develop sustainable funding plan.
7. Develop links with management (ensure results are more than "a species list"). How will results help park management plans within the park, and regional land use planning?
8. Address logistics related to scientific collections, such as data management, permitting and curation.
9. Address logistics related to people management, such as developing an Incident Command System, establishing a 1-800 number for the event, link to Volunteers In Parks.

Short-term strategy (Fiscal Year 2009 [ends September 30th, 2009])

1. User requirements contract to be completed—will result in refinement of national database, guidelines for data management.
2. Citizen Science Assessment Task Agreement to be completed—ensure results feed into strategy that can be broadly applied to evaluation of individual park efforts.
3. Utilize experience of parks to develop reference handbooks.
4. Develop funding sources.
5. Leverage face-to-face communication opportunities such as the Discover Life in America national meeting and George Wright Society biennial meeting to strengthen the network of parks engaged in biodiversity stewardship.
6. Further develop website to quickly disseminate information.
7. Update briefing statement and other high level national strategy communication.
8. Develop catalog of parks' experiences with biodiversity stewardship activities.

Glossary

ATBI. An ATBI is an intense inventory of all taxa to the species level to the degree possible in a single site, followed by on-going further inventory as needed by specific taxa and in-depth basic and applied biodiversity research and development (Janzen and Hallwachs 1994).

Bioblitz. A BioBlitz is part rapid biological survey and part public outreach event that brings together scientists and volunteers to compile a snapshot of biodiversity in a relatively short amount of time (Karns et al. 2006; Lundmark 2003). It is not intended to be an exhaustive inventory, but can contribute to a more comprehensive ATBI effort.

Biodiversity. The variety of living organisms considered at all levels of organization,

including the genetic, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein (Meffe and Carroll 1997).

Citizen science. Citizen science refers to participation of the general public as field assistants in scientific studies (Cohn 2008; Irwin 1995). Volunteers may have no specific scientific training, and typically perform, or manage, tasks such as observation, measurement, or computation.

Inventory. Natural resource inventories are extensive point-in-time surveys to determine the location or condition of a resource, including the presence, class, distribution, and status of biological resources such as plants and animals. Inventories are designed to contribute to our knowledge of the condition of park resources and establish baseline information for subsequent monitoring activities (NPS 2008).

Partner. “Partner” is an umbrella, generic term to refer to individuals, organizations, and other entities interacting in a relationship with the Department of the Interior, or its bureaus or offices, to achieve a common goal in support of the Department’s mission (DOI 2008).

Public. The public includes all individuals, organizations and other entities who have an interest in or knowledge about, are served by, or serve in, the parks and programs administered by the NPS. They include (but are not limited to) recreational user groups, the tourism industry, tribes and Alaska Natives, environmental leaders, members of the media, permittees, concessioners, property owners within a park, members of gateway communities, and special interest groups; all visitors-domestic and international; those who come in person, and those who access our information on the world wide web; those who do not actually visit, but value, the national parks; and those who participate and collaborate with the NPS on a longer-term basis. One very important group that is not usually thought of as being part of the “public” is NPS employees (NPS 2007).