National Park Service
U.S. Department of the Interior

State of the Park Report

Catoctin Mountain Park
Maryland

2014

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Disclaimer. This State of the Park report summarizes the current condition of park resources, visitor experience, and park infrastructure as assessed by a combination of available factual information and the expert opinion and professional judgment of park staff and subject matter experts. The internet version of this report provides the associated workshop summary report and additional details and sources of information about the findings summarized in the report, including references, accounts on the origin and quality of the data, and the methods and analytic approaches used in data collection and assessments of condition. This report provides evaluations of status and trends based on interpretation by NPS scientists and managers of both quantitative and non-quantitative assessments and observations. Future condition ratings may differ from findings in this report as new data and knowledge become available. The park superintendent approved the publication of this report.

Executive Summary

The mission of the National Park Service is to preserve unimpaired the natural and cultural resources and values of national parks for the enjoyment, education, and inspiration of this and future generations. NPS Management Policies (2006) state that "The Service will also strive to ensure that park resources and values are passed on to future generations in a condition that is as good as, or better than, the conditions that exist today." As part of the stewardship of national parks for the American people, the NPS has begun to develop State of the Park reports to assess the overall status and trends of each park's resources. The NPS will use this information to improve park priority setting and to synthesize and communicate complex park condition information to the public in a clear and simple way.

The purpose of this State of the Park report is to:

- Provide to visitors and the American public a snapshot of the status and trend in the condition of a park's priority resources and values;
- Summarize and communicate complex scientific, scholarly, and park operations factual information and expert opinion using non-technical language and a visual format;
- Highlight park stewardship activities and accomplishments to maintain or improve the State of the Park;
- Identify key issues and challenges facing the park to help inform park management planning.

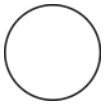
The purpose of Catoctin Mountain Park (CATO) is to provide quality recreational opportunities in the Catoctin Mountains and serve as a setting and buffer for the Presidential Retreat, while protecting and conserving the park's natural and cultural environments as envisioned by New Deal conservation programs.

Catoctin Mountain Park is significant because it:

- Is an early and continuing example of conservation practices resulting in the regeneration of an Eastern deciduous forest;
- Provides outstanding scenic value at the transition of the Monocacy River Valley and the Catoctin Mountains in the Piedmont and Blue Ridge geologic provinces;
- Provides diverse outdoor recreation opportunities in a mountain setting near the population centers of the mid-Atlantic region;
- Provides pristine aquatic habitat for fishing and other recreational activities;
- Serves as a setting for the Presidential Retreat, Camp David, a place where international leaders convene to discuss world peace and international diplomacy;
- Was one of 46 Recreational Demonstration Areas established in the 1930s, and represents an outstanding example of New Deal Era programs to recast the landscape for recreation and conservation purposes;
- Is the location of the oldest operating cabin camps for the disabled in the nation, and is one of the original locations that the Office of Strategic Services trained, and hosted the Nation's first Job Corps Center; and
- Protects the cultural heritage of the Catoctin Mountains that dates back 3,500 years, ranging from stone tool making, to agriculture, to charcoal production.

The summary table, below, and the supporting information that follows, provide an overall assessment of the condition of priority resources and values at Catoctin Mountain Park based on scientific and scholarly studies and expert opinion. The internet version of this report, available at http://www.nps.gov/stateoftheparks/cato/, provides additional detail and sources of information about the resources summarized in this report, including references, accounts on the origin and quality of the data, and the methods and analytical approaches used in the assessments. Reference conditions that represent "healthy" ecosystem parameters, and regulatory standards (such as those related to air or water quality) provide the rationale to describe current resource status. In coming years, rapidly evolving information regarding climate change and associated effects will inform our goals for managing park resources, and may alter how we measure the trend in condition of park resources. Thus, reference conditions, regulatory standards, and/or our judgment about resource status or trend may evolve as the rate of climate change accelerates and we respond to novel conditions. In this context, the status and trends documented here provide a useful point-in-time baseline to inform our understanding of emerging change, as well as a synthesis to share as we build broader climate change response strategies with partners.

The Status and Trend symbols used in the summary table below and throughout this report are summarized in the following key. The background color represents the current condition status, the direction of the arrow summarizes the trend in condition, and the thickness of the outside line represents the degree of confidence in the assessment. In some cases, the arrow is omitted because data are not sufficient for calculating a trend (e.g., data from a one-time inventory or insufficient sample size).

Condition Status		Trend in Condition		Confidence in Assessment	
	Warrants Significant Concern		Condition is Improving		High
	Warrants Moderate Concern		Condition is Unchanging		Medium
	Resource is in Good Condition		Condition is Deteriorating		Low

State of the Park Summary Table

Priority Resource or Value	Condition Status/Trend	Rationale
Natural Resources		web
Air Quality		Estimated ozone, nitrogen and sulfur wet deposition, and average visibility at Catoctin Mountain Park for 2005–2009 warrant significant concern based on NPS Air Resource Division benchmarks.
Geologic Resources		Some drainages may be more susceptible to erosion (Whiskey Still Creek) or sedimentation (Owens Creek) than others, and the park has introduced a number of measures to ensure bank stability. Two tectonic caves occur in the park, but karst is not present. Most mountain slopes in the park are less than 25%, and natural slope processes are operating unimpaired.
Water Quantity and Quality – Owens Creek		Owens Creek has an overall evaluation of Good condition based on selected measures of water chemistry, indices of the benthic macroinvertebrate community and physical habitat, and streamflow measurements. Occasional high values for water temperature and specific conductance are of concern because of their negative effects on fish, and extremely high phosphorus values are of significant concern.
Water Quantity and Quality – Big Hunting Creek		Big Hunting Creek has an overall evaluation of Good condition based on selected measures of water chemistry, indices of the benthic macroinvertebrate community and physical habitat, and streamflow measurements. Occasional high values for water temperature and specific conductance are of concern because of their negative effects on fish, and extremely high phosphorus values are of significant concern.
Eastern Deciduous Forest		Forest covers 95% of the park, and 28 native species that are listed by the State of Maryland as rare, threatened, endangered, or on the State watch list occur in the park. CATO has the lowest rate of native tree seedling regeneration among 39 national parks monitored between Virginia and Maine, and is being adversely affected by overbrowsing by deer. Alien herbaceous plants were found in 69% of forest monitoring plots.

Priority Resource or Value	Condition Status/Trend	Rationale
Fish Communities		The median Fish Index of Biotic Integrity for four stream sites at CATO in 2006 and 2010 was 3.8, which is rated as Fair. Three measures of the abundance of brook trout were rated as Fair or Poor at 3 stream sites using data from 1989–2011.
Wildlife Communities		164 species of birds have been documented at CATO. The Bird Community Index score showed medium integrity, and has remained stable over the past five years. The density of white-tailed deer in the park is extremely high, with 87 deer per square mile in 2010. 17 species of amphibians and 13 species of reptiles have been documented in the park.
Landscape Dynamics		95% of the area within the park is covered by forest, and 75% of the area within a buffer that is five times the size of the park is forested. Only 0.2 % of the area within the park, and 2.9% of the area within a buffer that is five times the size of the park, is covered by roads and parking areas and other impervious surfaces
Cultural Resources		web ▸
Archeological Resources		Archeological surveys have been conducted for all areas in the park with high potential for archeological sites. 100% of the 131 known archeological resources listed in the NP Archeological Sites Management Information System (ASMIS) database are in GOOD condition.
Cultural Anthropology		The completeness of documentation is low (5 to 25% complete) for the association of various groups and users of the park. There is no ethnographic overview or systematic understanding of information.
Cultural Landscapes		Cultural Landscape Inventories have been completed for only 2 of the 6 potential cultural landscapes in the park. The Catoctin Mountain Park parent cultural landscape is in FAIR condition, and the Camp Misty Mount component landscape is evaluated as being in GOOD condition.
Historic Structures in Camp Greentop and Camp Misty Mount		The List of Classified Structures database and National Register nominations are 100% complete for the historic structures in Camp Greentop and Camp Misty Mount, but no historic structure reports or historic structure assessment reports have been done. Of the 64 structures at Camp Greentop and Camp Misty Mount, 79% are assessed to be in GOOD condition, 17% are in FAIR condition, and 3% are in POOR condition. The park is able to repair/stabilize cabins at a rate of only approximately one cabin per fiscal year.
Other Historic Structures		Of the 3 other historic structures listed in the List of Classified Structures, 2 are in GOOD condition and 1 is in FAIR condition. However, at least six other historic structures at Braestrup Tract and Mission 66 areas (Owens Creek Area & Chestnut Area) may be National Register-eligible but have not yet been entered into the LCS.
Museum Collections		100% of objects are catalogued, except for archeological artifacts recently obtained by the park. Facility conditions for specimens stored at the park museum are inadequate because the room containing the collection is not climate controlled. The majority of the park's archival resources have not yet been accessioned or evaluated.

Priority Resource or Value	Condition Status/Trend	Rationale
Visitor Experience		web
Number of Visitors		The number of visitors to Catoctin in 2012 was estimated at 263,797, which was about half of the mean annual visitation (496,874) for the 10-year period of 2002–2011. There are many repeat visitors from year to year.
Visitor Satisfaction and Safety		The percent of visitors who said they were satisfied with their visit to CATO in 2008 through 2012 was 100%, 92%, 98%, 95% and 100%, for an average of 97.0% of visitors satisfied. Safety briefings are conducted as part of all interpretation and education programs. The number of reported visitor injuries or incidents is very low, with an incident rate of 2 per 100,000 visitor days.
Education and Outreach Programs		The number of educational programs provided by staff at Catoctin has increased over the past five years, and attendance numbers are increasing. Outreach programs include roving interpretation inside the park as well as programs and presentations in the community.
Recreational Opportunities		The number of people camping in the park has been slowly decreasing based on visitor counts and campsite registrations and receipts, which could be related to an overall decrease in outdoor recreation nation-wide. Hiking, fishing, mushroom and berry gathering, scenic driving, wildlife viewing, picnicking, and photography are all important to visitors based on visitor surveys.
Natural Landscape Experience		Views and overlooks, dark night skies, and natural soundscapes are all important values for visitors based on visitor use surveys, but baseline measurements and additional studies are needed to determine status and trends in these values.
Volunteers and Partnerships		Approximately 600 volunteers contribute approximately 12,000 hours of service per year at CATO. The park engages in a wide range of formal and informal partnerships as part of maintaining and improving the condition of resources and the visitor experience for this and future generations.
Park Infrastructure		web
Facility Condition Index (Overall FCI)		The 261 assets at CATO have an overall FCI of 0.109, which is Fair based on industry and NPS standards. The FCI is the cost of repairing an asset divided by the cost of replacing it, and is used to measure the condition of buildings, roads, trails, water systems, and other park infrastructure assets.
Energy Consumption		Energy usage (BTUs per gross square footage of buildings) at the park in 2012 was 35.2% which was lower than the average for the previous 4 years (Source: NPS Annual Energy Report). The park uses motion-sensor lighting and inspects buildings to keep electricity bills down.
Water Consumption		Water consumption at the park in 2012 was 37.9% lower than the 4-year average for 2008–2011 (Source: NPS Annual Energy Report).

Summary of Stewardship Activities and Key Accomplishments to Maintain or Improve Priority Resource Condition:

Catoctin Mountain Park has responsibility for managing natural and cultural resources of national significance to the American people. The items below provide examples of stewardship activities and accomplishments by park staff and partners of Catoctin Mountain Park to maintain or improve the condition of park resources and values for this and future generations:

Natural Resources

- Deer management strategy has been designed to maintain the integrity of the forest, including working with the public to develop the Environmental Impact Statement, and monitoring the regeneration of forest plants
- Reduction of deer numbers to allow recovery of forest
- Continuing efforts to reduce invasive plant and animal species, such as the removal of barberry and other alien plant species.
- Exotic Plant Management Team (EPMT) work conducted annually to control invasive plants
- Monitoring of forest vegetation by the National Capital Region Inventory & Monitoring (I&M) Network and park staff
- Actively monitoring fish populations in partnership with Maryland Department of Natural Resources (MDNR)
- Access to streams is restricted during trout spawning season to protect fish
- Efforts have been taken to reduce sedimentation into streams that harm fish, such as installing silt fences
- Monitoring of water quality is done monthly by I&M and park staff
- Joint fisheries agreement with the State of Maryland
- Completing Natural Resource Condition Assessment to synthesize existing natural resource data for the park
- Riparian buffer planting to reduce erosion
- Working with partners to improve stream condition by establishing native plants outside of the park
- Working with maintenance crews to conduct compliance before taking actions that affect natural and cultural resources
- Geoscientist in the Park to analyze proper placement of trails based on information from the park soils map
- Partnership with United States Department of Agriculture (USDA) Forest Service to monitor gypsy moths and control outbreaks
- Fire management plan. The park is trying to get an active prescribed burning program in place
- The Park's Foundation Document has been recently updated to identify priority resources based on the park's purpose and significance

Cultural Resources

- A four-year archeological survey was recently completed
- Ongoing condition assessments for archeological resources and other cultural resources
- National register nomination for the entire park completed
- A new baseline has been established for cultural resource inventories in park, to provide information for the Cultural Landscape Inventory and List of Classified Structures
- Roof replacement on historical buildings
- Historic stone wall repaired at visitor center
- Efforts to inventory and remove graffiti from historic buildings
- Protecting cabins by staining them to protect from exposure to elements

Visitor Experience

- The park has significantly increased the number of education and outreach programs, including new school programs
- Camp Misty Mount and the Adirondack Shelters are now part of the National Campground Reservation System for easier reservations by visitors
- Efforts are being made to connect the northern portion of the Catoctin Trail to the Appalachian Trail
- All wayside interpretive displays have been improved
- Seamless cooperation with adjacent Cunningham Falls State Park
- Presentations to schools about deer reduction efforts
- CATO received the regional Support to Interpretation award from the National Capital Region
- Law enforcement active patrolling of trails to locate hazard trees and other items that might affect visitor safety
- Foot patrols by law enforcement through camps for visitor and resource protection
- A section of trail was developed parallel to a road to improve visitor safety (visitors previously had to hike on the road)
- Boy Scouts and other volunteer groups have contributed considerable time to help the park maintain trails; scouts completed access ramps at Greentop cabins
- Artist in Residence planned for both spring and summer, with plans for gallery shows in Frederick
- More than 600 volunteers have contributed more than 12,000 volunteer-hours of time to help the park maintain resources
- Park is working to develop volunteer leaders who will in turn organize volunteer groups

- Second Nature, Bridging the Watershed, and First Bloom programs
- School groups organized and brought to the park by Latino-American group
- Volunteers from GeoCorps developed a geology website for the park, and conducted erosion studies in streams
- Re-establishment of partnership with Job Corps. Job Corps workers improved a park trail to improve wheelchair accessibility.

Park Infrastructure

- Installing new lighting fixtures with energy reduction features such as motion sensors, and orienting them downward to reduce light pollution
- Hazard trees removed along roads and in camp areas to improve visitor safety
- Primary electric transmission lines through the park were replaced
- Park is instituting a more organized trail maintenance system, similar to "adopt a trail"
- CATO has joined the Climate Friendly Parks program, which is a network of parks nationwide that are putting climate friendly behavior at the forefront of sustainability planning. A student intern was hired in 2012 through the Student Conservation Association to conduct an emissions inventory and develop an action plan for the park.
- Youth Conservation Corps (YCC) program since 1970s
- Fire engine with operators acquired for fire protection of all resources

Key Issues and Challenges for Consideration in Management Planning

INTRODUCTION

Catoctin Mountain Park celebrated its 75th anniversary in 2011 but last completed a comprehensive General Management Plan in 1976 to define its mission, roles, and priorities. A comprehensive park plan, referred to as a Foundation Document and its associated Resource Stewardship Strategy are crucial to filling this planning deficiency. These plans will define and update our mission, roles, and priorities to serve the visitors and protect the park resources in the 21st century.

In preparation for the 100th anniversary of the National Park Service in 2016, Catoctin was also selected to complete a State of the Park Report. Park staff identified priority objectives and action items to guide management over the next five years, protecting the park's natural and cultural resources and developing new opportunities for visitors. The park also worked with a variety of experts in the fields of natural and cultural resources, interpretation, law enforcement, and facility management to develop a set of baseline assessments that can now serve as a management planning model for other national parks across the country.

Fiscal constraints, changing visitor demographics, and a need to diversify our workforce are all ushering in complex challenges for parks as the NPS enters its second century. The State of the Park Report will help us strategically access and communicate park conditions and our current plan for the future. Our ability to plan ahead necessitates that we have objective baseline data to assess our park operations and articulate plans that address the multifaceted needs of the parks.

RESOURCE PRESERVATION

The park has many significant resources to preserve, manage, protect and interpret. The park also conserves the geo-physical processes and biological communities that together form this unique natural area. Monitoring results has revealed that diverse taxonomic groups such as rodents, birds, lizards, and snakes remain stable. There are concerns for the effects of climate change, though still undetermined, may dramatically alter the mountains. A number of alien, invasive plants and animals already have a foothold and the NPS needs to remain diligent in its efforts to limit their continued expansion. These require that we devote attention to monitoring and protecting the natural resources of the park; including the land, water, and air resources surrounding us. In order to assess all these resources and their competing needs, we must develop comprehensive management plans to protect and interpret them.

NATURAL RESOURCES

Protect Watersheds

- Headwaters/well head protection
- Riparian buffer acquisition and protection
- Brook Trout preservation
- Sedimentation prevention
- Geologic hazard identification

Water Quality. The park's water quality is impacted by both developed (largely permitted and regulated) and agricultural (largely unregulated) activities. Quantity of water flow to and within the park during drought has decreased over the past 30 years and impacted water quality. Significant water quality improvements have been seen where regulations and agreements have addressed quantity and quality issues (e.g., dissolved oxygen and temperature). However, significant improvements remain to be made (e.g., sediment, phosphorus, and nitrate). These improvements will require changes in both upstream agricultural activities and nonpoint source runoff. Stream sediment and nutrients will continue to affect the water quality and habitat of Big Hunting and Owens Creeks, downstream from their junction.

Protect Wildlife

- Habitat and migration corridors protection

Fish and Wildlife. The park has an adequate assessment on numbers and condition of most fish and wildlife species in the corridor. Bioblitzes could help us confirm our data snapshots of what is present. White-nose syndrome is likely on the way for local bat populations and perhaps Chronic Wasting Disease in deer. Between warming temperatures and increasing numbers of invasive species and diseases, more and more native species are losing ground. The park needs to find ways to quantify and address these issues. Some of the changes are likely due to visitor impacts, and determining an appropriate number of visitors and their uses to the habitat without impairing it is a key planning issue for the park.

Protect/Restore Vegetation

- Riparian buffer protection
- Invasive species control
- Restoration of fire into the ecosystem

Although the park is 97% forested, there are still riparian buffers that need to be planted both inside and outside the park. While the park can inventory, treat, and attempt to control these species on park lands, it has little to no control over how park neighbors manage their land. Private lands around the park continue to be seed beds for invasive species that infest the park. Serious infestations have had major effects on the landscape. Combined with the anticipated effects of accelerated climate change, which may include warmer winters, our invasive plant problems could become much worse.

Invasive Species: Several invasive species threaten to change the ecosystem in the coming decades.

- Emerald Ash Borer: Catoctin contains millions of ash trees—the arrival of this pest seems almost inevitable
- Hemlock Woolly Adelgid: Hemlock vegetation along park streams is rapidly disappearing
- Gypsy Moth: is once again cycling through oak populations
- American Chestnut Blight continues to scour this native hardwood

Another compounding factor has been the removal of fire from the park's ecosystem for nearly 100 years. The forest evolved under a naturally occurring fire regime that limited alien species encroachment throughout the park. These fires encouraged native plant growth. A new prescribed fire strategy is being developed and tested.

Protect Air Quality

- Monitor air quality in park to protect views and vistas
- Protect night sky to ensure normal operation of ecosystem processes (mating, migration, etc.)

Catoctin Mountain Park is continuously looking for ways to partner with other agencies to improve the management of both natural and cultural resources. External developments that may impact park resources include light, heat and water pollution that will affect the soundscape, night skies, and the aquatic environment.

CLIMATE CHANGE

Overshadowing all of our concerns for the natural and cultural resources are the potential consequences of rapid climate change. Continued increases in air temperatures along with predicted changes in precipitation, relative humidity, storm frequency and storm intensity will bring about great changes in the ecological communities we know and understand today. However, with the likely extirpation of some species and the new introductions of others, the full ramifications of those changes (and how to plan for them) remain unpredictable (Harley et al. 2006, Hoegh-Guldberg and Bruno 2010).

Reduction of greenhouse gas emissions at Catoctin will largely focus on reduction of electric consumption as it is 70% of the source of our emissions. Through educational outreach programs, awareness of the impact of invasive species on native flora and fauna may open new opportunities to work more closely with private landowners.

CULTURAL RESOURCES

- *Archeological Sites*: A comprehensive archeological survey has been completed for the park. Currently and historically, most archeological sites are located as the result of development projects, which often leads to documentation and destruction of the sites. Baseline information that describes the integrity of historic and archeological sites is also critical to understanding and managing these unique resources.
- *Cultural Anthropology*: An Ethnographic Overview and Assessment has not been completed for the park, therefore the extent of ethnographic resources is not fully understood. Existing oral histories provide some information on potential ethnographic associations with people who participated in the New Deal-era programs that established the Recreational Demonstration Area that would become Catoctin Mountain Park. There are no identified contemporary tribal associations with park resources. Baseline documentation of ethnographic groups and resources is critical to understanding and managing these unique resources.
- *Historic Structures*: With limited financial resources, long-term sustainability of historic structures will continue to be a challenge. Historic structures require constant attention and present safety and accessibility concerns. Historic structures often do not meet current ADA requirements, nor do they meet modern fire codes for sprinklers and other safety infrastructure. Upgrading offices, museums and other public spaces to meet modern requirements is a major challenge for the park.
- *Cultural Landscapes*: The completion of the Cultural Landscape Report is a park priority. The park contains two Historical Districts, listed on the National Register of Historic Places, and the entire park is worthy of admission as a Natural Register Historic District.
- *Curatorial Collections*: The Park has a large collection of historical photos and artifacts. Updated and expanded museum exhibits, visual storage of artifacts, and enhanced public access to curated photographs, records, and artifacts will allow greater research opportunities and additional public information through popular articles and scientific and scholarly works. The challenge is to protect these artifacts while providing access and presenting these materials in ways that are discoverable, accessible and relevant to the researcher and public needs. These materials effectively tell the story of Catoctin and the events that preceded and followed the park establishment and transformed the demographics, culture, and environment of this part of Maryland.

VISITOR SERVICES

The National Park Service as an agency is trying to improve connections with underserved demographic groups that visit National Parks infrequently. As visitation declines in the park Catoctin plans to take advantage of its location within metropolitan Washington D.C. and Baltimore regions to increase engagement with minorities and urban populations. At the same time, the park is using the internet and distance learning programs to inform students about the park's resources within their own classrooms. Updating and expanding digital media programs are a key component in offering new visitor opportunities to a public. Social media and web access to the events and undertakings of the park will be instrumental for increasing visitor knowledge of historical events and understanding scientific and scholarly research related to park resources.

Public transportation to the park has decreased over the last several years. In addition, one of the greatest changes schools face is transporting students on field trips. Catoctin plans to enhance both public and student transportation to the park through partnerships. The park is developing additional programming for youth through the YCC, SCA and VIP programs. The goal is to provide work experiences such as internships as well as educational opportunities.

Scenic driving is the number one visitor activity in Catoctin Mountain Park.

- Ensuring visitor and employee safety on Route 77 and roads surrounding the park.
- Closures to address both resource and security needs

Our law enforcement mission to protect the Presidential Retreat is unique within the National Park System and requires rapid responses on short notice due to changing world events. Our intent is to provide an environment where world leaders can relax and reflect upon important issues in a peaceful and secure setting.

ORGANIZATIONAL EFFECTIVENESS

Park managers are searching for ways to improve staff performance and productivity. Increased travel restrictions leave fewer opportunities for professional enrichment, and collaboration with other NPS staff. The current economic crisis, annual budget uncertainty, and changes in human resources hiring practices and requirements are eroding staff morale. Addressing housing, administrative space, commuting, and quality of life issues, cost of living, housing, etc. in support of staff and volunteer retention is a pressing need.

Park Operations

Catoctin Mountain Park presents a wide variety of operational challenges that are not faced by many parks in the National Park system. The rural nature of the park and the small staff size leads to a reliance upon others from the NPS, other agencies of the federal

government, and partners within the community to accomplish the park's mission. The federal government has recently been directed to be more business-minded in regard to our budgets, staffing facility management costs, which include an examination of "life-cycle" costs for all park assets. The funding, staffing and maintenance required to operate facilities must be carefully considered in planning for a sustainable operation. Partnerships with local governments, civic institutions, non-profits and citizens will be a critical component of the long-term strategy to maintain the existing portfolio of park assets.

Motor Vehicle Fleet
One of our greatest sources of carbon emissions is from vehicle use and transportation. Park staff would like to reduce the use of fossil fuels in the management of the park. However, costs of electric vehicles and hybrids (NEV's) are equal to or greater than the cost of using gasoline vehicles. The park will continue its commitment to the use of these vehicles, and seek funding to further enhance its electric fleet.

Park Infrastructure and Facilities Sustainability
Current office space is inadequate for staff needs in some places and oversized in others. At times, crowded offices inhibit productive office work. In addition, current office space (and some visitor infrastructure as well) is not compliant with the American with Disabilities Act. If staffing continues to decline, there will be additional opportunities to reduce our development footprint below 3% of our total land area by consolidating office functions.

While we recently completed a major rehabilitation of our electrical system, the same need exists in our water and sewer system. The park has worked to improve sustainable practices in recent years. In the fall of 2012, the park Environmental Management Team developed a new EMS Program that will help meet the goals of the NPS Green Parks Plan and improve our ability to share information with staff and the public. One of the greatest sustainability challenges the park faces is increased energy costs. Catoctin has the ability to greatly reduce its consumption of fossil fuels and GHG emissions by replacing existing appliance, HVAC, and lighting systems and in some cases by closing or demolishing obsolete facilities.

PARTNERSHIPS AND COMMUNITY INVOLVEMENT

Catoctin Mountain Park has a long history of positive, productive partnerships that assisted with the original creation and development of the park over the last 75 years. The 2006 NPS Management Policies provide us with guidance for developing creative partnerships that ensure the public enjoyment of the park while simultaneously protecting our parks resources from commercialization and heavy-handed economic development that may not be compatible with our mission, or policies favoring specific individual or group over the interests of the general public. While we recognize the beneficial contributions from our existing partnerships, we must also reassess the role, value and appropriateness of our partnerships within the context of our agency's primary mission and the enabling legislation of the park.

Catoctin exists within a 20,000 acre public lands complex that includes two state and two municipal watersheds. A key challenge is working with adjacent land owners with multiple perspectives around the park boundaries. Many members of the park staff have made great strides at continuing and increasing their involvement in community programs such as volunteer fire departments, school and youth programs, and special events.

There has been considerable success with the Volunteer in Parks program and we need to grow additional leadership in our partnership and volunteer communities in order to further expand this program.

Enhancing every visitor's experience at the park can also be accomplished through partnerships and community involvement. Opportunities to engage the park's stakeholders who rely on the tourism industry through orientation and education are being explored as a way to strengthen gateway community relationships and public access to park resources.

CONCLUSION

Catoctin Mountain Park remains an important conservation area at the front range of the Blue Ridge Mountains in Maryland. The park preserves a rich mosaic of cultural and natural resources. In collaboration with its many partners, the NPS continues to strive to understand, monitor and preserve these important resources for their continued enjoyment by present and future generations.

The NPS Centennial in 2016 is a time for us to reassess how well we have met the mandates of our mission to protect, preserve and provide for the enjoyment of these nationally significant resources along the Appalachian Front Range. In the past, the NPS did not have a fully objective set of metrics that could be applied consistently to all parks across the country to evaluate their conditions. The State of the Park process provides us with clear and convenient metrics for the first time. This report will allow us to assess our previous efforts and evaluate their effectiveness in accomplishing our mission. In areas where we are doing well, we can maintain course; but, in realms where we have not met our mandate, we will plan accordingly to use available resources to address the greatest needs. Challenging times require us to be creative in developing new strategies, partnerships, and ways of doing park business to ensure the well-being of these significant resources for future generations to come.

Chapter 1 - Introduction

The purpose of this State of the Park report for Catoctin Mountain Park is to assess the overall condition of the park's priority resources and values, communicate complex park condition information to visitors and the American public in a clear and simple way, and to inform visitors and other stakeholders about stewardship actions being taken by park staff to maintain or improve the condition of priority park resources for future generations. The State of the Park report uses a standardized approach to focus attention on the priority resources and values of the park based on the park's purpose and significance, as described in the park's Foundation Document or General Management Plan. The report:

- Provides to visitors and the American public a snapshot of the status and trend in the condition of a park's priority resources and values.
- Summarizes and communicates complex scientific, scholarly, and park operations factual information and expert opinion using non-technical language and a visual format.
- Highlights park stewardship activities and accomplishments to maintain or improve the state of the park.
- Identifies key issues and challenges facing the park to inform park management planning.

The process of identifying priority park resources by park staff and partners, tracking their condition, organizing and synthesizing data and information, and communicating the results will be closely coordinated with the park planning process, including natural and cultural resource condition assessments and Resource Stewardship Strategy development. The term "priority resources" is used to identify the fundamental and other important resources and values for the park, based on a park's purpose and significance within the National Park System, as documented in the park's foundation document and other planning documents. This report summarizes and communicates the overall condition of priority park resources and values based on the available scientific and scholarly information and expert opinion, irrespective of the ability of the park superintendent or the National Park Service to influence it.

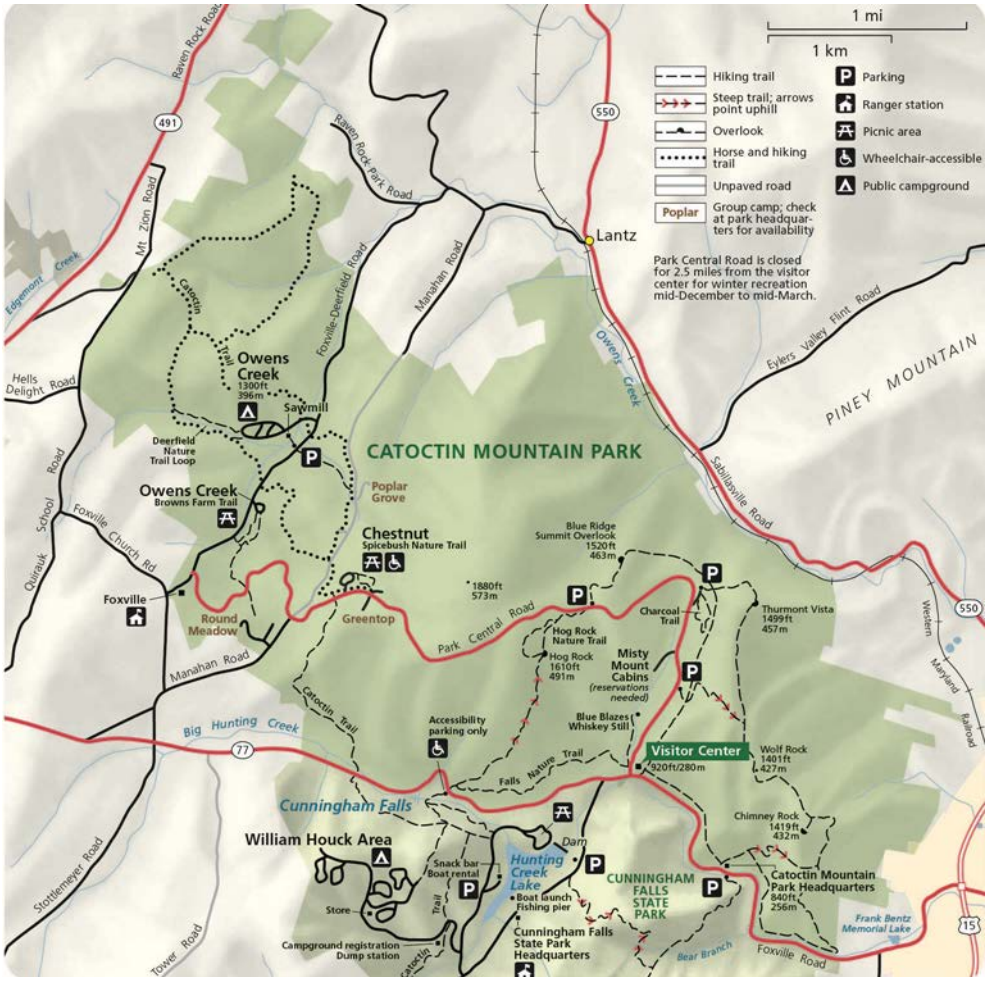
Catoctin Mountain Park encompasses 2,336 ha (5,770 acres) of forested landscape located in the mountains of the Catoctin Ridge in north-central Maryland. It originated as a Recreation Demonstration Area under the National Industrial Recovery Act of 1933, and was transferred to the National Park Service in 1936.

The park area has witnessed Native American use, European settlement for subsistence and commercial farming, iron production and other industry, tourism, recreational hunting, and military usage (both during the Civil War and World War II). In 1935, as part of a New Deal program to develop recreation areas near urban populations and address the problem of farmers working "submarginal land," the federal government began purchasing mountain land at Catoctin for a planned "recreational demonstration area." Catoctin Mountain was considered a top candidate for redevelopment because of its "good roads," proximity to the nearby Appalachian Trail, Hunting Creek (Wehrle 2000), and the cities of Washington and Baltimore.

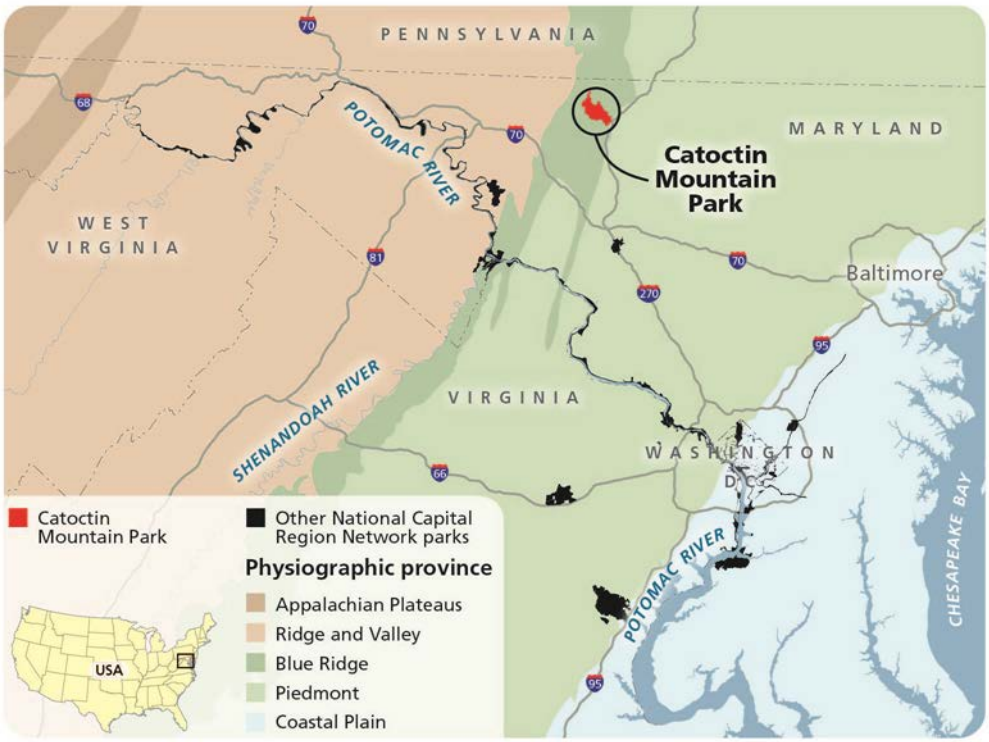
The purpose of Catoctin Mountain Park is to provide quality recreational opportunities in the Catoctin Mountains and serve as a setting and buffer for the Presidential Retreat, while protecting and conserving the park's natural and cultural environments as envisioned by New Deal conservation programs.

Catoctin Mountain Park is significant because it:

- Is an early and continuing example of conservation practices resulting in the regeneration of an Eastern deciduous forest;
- Provides outstanding scenic value at the transition of the Monocacy River Valley and the Catoctin Mountains in the Piedmont and Blue Ridge geologic provinces;
- Provides diverse outdoor recreation opportunities in a mountain setting near the population centers of the mid-Atlantic region;
- Provides pristine aquatic habitat for fishing and other recreational activities;
- Serves as a setting for the Presidential Retreat, Camp David, a place where international leaders convene to discuss world peace and international diplomacy;
- Was one of 46 Recreational Demonstration Areas established in the 1930s, and represents an outstanding example of New Deal Era programs to recast the landscape for recreation and conservation purposes;
- Is the location of the oldest operating cabin camps for the disabled in the nation, and is one of the original locations that the Office of Strategic Services trained, and hosted the Nation's first Job Corps Center; and
- Protects the cultural heritage of the Catoctin Mountains that dates back 3,500 years, ranging from stone tool making, to agriculture, to charcoal production.



Map of the Park



Location of the Park in North-Central Maryland

Chapter 2 - State of the Park

The State of the Park is summarized below for four categories—Natural Resources, Cultural Resources, Visitor Experience, and Park Infrastructure—based on a synthesis of the park's monitoring, evaluation, management, and information programs, and expert opinion. Brief resource summaries are provided below for a selection of the priority resources and values of the park. Clicking on the web ▸ symbol found in the tables and resource briefs below will take you to the internet site that contains content associated with specific topics in the report.

The scientific and scholarly reports, publications, datasets, methodologies, and other information that were used as the basis for the assessments of resource condition are referenced and linked throughout the report and through the internet version of this report that is linked to the NPS IRMA data system (Integrated Resource Management Applications). The internet version of each report, and the associated workshop summary report available from the internet site, provide additional detail and sources of information about the findings summarized in the report, including references, accounts on the origin and quality of the data, and the methods and analytical approaches used in data collection and the assessments of condition. Resource condition assessments reported in this State of the Park report involve expert opinion and the professional judgment of park staff and subject matter experts involved in developing the report. This expert opinion and professional judgment derive from the in-depth knowledge and expertise of park and regional staff gained from their being involved in the day-to-day practice of all aspects of park stewardship and from the professional experience of the participating subject matter experts. This expert opinion and professional judgment utilized available factual information for the analyses and conclusions presented in this report. This State of the Park report was developed in a park-convened workshop.

The status and trends documented in Chapter 2 provide a useful point-in-time baseline measured against reference conditions that represent "healthy" ecosystem parameters, or regulatory standards (such as those related to air or water quality). We also note that climate change adaptation requires us to continue to learn from the past, but attempting to manage for conditions based on our understanding of the historical "natural" range of variation will be increasingly futile in many locations. Thus, these reference conditions, and/or our judgment about resource condition or trend may evolve as the rate of climate change accelerates and we respond to novel conditions. Our management must be even more "forward looking," to anticipate plausible but unprecedented conditions, also recognizing there will be surprises. In this context, we will incorporate climate considerations in our decision processes and management planning as we consider adaptation options that may deviate from traditional practices.

2.1. Natural Resources

Air Quality

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Ozone	Annual 4th-Highest 8-Hour Concentration		The estimated ozone level from 2005–2009 at Catoctin Mountain Park was 75.9 parts per billion (ppb), which indicates a condition that warrants moderate concern based on NPS Air Resource Division benchmarks. However, at Catoctin Mountain Park the condition is elevated to "warrants significant concern" because the park falls within a county designated by the Environmental Protection Agency (EPA) as "nonattainment" (not meeting) for the ground-level ozone standard of an 8-hour average concentration of 75 ppb. A risk assessment concluded that plants in Catoctin Mountain Park were at high risk for ozone damage (Kohut 2007; Kohut 2004). No trend information is available because there is no on-site or nearby ozone monitor (NPS ARD 2013). List of ozone-sensitive plant species.
Deposition	Sulfur Wet Deposition		For 2005–2009, estimated sulfur wet deposition was 5.4 kilograms per hectare per year (kg/ha/yr), which warrants significant concern based on NPS Air Resource Division

			benchmarks. The park may be very highly sensitive to acidification effects (Sullivan et al. 2011a; Sullivan et al. 2011b) relative to all Inventory & Monitoring parks, including changes in water chemistry that impact aquatic vegetation, invertebrate communities, amphibians, and fish. No trend information is available because there is no on-site or nearby wet deposition monitor (NPS ARD 2013).
	Nitrogen Wet Deposition		For 2005–2009, estimated wet nitrogen deposition was 4.6 kilograms per hectare per year (kg/ha/yr), which warrants significant concern based on NPS Air Resource Division benchmarks. No trend information is available because there is no on-site or nearby wet deposition monitor (NPS ARD 2013).
Visibility	Haze Index		For 2005–2009, estimated average visibility was 13.0 deciviews (dv) above natural conditions, which warrants significant concern based on NPS Air Resource Division benchmarks. For 2005–2009, visibility at the monitoring site representing Catoctin Mountain Park improved both on the 20% clearest days and 20% haziest days (NPS ARD 2013).

Geologic Resources

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Catoctin Mountain Park is part of the Appalachian Mountains, one of the oldest mountain ranges in the world. Catoctin Mountain is the easternmost range within the northern end of the Blue Ridge Province, which makes up the core of the Appalachians. The park is situated on the eastern limb of the Blue Ridge-South Mountain anticlinorium, a series of folded geologic structures grouped together in the general outline of an arch. The Catoctin Mountain ridge extends 80 km (50 mi) in a discontinuous line from Emmitsburg, Maryland southwest to Leesburg, Virginia. The mountains range from 3 to 6 km (2 to 4 mi) wide in Maryland to less than 1.6 km (1 mi) wide in Virginia. Rocks in Catoctin Mountain Park are composed of Lower Paleozoic sediments and older metamorphosed volcanic rocks, ranging in age between one billion and 480 million years old. Immediately east of Catoctin Mountain Park is a fault boundary between the Blue Ridge and Piedmont provinces. These two very different geologic terranes were juxtaposed about 300 million years ago during a collision of tectonic plates, which uplifted the mountains visible today. Much later, during the last ice age about 11,000 years ago, Catoctin Mountain was subjected to a much colder, wetter climate that tore the rocks apart by frost weathering, creating the large talus slopes that now exist in the park. The term “catoctin” is used by geologists to describe a ridge of resistant rocks rising above an erosional surface that preserves an older erosional surface on its summit. The term was named after Catoctin Mountain. Soils on the eastern slope of Catoctin Mountain within and surrounding the park are acidic, thin, sandy loams with high permeability, and support chestnut oak and pitch pine. In contrast, soils typical on the western side of the park, are deeper and more moist, orange, clayey, and rich in calcium and magnesium. They can support a wider variety of tree species, including sugar maple, basswood, hickories, white ash, beech, and tulip poplar. These dissimilarities in soils, controlled by the parent rock type, cause differences in the distribution of vegetation. There are no known or documented paleontological resources in the park. The USGS classifies the Catoctin Mountain area as having low seismic risk. Learn More.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Fluvial Features and Processes	Rate of stream bank erosion and deposition Changes in channel morphology		Erosion and sedimentation in the park’s creeks and drainages appear to be operating at a natural rate (Deborah Slawson, personal communication 6/25/2010). Some drainages may be more susceptible to erosion (Whiskey Still Creek) or sedimentation (Owens Creek) than others (Slawson 2010) and the park has introduced a number of measures to ensure bank stability including log frame deflectors, jack dams, stone riprap, and log dams.

Cave and Karst Features and Processes	Amount of human access and utilization.		Two tectonic caves are located in the park. Karst is not present. Little else is known.
Mountain Slopes	Frequency of slope movements as indicated by debris flow scars, arcuate landslide features, evidence of rockfalls, and requests by park staff for technical assistance.		Natural slope processes are operating unimpaired in the park, where most slopes are at 25% or less. There are no obvious debris flow scars, no arcuate landslide features, and no Technical Assistance Requests from the park for slope related issues. Slope stability will trend towards a natural state as the forest structure recovers from local logging history. However, rockfall risk is possible in some areas and should be addressed in the visitor experience or park infrastructure sections of this report.
Soil Quality	Percentage of park land classified by the Soil Resources Inventory as eroded. Changes in type of soil cover		Soil resources may be threatened by accelerated erosion resulting from trail construction and use. However, current trail use in the park does not constitute a major threat to soil resources and therefore is not considered in determination of the Condition Status/Trend symbol.

Water Quantity and Quality – Owens Creek

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Chemistry	pH		All 644 measurements of pH in the Owens Creek drainage between 2000 and 2011 were within the 6.5 to 8.5 range designated by MD as the standard for trout streams (Thomas et al. 2013).
	Dissolved Oxygen		Only 4 of the 621 measurements of Dissolved Oxygen in Owens Creek between 2000 and 2011 were below the 5.0 mg/l level designated by Maryland for Nontidal Cold Water and Public Water Supply (Thomas et al. 2013).
	Water Temperature		11 of the 555 measurements of water temperature in Owens Creek between 2000 and 2011 were above the reference condition of 20°C (Thomas et al. 2013), with 7 of those 11 high temperatures occurring in 2010 and 2011.
	Specific Conductance		24 of 610 (3.9%) measurements of Specific Conductance between 2000 and 2011 were above the 171 µS/cm threshold for impacts on fish in Maryland (Morgan et al. 2007, Thomas et al. 2013).
	Acid Neutralizing Capacity		All measurements were above the 200 µeq/L minimum as recommended by the Maryland DNR.
	Nitrates		4 of the 68 measurements of nitrates in Owens Creek during 2005–2011 exceeded the 2.0 mg/L reference condition used by Southerland et al. (2007) and Norris and

			Pieper (2010).
	Phosphates		Total Phosphorus levels in Owens Creek between 2007 and 2011 were very high, with all 52 measurements exceeding the maximum 0.01 mg/L recommended by the EPA for nutrient ecoregion XI (Thomas et al. 2013). A minor increase in phosphorus concentration can significantly affect water quality by changing the population and community dynamics of algae and diatoms leading to eutrophication (Allan 1995).
Aquatic Macroinvertebrates	Benthic Index of Biotic Integrity		This index developed by the Maryland Biological Stream Survey is an indicator of the health of the benthic macroinvertebrate community in a stream. The Owens Creek site had an index value of 4.33 in 2010, which is evaluated as being in Good condition.
Physical Habitat Index	Physical Habitat Index		The Physical Habitat Index for Owens Creek was 72 in 2010, which is rated as Partially Degraded using criteria from the Maryland Biological Stream Survey (Paul et al. 2003, Southerland et al. 2005).
Streamflow	Number of days that stream flow is less than 1.5 cubic feet/sec		The park has a Memorandum of Understanding with the State of Maryland that requires a minimum flow rate of 1.5 feet3/sec. The minimum streamflow that brook trout can tolerate depends on other related factors such as water temperature, sedimentation, and physical habitat. The NCRN I&M network has recently increased monitoring efforts to characterize flow rates in the creek.

Water Quantity and Quality – Big Hunting Creek

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Chemistry	pH		Only 3 of the 523 measurements of pH in the Big Hunting Creek drainage between 2000 and 2011 were outside of the 6.5 to 8.5 range designated by MD as the standard for trout streams (Thomas et al. 2013).
	Dissolved Oxygen		Only 3 of the 496 measurements of Dissolved Oxygen in Big Hunting Creek between 2000 and 2011 were below the 5.0 mg/l level designated by Maryland for Nontidal Cold Water and Public Water Supply (Thomas et al. 2013).
	Water Temperature		16 of the 679 measurements of water temperature in Big Hunting Creek between 2000 and 2011 were above the reference condition of 20°C (Thomas et al. 2013), with 9 of those 16 high temperatures occurring in 2010 and 2011.
	Specific Conductance		118 of 492 (24%) measurements of Specific Conductance between 2000 and 2011 were above the 171 µS/cm threshold for impacts on fish in Maryland (Morgan et al.

			2007, Thomas et al. 2013).
	Acid Neutralizing Capacity		All measurements between 2000 and 2011 were above the 200 µeq/L minimum as recommended by the Maryland DNR.
	Nitrates		Only 1 of 134 nitrates measurements in Big Hunting Creek during 2005–2011 exceeded the 2.0 mg/L reference condition used by Southerland et al. (2007) and Norris and Pieper (2010).
	Phosphates		Total Phosphorus levels in Big Hunting Creek between 2007 and 2011 were very high, with all 104 measurements exceeding the maximum 0.01 mg/L recommended by the EPA for nutrient ecoregion XI (Thomas et al. 2013). A minor increase in phosphorus concentration can significantly affect water quality by changing the population and community dynamics of algae and diatoms leading to eutrophication (Allan 1995).
Aquatic Macroinvertebrates	Benthic Index of Biotic Integrity		This index developed by the Maryland Biological Stream Survey is an indicator of the health of the benthic macroinvertebrate community in a stream. The 3 sites in the Big Hunting Creek drainage had index values of 4.00, 4.33, and 4.67, which are evaluated as being in Good condition.
Physical Habitat Index	Physical Habitat Index		The Physical Habitat Index for three sites in the Big Hunting Creek drainage were 48, 65, and 67, which are rated as Severely Degraded to Partially Degraded using criteria from the Maryland Biological Stream Survey (Paul et al. 2003, Southerland et al. 2005).
Streamflow	Number of days that stream flow is less than 1.5 cubic feet/sec		The park has a Memorandum of Understanding with the State of Maryland that requires a minimum flow rate of 1.5 $feet^3$/sec. The minimum streamflow that brook trout can tolerate depends on other related factors such as water temperature, sedimentation, and physical habitat. The NCRN I&M network has recently increased monitoring efforts to characterize flow rates in the creek.

Eastern Deciduous Forest

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Forest Cover	Percent cover (satellite imagery and aerial photography)		95% of the area within the park is forested, and 75% of the area within a buffer that is five times the size of the park is forested (Monahan et al. 2012, Thomas et al. 2013).
Alien Understory Species	Percentage of forest monitoring plots with alien species in the		Alien herbaceous plants were found in 69% of forest monitoring plots (Schmit et al. 2012a).

	understory		
	Percent cover of Japanese stiltgrass		Japanese stiltgrass (*Microstegium vimineum*) covers 14% of the park (Schmit et al. 2012a).
	Percent Cover of Japanese barberry		Japanese barberry (*Berberis thunbergii*) covers 2.1% of the park (Schmit et al. 2012a).
Alien Trees and Saplings	Percent Cover		Condition for basal cover of alien trees and saplings in CATO was very good, with 100% of plots attaining the reference condition of ≤ 5% of total basal area (Schmit et al. 2012a). Trend analysis was not possible.
Forest Pest Species	Number of serious pest species (e.g. gypsy moth *Lymantria dispar*)		29.7% of all trees monitored at CATO were infested with a serious insect pest between 2006 and 2009 (Schmit et al. 2012a).
Native Species	Number of state-listed rare, threatened and endangered species		28 species that are listed by the State of Maryland as rare, threatened, endangered, or watch-list species are known to occur in the park (Schmit et al. 2012b).
Tree Seedling Regeneration	Seedlings per hectare		CATO has the lowest rate of tree seedling generation among 39 national parks in the Northeast and National Capital regions between Virginia and Maine. Native seedling regeneration at CATO was 398 per hectare in 2006–2009 (Schmit et al. 2012b). Only one 1 of 49 plots has adequate forest stocking based on the standard adopted by the park (Stout 1998) for deer management.

Fish Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Fish Index of Biotic Integrity	Fish Index of Biotic Integrity (IBI)		The median Fish Index of Biotic Integrity for four stream sites at CATO in 2006 and 2010 was 3.8, which is rated as Fair based on the criteria of Southerland et al. (2007).
Brook Trout	Standing stock: Total biomass (kg/ha) Adult trout abundance (trout/ha) Young of Year (YOY)		Three measures of the abundance of brook trout were evaluated using data from Maryland DNR and the NCRN I&M network. The 33rd and 66th percentiles were calculated for each of 3 sites based on data collected from 1989 to 2011. 3-year averages were calculated for each site based on 2009 and 2011 data, which were then compared to the percentiles. 3-year averages below the 33rd percentile were poor, between the 33rd and 66th percentiles were fair, and above the 66th percentile were good. Site — kg/ha — trout/ha — YOY/ha Owens Camp — Good — Poor — Fair Owens Lower — Fair — Fair — Fair

			BHC Headwaters Fair Poor Poor

Wildlife Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Bird Communities	Species Richness		The NPSpecies certified bird list for CATO documents 164 bird species in the park.
	Bird Community Index (BCI)		The 2011 BCI at CATO showed medium integrity, with a mean of 52.06. BCI scores have been remained stable at CATO over the past five years (Ladin and Shriver 2013); (O'Connell et al. 1998).
White-tailed Deer	Deer density (number per square mile)		Estimated deer density in 2010 was 87 deer per square mile. See graphic below.
Reptiles and Amphibians	Species richness		Seventeen (17) species of amphibians and 13 species of reptiles have been documented at CATO. (NPSpecies certified list, Pauley et al. 2005).
	Rattlesnake abundance		The estimated rattlesnake abundance at the park is 218–239 rattlesnakes, based on field work conducted by a permitted researcher (W. H. Martin 2013). Encounters by park visitors with timber rattlesnakes are rare due to the snake's shy and elusive behavior.

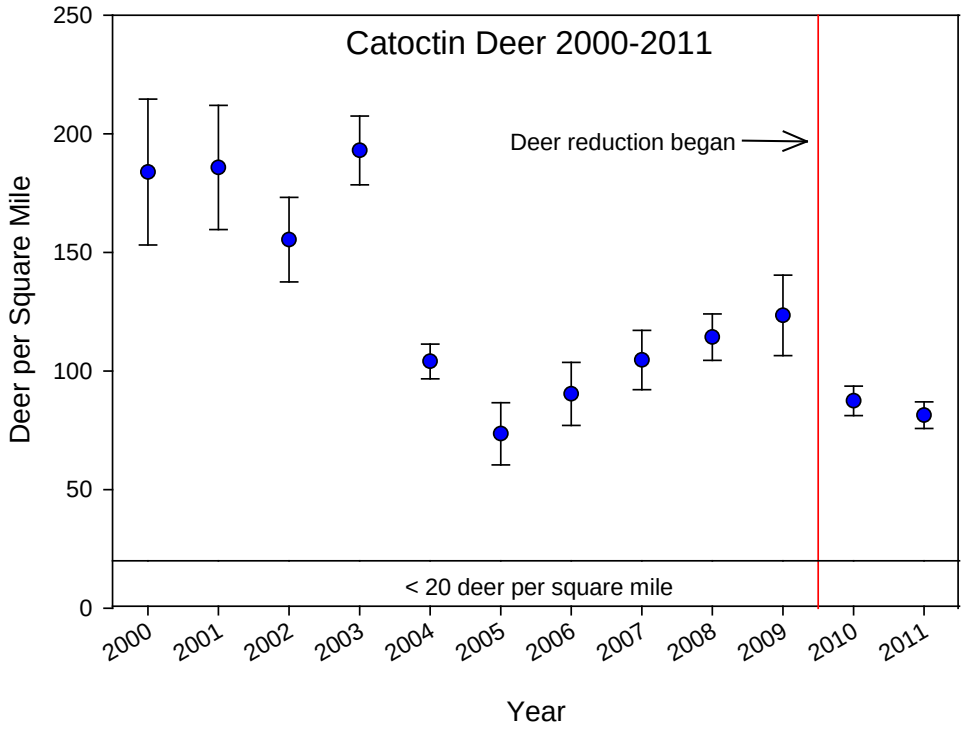
Resource Brief: White-tailed Deer and Native Seedling Regeneration

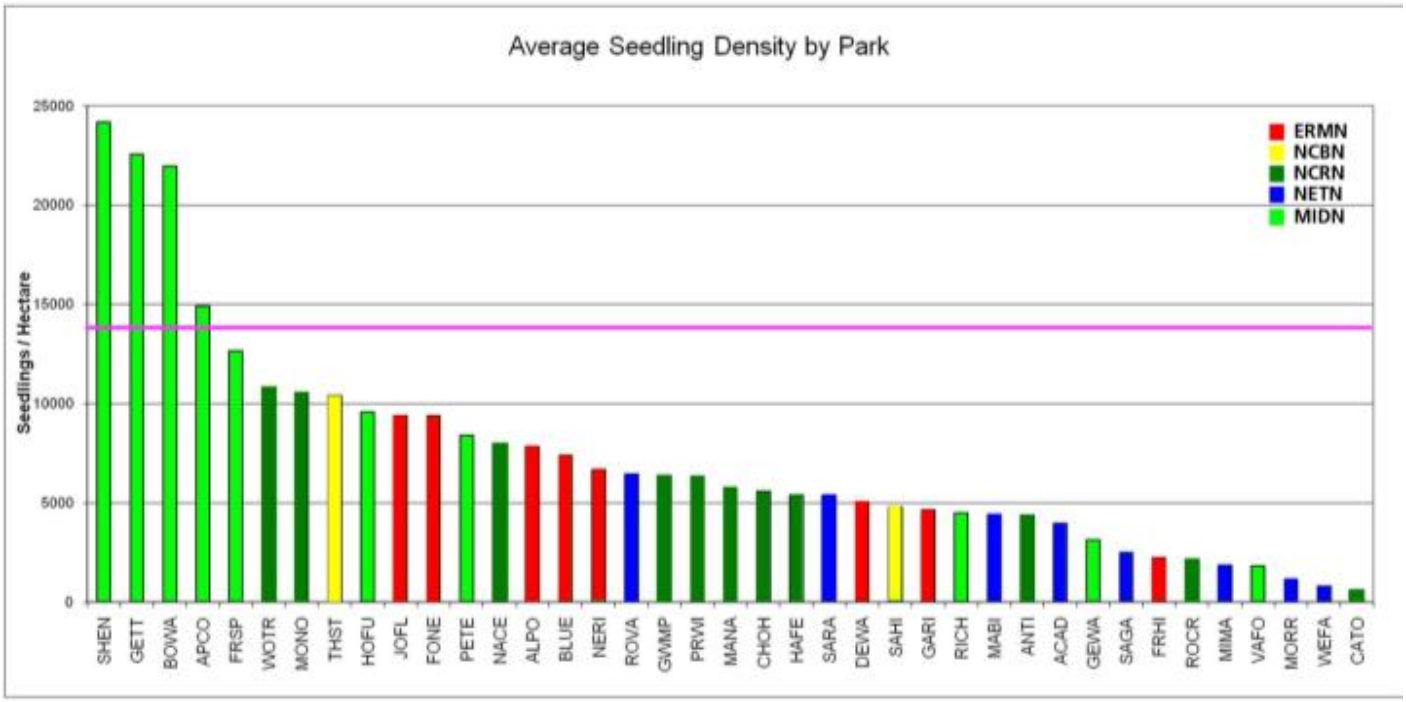
Extremely rare at the turn of the 20th century, white-tailed deer populations in Maryland have not only rebounded, but now number more than at any other time in their history. Deer have adapted to landscape-level changes such as alteration and changing land use patterns associated with suburban development (Maryland Department of Natural Resources [MDNR] 1998). Deer thrive on habitat conditions created by suburban development, as new roads, housing, and related enterprises fragment forests and farms, creating "edge" habitat that provides plenty of food. Protection and shelter are found in landscapes such as Catoctin where hunting is prohibited. Increases in agricultural productivity have also increased availability of nutritious foods for deer. Concurrently, habitat fragmentation, along with changing social habits (the number of hunters has steadily decreased since the 1980s), have resulted in reduced hunting pressure, particularly in Maryland's growing suburban areas (MDNR 1998).

When Catoctin Mountain Park was established in 1936, it is likely that no white-tailed deer existed within its boundaries. In the 1970s problems related to an overabundance of deer were suspected. Park staff first raised the issue of adverse impacts from deer browsing in the early 1980s because it could cause a long-term decline in both the abundance and diversity of native plant species. The park's 1988 Resource

Management Plan mentions concerns about the potential loss of long-term forest regeneration, changes in water quality that might arise from the loss of vegetation, and the potential transmission of disease and parasites from deer to humans.

Through the 1990s park staff conducted a number of monitoring studies to document the size of the deer population, as well as plant growth occurring in the understory of the mature forest canopy. Generally, data collected by park staff and researchers indicated that forest regeneration was nearly absent within the majority of the park, due in large part to high deer numbers. Park staff has coordinated with several technical experts and researchers to develop methods and protocols for monitoring deer population size and forest regeneration within the park. As a result, it was determined that the park's current deer management plan needed to be revised.





Landscape Dynamics

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Forest Cover	Percent of area within park and within the area five times larger than the park that is covered by forest.		95% of the area within the park is covered by forest, and 75% of the area within a buffer that is five times the size of the park is forested (Monahan et al. 2012, Thomas et al. 2013).
Impervious Surface	Percent of area within park and within the area five times larger than the park that is covered by impervious surfaces.		Only 0.2 % of the area within the park, and 2.9% of the area within a buffer that is five times the size of the park, is covered by roads and parking areas and other impervious surfaces (Monahan et al. 2012, Thomas et al. 2013).
Road Density	km of road per square kilometer of area.		Road density within the park is 1.3 km/km2, which is very good based on (NRCA 2012), but the road density within the buffer that is five times the size of the park is 2.2 km/km2, which is considered degraded (Monahan et al. 2012, Thomas et al. 2013).

2.2. Cultural Resources

Archeological Resources

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Completeness of Inventory	Percentage of archeological sites entered into Archeological Sites Management Information System (ASMIS)		100% of the known archeological sites (currently 131 sites) are listed in ASMIS. References: The Louis Berger Group, Inc. 2011; Scott Colby 1992; ASMIS
Completeness of Documentation	Percentage of parkwide archeological survey coverage for areas with high potential for archeological sites		100% survey coverage has been completed for park areas with high probability for archeological sites (this translates to 43% of the park). More survey and inventory is needed on a selective basis for future projects or other ground-disturbing activities. References: The Louis Berger Group, Inc. 2011; Scott Colby 1992; ASMIS
Site Condition	Percentage of sites in GOOD condition, as noted in Archeological Sites Management Information System (ASMIS)		100% of the archeological resources listed in ASMIS are in GOOD condition.

Cultural Anthropology

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Completeness of Documentation	Completed percentage of documentation of people with traditional associations the with New Deal Programs (WPA and CCC) at the Catoctin RDA		Documentation is 25% complete based on the number of interviews and social history reports at the park. There is no ethnographic overview or systematic understanding of information. Some information exists, but needs transcription and analysis of the respondents' interviews for potential identification of ethnographic resources.
	Completed percentage of documentation of people with traditional associations with WWII period (OSS activities, Presidential Retreat – Hi-Catoctin)		Documentation is 10% complete based on the number of interviews and social history reports at the park. There is no ethnographic overview or systematic understanding of information.
	Completed percentage of documentation of camp users from 1930s to present, and their traditional associations at the park.		Documentation is 25% complete based on the number of interviews and social history reports at the park. There is no ethnographic overview or systematic understanding of information. Potential groups and camp users that may identify associated ethnographic resources include League for People with Disabilities, Frederick County Outdoor School, Latter Day Saints, scouting group, and others (Wehrle 2000).
	Completed percentage of documentation of pre-park groups with traditional associations (land owners, early tourism, mushroom and morel gathering as cultural foodways, and other yet-to-be-identified groups.		Documentation is 20% complete. There is a study of morel gathering at CATO: Barron, E.S and M.R Emery. 2009. "Protecting Resources: Assessing Visitor Harvesting of Wild Morel Mushrooms in Two National Capital Region Parks. Natural Resource Technical Report NPS/NCR/NCRO/NRTR–2009/002. More information regarding the breadth of these potential resources is needed to determine future activities.
	Completed percentage of documentation of people with traditional associations with the Job Corps Center period at Catoctin.		Documentation is 5% complete. This information is based on availability of personnel records, videos, and photographs at the park.
Ethnographic Resource Condition	Condition of ethnographic resources, based on professional opinion in coordination with		Resource condition of potential ethnographic resources is unknown for all resource types because they have not yet been identified. After ethnographic resources are identified, the resource condition will be assessed and monitored. No Servicewide ethnographic condition database exists (the

	condition assessments included in other resource databases.		NPS Ethnographic Resources Inventory (ERI) is currently not supported).

Cultural Landscapes

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Completeness of Documentation	Completed percentage of Cultural Landscape Inventory database		Cultural Landscape Inventory is less than 33% complete because two of the six potential cultural landscapes, parent or component, have been documented in the Cultural Landscape Inventory database. The parent cultural landscape inventory for the Catoctin Mountain Park cultural landscape is complete (NPS 2008), and the cultural landscape inventory for one component landscape, Camp Misty Mount, is complete (NPS 2006). The Camp Greentop component landscape still needs to be documented in a cultural landscape inventory. Additionally, three potential component landscapes, Camp Round Meadow, the Braestrup Tract, and Mission 66 areas (Owens Creek Area & Chestnut Area), might need cultural landscape inventories if a pre-evaluation of these areas determines that cultural landscape inventory documentation is necessary. The Misty Mount Cultural Landscape Inventory may also need to be updated to include Mission 66 features.
Documented Condition Assessments	Cultural Landscape Inventory condition assessment		The Catoctin Mountain Park parent cultural landscape is in FAIR condition; the Camp Misty Mount component landscape is in GOOD condition. However, not all component landscape conditions have been documented or assessed for condition.
Views and Vistas – Completeness of Documentation Contributing to the Cultural Landscape	Cultural Landscape Inventory condition assessment		Cultural Landscape Inventory documentation of views and vistas is less than 33% complete overall because two out of six identified and potential cultural landscapes, parent or component, have cultural landscape inventories that identify views and vistas.

Historic Structures in Camp Greentop and Camp Misty Mount

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Completeness of Documentation	1. Completed % of List of Classified Structures (LCS) database 2. Completed % of National Register		1. LCS database is 100% complete for the historic structures in Camp Greentop and Camp Misty Mount 2. National Register nomination for Camp Greentop and Camp Misty Mount is 100% complete (NPS 2012) 3. 0% complete: Historic structures at Camp Greentop

	Nominations and determinations of eligibility for all potentially eligible structures 3. Completed % of Historic Structures Reports (HSRs) for all historic structures		and Camp Misty Mount do not have historic structure reports or historic structure assessment reports
Assessment of Condition	List of Classified Structures (LCS) Condition Assessment (GOOD, FAIR, POOR)		Of the 64 structures Camp Greentop and Camp Misty Mount, 51 (79%) are assessed to be in GOOD condition, 11 (17%) are in FAIR condition, and 2 (3%) are in POOR condition. The park is able to repair/stabilize cabins at a rate of only approximately one cabin per fiscal year, but the need is greater.

Other Historic Structures

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Completeness of Documentation	1. Completeness of List of Classified Structures (LCS) database 2. Completeness of National Register Nominations and Determinations of Eligibility (DOE) for all potentially eligible structures 3. Completeness of Historic Structures Reports (HSRs) for all historic structures		1. LCS database is 100% complete. Note: the LCS may need to be updated if buildings and structures at Braestrup Tract and Mission 66 areas (Owens Creek Area & Chestnut Area) are found to be National Register-eligible. 2. The National Register nomination for other historic structures is 100% complete, per 2012 nomination. 3. 0% complete: none of the other historic structures have historic structure reports
Assessment of Condition	List of Classified Structures (LCS) Condition Assessment (GOOD, FAIR, POOR)		Of the 3 other historic structures listed in the List of Classified Structures, 2 (66%) are in GOOD condition and 1 (33%) is in FAIR condition. However, at least six other historic structures need to be included in the List of Classified Structures (LCS) and assessed for condition. This includes structures at Braestrup Tract and Mission 66 areas (Owens Creek Area & Chestnut Area) that were found National Register-eligible but are not yet entered into the LCS.

Museum Collections

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Museum Facility Condition	Percentage of the annual Interior Collection Management System (ICMS) facility checklist standards met		82% of the ICMS checklist standards are currently being met. Facility conditions are inadequate because the room containing the collection is not climate controlled.
Completeness of Inventory	1. Percentage of objects catalogued 2. Percentage of automated checklist for all annual reporting requirements met		1. 100% of objects are catalogued, except for archeological artifacts recently obtained by the park. Backlog is minimal, consisting of archival objects (photographs, drawings, transcripts, interview transcripts). Accessioning process is static, stable. Large amount of new items expected to expand the collection in the future. 2. 100% of annual reporting requirements have been met
Collection Condition	Percentage of archeological artifacts that meet the condition standards in the Interior Collections Management System (ICMS)		100% of the archeological artifacts (stored at MRCE) are in GOOD condition.
	Percentage of natural resource specimens that meet the condition standards in the Interior Collections Management System (ICMS)		100% of the natural resource specimens stored at the park museum at the Visitor Center are in poor condition because they are affected by the building's uncontrolled environment.
	Percentage of historical resources that meet the condition standards in the Interior Collections Management System (ICMS)		100% of historical resources in the collections meet the standard for GOOD condition.
	Percentage of archival resources that meet the condition standards in the Interior Collections Management System (ICMS)		The percentage of archival resources that meet ICMS standards for condition is not known because the majority of the archival resources has not been accessioned or evaluated.

2.3. Visitor Experience

Number of Visitors

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of Visitors	Number of Visitors		The number of visitors to Catoctin in 2012 was estimated at 263,797, which was about half of the mean annual visitation (496,874) for the 10-year period of 2002–2011 (NPS Public Use Statistics). Visitor numbers are affected by weather (rain or snow), park closures, and the local and regional economy. 150th anniversary of Civil War could cause a decline in CATO visitation, as it is not a battlefield park. There are many repeat visitors from year to year.

Visitor Satisfaction and Safety

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Visitor Satisfaction	Percent of visitors who were satisfied with their visit		Based on the standardized visitor satisfaction survey that is conducted each year, the percent of visitors who said they were satisfied with their visit to CATO in 2008 through 2012 was 100%, 92%, 98%, 95% and 100%, for an average of 97.0% of visitors satisfied.
Accessibility	Number of accessible facilities and trails		Accessible sites within park include three camping sites, two picnic sites, six rest rooms, the majority of cabins at Camp Greentop, one at Camp Misty Mount, and multiple facilities at Camp Round Meadow. In addition, the park helped develop accessible fishing access site in adjacent state park. Visitor Center is accessible but Park Headquarters is not. Braille brochures and audio recordings have also been produced. Excellent feedback from visitors on improvement. Good progress; however, more work remains.
Visitor Safety	Proactive measures		Visitors need permit for rock climbing; volunteer groups are briefed on safety. Signs and park brochure warn of possible hazards. Safety briefings are conducted as part of all interpretation and education programs. All park law enforcement rangers are at least first responders. 40% of entire staff is trained in CPR and AED; three EMTs on staff. Excellent response times with nearby fire/EMS companies. There is a very high safety perception by visitors (visitor use study).
	Number of incidents		The number of reported visitor injuries or incidents is low, with an incident rate of 2 per 100,000 visitor days.

Education and Outreach Programs

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Education programs (in partnership with schools)	Number of programs		The number of educational programs provided by staff at Catoctin has increased over the past five years based on Servicewide Interpretive Reports, but the number of programs provided is highly sensitive to budget constraints and the ideal number of programs has not been attained. School teachers and park staff are at the limit of their resources, e.g., transportation, fuel expenses, teacher time, field trip logistics (Long Range Interpretive Plan).
	Attendance		Attendance numbers are increasing, based on Servicewide Interpretive Reports. More emphasis has been placed on school programs since 2010, based on personnel and management focus.
Outreach programs	Number of programs		Outreach programs include roving interpretation inside the park as well as programs and presentations in the community. The park has placed greater emphasis on outreach since 2010 and the number of programs continues to grow.
	Attendance		Number of persons participating in or attending outreach programs has increased by approximately 30% since 2007.
Ranger programs	Number of programs		The number and variety of programs has increased approximately 60% since 2007, with the greatest increase between 2010 and 2011.
	Attendance		Program attendance is increasing, with participation up approximately 38% in 2011 compared to the previous five-year average.
Interpretive Media	Waysides and bulletin board		All CATO waysides are less than five years old (Long Range Interpretive Plan).
	Publications		New park brochure was produced in 2010. 75th Anniversary newspaper was produced in 2011 (in conjunction with Prince William Forest Park); Hiking Challenge handouts produced and distributed; new Junior Ranger publication for Visitor Center completed in 2010; Junior Ranger publication for Camp Misty Mount was completed in 2012.
	Electronic media		Park website: geology content updated in 2011; upcoming interactive Junior Ranger feature will be posted in 2012. Facebook, Flickr, and Twitter pages all created in 2011. Moderate activity in social media but difficult to keep pace due to technical knowledge and staff time required.

	Exhibits		Visitor Center exhibit, whiskey still, and collier huts all need updating and refurbishing. Some repairs performed on Sawmill in 2011, but still require attention. Refurbishing is part of Long Range Interpretive Plan.

Recreational Opportunities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Camping	Campground, Adirondack shelters, cabin camping registration numbers		Trends are slowly decreasing based on visitor counts and campsite registrations and receipts. Several sites have recently been made available on the national recreation reservations system (www.recreation.gov). Downward trend could be related to overall decrease in outdoor recreation nation-wide.
Trails	Usage of trails for hiking, horseback riding, skiing		Catoctin Mountain is a key location for connecting to other trails on adjacent public land.
Fishing	Number of anglers		Approximately 4–5% of visitors use the park for fishing (visitor use study). CATO numbers reflect overall national trends.
Mushroom and berry gathering	Number of gatherers		Morel hunting is a valued activity for many visitors to National Capital Region parks (visitor use study, Barron and Emery 2009).
Scenic Driving	Number of cars counted		The percentage of visitors who come to the park for scenic driving is based on an evaluation of NPS visitor use statistics and data from the visitor use study.
Wildlife Viewing	Number of visitors in park to view wildlife		Based on the visitor use study, deer and birds are the wildlife most commonly mentioned by visitors for wildlife viewing.
Picnicking	Number of visitors in park for picnicking		Specific picnic areas are used within the park, primarily on weekends. Several picnic facilities are closed more frequently and some have been downsized. The decrease in use may be part of national trend of overall decrease in outdoor recreation.
Photography	Number of visitors in park for photography		Photography was included as a category in the visitor use study; the trend appears to be stable.

Natural Landscape Experience

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Views and Overlooks	Increasing population density as determined by dwellings /acre.		Park viewsheds have been mapped and a viewshed analysis needs to be completed. Park is regularly engaged and involved with neighboring landowners, developers, and local governments regarding potential development.
	Trail count data		The park needs to understand the number of visitors that visit overlooks. Visible development outside of park boundaries may be reducing the use of overlooks as visitor destinations.
	Width of the viewing angle as determined by repeated photopoint studies		This is currently measured according to the degree of clarity of sight lines at selected overlooks, such as Chimney Rock, Hog Rock, Thurmont Vista, and Blue Ridge Summit.
Night Skies	Measurements of the dark night sky		Dark sky was identified as an important park resource by those interviewed in the visitor use study. CATO is one of the darker areas in the broader urban area, but baseline night sky measurements are needed. Lighting in the park is being modified to include shields and motion sensors to reduce light pollution.
Natural Sounds	Natural sound levels		Baseline natural sound measurements are needed. Natural sounds were identified as an important park resource by those interviewed in visitor use study. Traffic sounds are audible from most areas within park, especially traffic near Maryland Route 77. Only a few valley areas are out of range from highway noise.

Volunteers and Partnerships

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Volunteer Numbers	- Number of volunteers - Volunteer hours		A five-year average of 1,082 volunteers during 2008–2012 contributed an average of 13,856 hours of service per year at CATO (source: Annual Volunteer Report). The number of volunteers and volunteer hours in 2012 was higher than previous years, but the condition warrants concern because the park has limited resources available to fully benefit from all of the volunteer possibilities.
Partnerships and permits	Number of partnerships		The park engages in a wide range of formal and informal partnerships. Many partnerships are short-term and event-focused; others repeat regularly. Streamlined partnership procedures and templates (NPS-wide) would make collaboration easier.

	Number of research permits issued		The 18 research permits issued by the park in 2012 for research affiliated with universities or other academic institutions, is consistent with the 5-year average of 17.8 permits. Some research is ongoing and covers multiple years, whereas other projects are short-term. (Source: NPS Research Permit and Reporting System).
	Number of special use permits issued		Includes recreational and non-recreational uses. Permits require meeting certain conditions and Superintendent's approval. Can also involve an administrative fee and other fees to cover any park oversight that might be required.

2.4. Park Infrastructure

Overall Facility Condition Index

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The National Park Service uses a facility condition index (FCI) to indicate the condition of its facilities and infrastructure. FCI is the cost of repairing an asset, such as a building, road, trail, or water system, divided by the cost of replacing it. The lower the FCI number, the better the condition of the asset. The condition of the buildings and other infrastructure assets at each park is determined by regular facility inspections, or "condition assessments", including daily informal inspections and formal yearly inspections. Deficiencies identified from these assessments are documented in the NPS Facility Management Software System and the cost for each repair determined. Repairs that cannot be completed within the year count against the condition of a structure. The total cost of these deferred repairs divided by the total cost to replace the structure results in the FCI, with values between 0 and 1 (the lower the decimal number, the better the condition). The FCI is assigned a condition category of Good, Fair, Poor, or Serious based on industry and NPS standards. Deferred maintenance projects that require additional funding are identified based on FCI. Planned preventive maintenance on critical components occurs during the year, using a park's base budget. For additional information about how park managers use information about the condition of facilities and infrastructure to make decisions about the efficient use of funding for maintenance and restoration activities at the park, Click Here.

Asset Category	Number of Assets 2008 / 2012	FCI 2008 / 2012	Condition Status/Trend	Rationale
Buildings	146 / 143	0.148 / 0.109		28 of the park buildings are in poor or serious condition, and the park has submitted funding requests to repair or rehabilitate them. The roofs have recently been replaced for nine of the historic Misty Mount cabins. A new fire suppression system was installed in law enforcement housing. Outdoor lighting in the Camp Misty Mount parking area and other areas of the park has been improved to include motion sensors and better orientation of lights to improve energy usage and to reduce light pollution as part of the NPS night sky initiative.
Campgrounds	1 / 8	0.000 / 0.001		Hazard trees have been removed along roadways and in camping areas for visitor safety. The park is in the process of re-routing the entrance to the Walnut Springs campground to avoid a wetland area. Improvements are needed for some of the comfort stations to make them ADA accessible.
Trails	18 / 18	0.299 / 0.139		The Spicebush Trail was recently renovated by volunteers from Job Corps in partnership with the park. The trail surface, which was in poor condition, was removed and replaced with wood

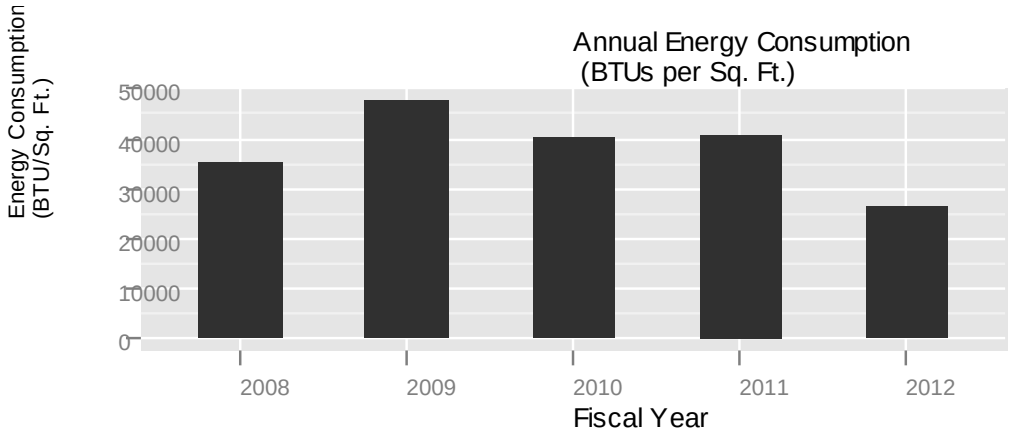
				carpet material to make it accessible to visitors with disabilities. Volunteer groups have been helping to remove overgrowth of barberry shrubs in remote areas of the park. Trail signs have been recently improved.
Waste Water Systems	10 / 10	0.226 / 0.267		The wastewater system at Greentop, which previously had a leach field, was recently hooked up to the municipal wastewater treatment plant. The park has been monitoring wastewater piping and has been replacing components as needed.
Water Systems	9 / 9	0.313 / 0.096		The park has an aging water-delivery system and is replacing valves and other components as possible to keep it functioning. The pump was recently replaced in the Blueblazes pump house, and the park is planning to replace the Ike Smith pump house this year.
Unpaved Roads	6 / 7	0.285 / 0.003		Unpaved roads are maintained yearly or after extreme weather events.
Paved Roads, Parking Areas, Bridges, Tunnels	35 / 34	0.070 / 0.112		Improvements will be made to the Foxfield road this year including resurfacing and improvements to drainage. Plans are being made to reconfigure the Owens Creek picnic parking area to improve its layout and size, and to replace the comfort station with one that reduces utility costs and maintenance needs.
All Others	29 / 32	0.254 / 0.115		Included in this category are the park's radio and telephone systems, electric supply system, fuel system, wayside exhibits, and picnic areas and grounds.

Energy Consumption

web

The production of energy to heat, cool, and illuminate buildings and to operate water utility systems is one of the largest contributors to greenhouse gas emissions in the United States. The National Park Service is committed to improving facility energy performance and increasing its reliance on renewable energy sources. The National Park Service has a goal to reduce Servicewide building energy consumption per square foot of building space by 35% by 2016 from the baseline set in 2003 (NPS Green Parks Plan 2012).

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Energy Consumption	BTUs per gross square footage of buildings		Energy usage (BTUs per gross square footage of buildings) at the park in 2012 was 35.2% lower than the average for the previous 4 years (Source: NPS Annual Energy Report). The park uses electricity motion-sensor lighting, inspecting buildings to keep electricity bills down.



Water Consumption

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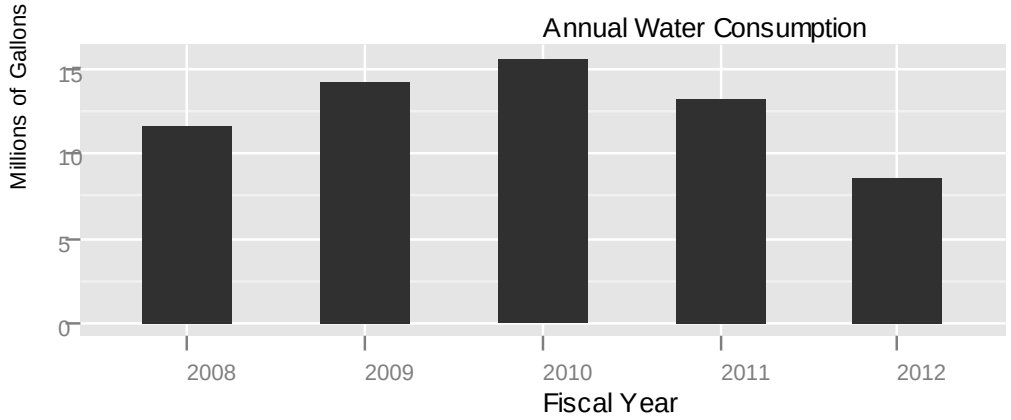
The national and global supply of fresh water has diminished in recent decades, and this trend is likely to continue due to drought and other climatic changes. To contribute to the responsible use of freshwater supplies, encourage groundwater recharge, and protect water quality, the National Park Service is improving its efforts to conserve water, reuse gray water, and capture rainwater, and has set a goal to reduce non-irrigation potable water use intensity by 30% by 2020 from the baseline set in 2007 (NPS Green Parks Plan 2012).

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Consumption	Millions of gallons		Water consumption at the park in 2012 was 37.9% lower than the 4-year average for 2008–2011 (Source: NPS Annual Energy Report).



Chapter 3. Summary of Key Stewardship Activities and Accomplishments

Activities and Accomplishments

Catoctin Mountain Park has responsibility for managing natural and cultural resources of national significance to the American people. The items below provide examples of stewardship activities and accomplishments by park staff and partners of Catoctin Mountain Park to maintain or improve the condition of park resources and values for this and future generations:

Natural Resources

- Deer management strategy has been designed to maintain the integrity of the forest, including working with the public to develop the Environmental Impact Statement, and monitoring the regeneration of forest plants
- Reduction of deer numbers to allow recovery of forest

- Continuing efforts to reduce invasive plant and animal species, such as the removal of barberry and other alien plant species.
- Exotic Plant Management Team (EPMT) work conducted annually to control invasive plants
- Monitoring of forest vegetation by the National Capital Region I&M Network and park staff
- Actively monitoring fish populations in partnership with MDNR
- Access to streams is restricted during trout spawning season to protect fish
- Efforts have been taken to reduce sedimentation into streams that harm fish, such as installing silt fences
- Monitoring of water quality is done monthly by I&M and park staff
- Joint fisheries agreement with the State of Maryland
- Completing Natural Resource Condition Assessment to synthesize existing natural resource data for the park
- Riparian buffer planting to reduce erosion
- Working with partners to improve stream condition by establishing native plants outside of the park
- Working with maintenance crews to conduct compliance before taking actions that affect natural and cultural resources
- Geoscientist in the Park to analyze proper placement of trails based on information from the park soils map
- Partnership with USDA Forest Service to monitor gypsy moths and control outbreaks
- Fire management plan. The park is trying to get an active prescribed burning program in place
- The Park's Foundation Document has been recently updated to identify priority resources based on the park's purpose and significance

Cultural Resources

- A four-year archeological survey was recently completed
- Ongoing condition assessments for archeological resources and other cultural resources
- National register nomination for the entire park
- A new baseline has been established for cultural resource inventories in park, to provide information for the Cultural Landscape Inventory and List of Classified Structures
- Roof replacement on historical buildings
- Historic stone wall repaired at visitor center
- Efforts to inventory and remove graffiti from historic buildings
- Protecting cabins by staining them to protect from exposure to elements

Visitor Experience

- The park has significantly increased the number of education and outreach programs, including new school programs
- Camp Misty Mount and the Adirondack Shelters are now part of the National Campground Reservation System for easier reservations by visitors
- Efforts are being made to connect the northern portion of the Catoctin Trail to the Appalachian Trail
- All wayside interpretive displays have been improved
- Seamless cooperation with adjacent Cunningham Falls State Park
- Presentations to schools about deer reduction efforts
- CATO received the regional Support to Interpretation award from the National Capital Region
- Law enforcement active patrolling of trails to locate hazard trees and other items that might affect visitor safety
- Foot patrols by law enforcement through camps for visitor and resource protection
- A section of trail was developed parallel to a road to improve visitor safety (visitors previously had to hike on the road)
- Boy Scouts and other volunteer groups have contributed considerable time to help the park maintain trails; scouts completed access ramps at Greentop cabins
- Artist in Residence planned for both spring and summer, with plans for gallery shows in Frederick
- More than 600 volunteers have contributed more than 12,000 volunteer-hours of time to help the park maintain resources
- Park is working to develop volunteer leaders who will in turn organize volunteer groups
- Second Nature, Bridging the Watershed, and First Bloom programs
- School groups organized and brought to the park by Latino-American group
- Volunteers from GeoCorps developed a geology website for the park, and conducted erosion studies in streams
- Re-establishment of partnership with Job Corps; Job Corps workers improved a park trail to improve wheelchair accessibility.

Park Infrastructure

- Installing new lighting fixtures with energy reduction features such as motion sensors, and orienting them downward to reduce light pollution
- Hazard trees removed along roads and in camp areas to improve visitor safety
- Primary electric transmission lines through the park were replaced
- Park is instituting a more organized trail maintenance system, similar to "adopt a trail"

- CATO has joined the Climate Friendly Parks program, which is a network of parks nationwide that are putting climate friendly behavior at the forefront of sustainability planning. A student intern was hired in 2012 through the Student Conservation Association to conduct an emissions inventory and develop an action plan for the park.
- Youth Conservation Corps (YCC) program since 1970s
- Fire engine with operators acquired for fire protection of all resources

Chapter 4. Key Issues and Challenges for Consideration in Management Planning

INTRODUCTION

Catoctin Mountain Park celebrated its 75th anniversary in 2011 but last completed a comprehensive General Management Plan in 1976 to define its mission, roles, and priorities. A comprehensive park plan, referred to as a Foundation Document and its associated Resource Stewardship Strategy are crucial to filling this planning deficiency. These plans will define and update our mission, roles, and priorities to serve the visitors and protect the park resources in the 21st century.

In preparation for the 100th anniversary of the National Park Service in 2016, Catoctin was also selected to complete a State of the Park Report. Park staff identified priority objectives and action items to guide management over the next five years, protecting the park's natural and cultural resources and developing new opportunities for visitors. The park also worked with a variety of experts in the fields of natural and cultural resources, interpretation, law enforcement, and facility management to develop a set of baseline assessments that can now serve as a management planning model for other national parks across the country.

Fiscal constraints, changing visitor demographics, and a need to diversify our workforce are all ushering in complex challenges for parks as the NPS enters its second century. The State of the Park Report will help us strategically access and communicate park conditions and our current plan for the future. Our ability to plan ahead necessitates that we have objective baseline data to assess our park operations and articulate plans that address the multifaceted needs of the parks.

RESOURCE PRESERVATION

The park has many significant resources to preserve, manage, protect and interpret. The park also conserves the geo-physical processes and biological communities that together form this unique natural area. Monitoring results has revealed that diverse taxonomic groups such as rodents, birds, lizards, and snakes remain stable. There are concerns for the effects of climate change, though still undetermined, may dramatically alter the mountains. A number of alien, invasive plants and animals already have a foothold and the NPS needs to remain diligent in its efforts to limit their continued expansion. These require that we devote attention to monitoring and protecting the natural resources of the park; including the land, water, and air resources surrounding us. In order to assess all these resources and their competing needs, we must develop comprehensive management plans to protect and interpret them.

NATURAL RESOURCES

Protect Watersheds

- Headwaters/well head protection
- Riparian buffer acquisition and protection
- Brook Trout preservation
- Sedimentation prevention
- Geologic hazard identification

Water Quality. The park's water quality is impacted by both developed (largely permitted and regulated) and agricultural (largely unregulated) activities. Quantity of water flow to and within the park during drought has decreased over the past 30 years and impacted water quality. Significant water quality improvements have been seen where regulations and agreements have addressed quantity and quality issues (e.g., dissolved oxygen and temperature). However, significant improvements remain to be made (e.g., sediment, phosphorus, and nitrate). These improvements will require changes in both upstream agricultural activities and nonpoint source runoff. Stream sediment and nutrients will continue to affect the water quality and habitat of Big Hunting and Owens Creeks, downstream from their junction.

Protect Wildlife

- Habitat and migration corridors protection

Fish and Wildlife. The park has an adequate assessment on numbers and condition of most fish and wildlife species in the corridor. Bioblitzes could help us confirm our data snapshots of what is present. White-nose syndrome is likely on the way for local bat populations and perhaps Chronic Wasting Disease in deer. Between warming temperatures and increasing numbers of invasive species and diseases, more and more native species are losing ground. The park needs to find ways to quantify and address these issues. Some of the changes are likely due to visitor impacts, and determining an appropriate number of visitors and their uses to the habitat without impairing it is a key planning issue for the park.

Protect/Restore Vegetation

- Riparian buffer protection
- Invasive species control
- Restoration of fire into the ecosystem

Although the park is 97% forested, there are still riparian buffers that need to be planted both inside and outside the park. While the park can inventory, treat, and attempt to control these species on park lands, it has little to no control over how park neighbors manage their land. Private lands around the park continue to be seed beds for invasive species that infest the park. Serious infestations have had major effects on the landscape. Combined with the anticipated effects of accelerated climate change, which may include warmer winters, our invasive plant problems could become much worse.

Invasive Species: Several invasive species threaten to change the ecosystem in the coming decades.
Emerald Ash Borer: Catoctin contains millions of ash trees the arrival of this pest seems almost inevitable.
Hemlock Woolly Adelgid: Hemlock vegetation along park streams is rapidly disappearing
Gypsy Moth: is once again cycling through oak populations.
American Chestnut Blight continues to scour this native hardwood.

Another compounding factor has been the removal of fire from the park's ecosystem for nearly 100 years. The forest evolved under a naturally occurring fire regime that limited alien species encroachment throughout the park. These fires encouraged native plant growth. A new prescribed fire strategy is being developed and tested.

Protect Air Quality

- Monitor air quality in park to protect views and vistas
- Protect night sky to ensure normal operation of ecosystem processes (mating, migration, etc.)

Catoctin Mountain Park is continuously looking for ways to partner with other agencies to improve the management of both natural and cultural resources. External developments that may impact park resources include light, heat and water pollution that will affect the soundscape, night skies, and the aquatic environment.

CLIMATE CHANGE

Overshadowing all of our concerns for the natural and cultural resources are the potential consequences of rapid climate change. Continued increases in air temperatures along with predicted changes in precipitation, relative humidity, storm frequency and storm intensity will bring about great changes in the ecological communities we know and understand today. However, with the likely extirpation of some species and the new introductions of others, the full ramifications of those changes (and how to plan for them) remain unpredictable (Harley et al. 2006, Hoegh-Guldberg and Bruno 2010).

Reduction of greenhouse gas emissions at Catoctin will largely focus on reduction of electric consumption as it is 70% of the source of our emissions. Through educational outreach programs, awareness of the impact of invasive species on native flora and fauna may open new opportunities to work more closely with private landowners.

CULTURAL RESOURCES

- *Archeological Sites:* A comprehensive archeological survey has been completed for the park. Currently and historically, most archeological sites are located as the result of development projects, which often leads to documentation and destruction of the sites. Baseline information that describes the integrity of historic and archeological sites is also critical to understanding and managing these unique resources.
- *Cultural Anthropology*: An Ethnographic Overview and Assessment has not been completed for the park, therefore the extent of ethnographic resources is not fully understood. Existing oral histories provide some information on potential ethnographic associations with people who participated in the New Deal-era programs that established the Recreational Demonstration Area that would become Catoctin Mountain Park. There are no identified contemporary tribal associations with park resources. Baseline documentation of ethnographic groups and resources is critical to understanding and managing these unique resources.
- *Historic Structures:* With limited financial resources, long-term sustainability of historic structures will continue to be a challenge. Historic structures require constant attention and present safety and accessibility concerns. Historic structures

often do not meet current ADA requirements, nor do they meet modern fire codes for sprinklers and other safety infrastructure. Upgrading offices, museums and other public spaces to meet modern requirements is a major challenge for the park.

- *Cultural Landscapes:* The completion of the Cultural Landscape Report is a park priority. The park contains two Historical Districts, listed on the National Register of Historic Places, and the entire park is worthy of admission as a Natural Register Historic District.
- *Curatorial Collections:* The Park has a large collection of historical photos and artifacts. Updated and expanded museum exhibits, visual storage of artifacts, and enhanced public access to curated photographs, records, and artifacts will allow greater research opportunities and additional public information through popular articles and scientific and scholarly works. The challenge is to protect these artifacts while providing access and presenting these materials in ways that are discoverable, accessible and relevant to the researcher and public needs. These materials effectively tell the story of Catoctin and the events that preceded and followed the park establishment and transformed the demographics, culture, and environment of this part of Maryland.

VISITOR SERVICES

The National Park Service as an agency is trying to improve connections with underserved demographic groups that visit National Parks infrequently. As visitation declines in the park Catoctin plans to take advantage of its location within metropolitan Washington D.C. and Baltimore regions to increase engagement with minorities and urban populations. At the same time, the park is using the internet and distance learning programs to inform students about the park's resources within their own classrooms. Updating and expanding digital media programs are a key component in offering new visitor opportunities to a public. Social media and web access to the events and undertakings of the park will be instrumental for increasing visitor knowledge of historical events and understanding scientific and scholarly research related to park resources.

Public transportation to the park has decreased over the last several years. In addition, one of the greatest changes schools face is transporting students on field trips. Catoctin plans to enhance both public and student transportation to the park through partnerships. The park is developing additional programming for youth through the YCC, SCA and VIP programs. The goal is to provide work experiences such as internships as well as educational opportunities.

Scenic driving is the number one visitor activity in Catoctin Mountain Park.

- Ensuring visitor and employee safety on Route 77 and roads surrounding the park.
- Closures to address both resource and security needs.

Our law enforcement mission to protect the Presidential Retreat is unique within the National Park System and requires rapid responses on short notice due to changing world events. Our intent is to provide an environment where world leaders can relax and reflect upon important issues in a peaceful and secure setting.

ORGANIZATIONAL EFFECTIVENESS

Park managers are searching for ways to improve staff performance and productivity. Increased travel restrictions leave fewer opportunities for professional enrichment, and collaboration with other NPS staff. The current economic crisis, annual budget uncertainty, and changes in human resources hiring practices and requirements are eroding staff morale. Addressing housing, administrative space, commuting, and quality of life issues, cost of living, housing, etc. in support of staff and volunteer retention is a pressing need.

Park Operations

Catoctin Mountain Park presents a wide variety of operational challenges that are not faced by many parks in the National Park system. The rural nature of the park and the small staff size leads to a reliance upon others from the NPS, other agencies of the federal government, and partners within the community to accomplish the park's mission. The federal government has recently been directed to be more business-minded in regard to our budgets, staffing facility management costs, which include an examination of "life-cycle" costs for all park assets. The funding, staffing and maintenance required to operate facilities must be carefully considered in planning for a sustainable operation. Partnerships with local governments, civic institutions, non-profits and citizens will be a critical component of the long-term strategy to maintain the existing portfolio of park assets.

Motor Vehicle Fleet

One of our greatest sources of carbon emissions is from vehicle use and transportation. Park staff would like to reduce the use of fossil fuels in the management of the park. However, costs of electric vehicles and hybrids (NEV's) are equal to or greater than the cost of using gasoline vehicles. The park will continue its commitment to the use of these vehicles, and seek funding to further enhance its electric fleet.

Park Infrastructure and Facilities Sustainability
Current office space is inadequate for staff needs in some places and oversized in others. At times, crowded offices inhibit productive office work. In addition, current office space (and some visitor infrastructure as well) is not compliant with the American with Disabilities Act. If staffing continues to decline, there will be additional opportunities to reduce our development footprint below 3% of our total land area by consolidating office functions.

While we recently completed a major rehabilitation of our electrical system, the same need exists in our water and sewer system. The park has worked to improve sustainable practices in recent years. In the fall of 2012, the park Environmental Management Team developed a new EMS Program that will help meet the goals of the NPS Green Parks Plan and improve our ability to share information with staff and the public. One of the greatest sustainability challenges the park faces is increased energy costs. Catoctin has the ability to greatly reduce its consumption of fossil fuels and GHG emissions by replacing existing appliance, HVAC, and lighting systems and in some cases by closing or demolishing obsolete facilities.

PARTNERSHIPS AND COMMUNITY INVOLVEMENT

Catoctin Mountain Park has a long history of positive, productive partnerships that assisted with the original creation and development of the park over the last 75 years. The 2006 NPS Management Policies provide us with guidance for developing creative partnerships that ensure the public enjoyment of the park while simultaneously protecting our parks resources from commercialization and heavy-handed economic development that may not be compatible with our mission, or policies favoring specific individual or group over the interests of the general public. While we recognize the beneficial contributions from our existing partnerships, we must also reassess the role, value and appropriateness of our partnerships within the context of our agency's primary mission and the enabling legislation of the park.

Catoctin exists within a 20,000 acre public lands complex that includes two state and two municipal watersheds. A key challenge is working with adjacent land owners with multiple perspectives around the park boundaries. Many members of the park staff have made great strides at continuing and increasing their involvement in community programs such as volunteer fire departments, school and youth programs, and special events.

There has been considerable success with the Volunteer in Parks program and we need to grow additional leadership in our partnership and volunteer communities in order to further expand this program.

Enhancing every visitor's experience at the park can also be accomplished through partnerships and community involvement. Opportunities to engage the park's stakeholders who rely on the tourism industry through orientation and education are being explored as a way to strengthen gateway community relationships and public access to park resources.

CONCLUSION

Catoctin Mountain Park remains an important conservation area at the front range of the Blue Ridge Mountains in Maryland. The park preserves a rich mosaic of cultural and natural resources. In collaboration with its many partners, the NPS continues to strive to understand, monitor and preserve these important resources for their continued enjoyment by present and future generations.

The NPS Centennial in 2016 is a time for us to reassess how well we have met the mandates of our mission to protect, preserve and provide for the enjoyment of these nationally significant resources along the Appalachian Front Range. In the past, the NPS did not have a fully objective set of metrics that could be applied consistently to all parks across the country to evaluate their conditions. The State of the Park process provides us with clear and convenient metrics for the first time. This report will allow us to assess our previous efforts and evaluate their effectiveness in accomplishing our mission. In areas where we are doing well, we can maintain course; but, in realms where we have not met our mandate, we will plan accordingly to use available resources to address the greatest needs. Challenging times require us to be creative in developing new strategies, partnerships, and ways of doing park business to ensure the well-being of these significant resources for future generations to come.

References

See the State of the Park Report for the Park website for a more complete list of references to documents and data sets upon which the assessments in this State of the Park report are based. References for several of the key documents cited in this report are as follows:

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See Also:

Collection of Natural Resource-Related References

Collection of Cultural Resource-Related References

Collection of Visitor Experience-Related References

Glossary

See the State of the Parks home page for a link to a complete glossary of terms used in State of the Park reports. Definitions of key terms used in this report are as follows:

Americans with Disabilities Act (ADA)	Law enacted by the federal government that includes provisions to remove barriers that limit a disabled person's ability to engage in normal daily activity in the physical, public environment.
Archeological Sites Management Information System (ASMIS)	The National Park Service's standardized database for the basic registration and management of park prehistoric and historical archeological resources. ASMIS site records contain data on condition, threats and disturbances, site location, date of site discovery and documentation, description, proposed treatments, and management actions for known park archeological sites. It serves as a tool to support improved archeological resources preservation, protection, planning, and decision-making by parks, centers, regional offices, and the national program offices.
Baseline Documentation	Baseline documentation records the physical condition of a structure, object, or landscape at a specific point in time. A baseline provides a starting point against which future changes can be measured.
Carbon Footprint	Carbon footprint is generally defined as the total set of greenhouse gas emissions caused by an organization, event, product or person.
Climate Friendly Park	The NPS Climate Friendly Park designation requires meeting three milestones: completing an application; completing a comprehensive greenhouse gas (GHG) inventory; and completing a Climate Action Plan, which is the actions, policies, programs, and measures a park will put into place to reduce its GHG emissions.
Cultural Landscape Inventory (CLI)	A Cultural Landscapes Inventory describes historically significant landscapes within a park. The inventory identifies and documents each landscape's location, size, physical development, condition, characteristics, and features, as well as other information useful to park management.
Curation	National parks are the stewards of numerous types of objects, field notes, publications, maps, artifacts, photographs, and more. The assemblage of these materials comprises a museum collection. Curation is the process of managing, preserving, and safeguarding a collection according to professional museum and archival practices.
Exotic Plant Management Team (EPMT)	One of the ways the NPS is combating invasive plants is through the Exotic Plant Management Program. The program supports 16 Exotic Plant Management Teams working in over 225 park units. EPMTs are led by individuals with specialized knowledge and experience in invasive plant management and control. Each field-based team operates over a wide geographic area and serves multiple parks.
Facility Condition Index (FCI)	FCI is the cost of repairing an asset (e.g., a building, road, bridge, or trail) divided by the cost of replacing it. The lower the FCI number, the better the condition of the resource.
Foundation Document	A park Foundation Document summarizes a park's purpose, significance, resources and values, primary interpretive themes, and special mandates. The document identifies a park's unique characteristics and what is most important about a park. The Foundation Document is fundamental to guiding park management and is an important component of a park's General Management Plan.

Fundamental and Other Important Resources and Values	Fundamental resources and values are the particular systems, processes, experiences, scenery, sounds, and other features that are key to achieving the park's purposes and maintaining its significance. Other important resources and values are those attributes that are determined to be particularly important to park management and planning, although they are not central to the park's purpose and significance. These priority resources are identified in the Park Foundation Document and/or General Management Plan. The short-cut name that will be used for this will be Priority Resources.
Historic Integrity	Historic Integrity is the assemblage of physical values of a site, building, structure or object and is a key element in assessing historical value and significance. The assessment of integrity is required to determine the eligibility of a property for listing in the National Register.
Indicator of Condition	A selected subset of components or elements of a Priority Resource that are particularly "information rich" and that represent or "indicate" the overall condition of the Priority Resource. There may be one or several Indicators of Condition for a particular Priority Resource.
Interpretation	Interpretation is the explanation of the major features and significance of a park to visitors. Interpretation can include field trips, presentations, exhibits, and publications, as well as informal conversations with park visitors. A key feature of successful interpretation is allowing a person to form his or her own personal connection with the meaning and significance inherent in a resource.
Invasive Species	Invasive species are non-indigenous (or non-native) plants or animals that can spread widely and cause harm to an area, habitat or bioregion. Invasive species can dominate a region or habitat, out-compete native or beneficial species, and threaten biological diversity.
List of Classified Structures (LCS)	LCS is an inventory system that records and tracks the condition of the approximately 27,000 historic structures listed in the National Register of Historic Places that are the responsibility of NPS.
Museum Collection	NPS is the steward of the largest network of museums in the United States. NPS museum collections document American, tribal, and ethnic histories; park cultural and natural resources; park histories; and other aspects of human experience. Collections are managed by professionally-trained NPS staff, who ensure long-term maintenance of collections in specialized facilities.
National Capital Region I&M Network (NCRN)	One of 32 I&M networks established as part of the NPS Inventory and Monitoring Program. The National Capital Region I&M Network provides scientific data and expertise for monitoring natural resources for parks located in the Washington, D.C. area.
Native American Graves Protection and Repatriation Act (NAGPRA)	A federal law passed in 1990. NAGPRA provides a process for museums and federal agencies to return certain Native American cultural items (e.g., human remains, funerary objects, sacred objects, objects of cultural patrimony) to lineal descendants and culturally-affiliated Indian tribes and Native Hawaiian organizations.
Natural Resource Condition Assessment (NRCA)	A synthesis of existing scientific data and knowledge, from multiple sources, that helps answer the question: what are current conditions of important park natural resources? NRCAs provide a mix of new insights and useful scientific data about current park resource conditions and factors influencing those conditions. NRCAs have practical value to park managers and help them conduct formal planning and develop strategies on how to best protect or restore park resources.

Priority Resource or Value	This term refers to the Fundamental and Other Important Resources and Values of a park. These can include natural, cultural, and historic resources as well as opportunities for learning, discovery and enjoyment. Priority Resources or Values include features that have been identified in park Foundation Documents, as well as other park assets or values that have been developed or recognized over the course of park operations. Priority Resources or Values warrant primary consideration during park planning and management because they are critical to a park's purpose and significance.
Project Management Information System (PMIS)	A servicewide intranet application within the National Park Service to manage information about requests for project funding. It enables parks and NPS offices to submit project proposals to be reviewed, approved and prioritized at park units, regional directorates, and the Washington Office.
Resource Management	The term "resources" in NPS encompasses the many natural, cultural, historical, or sociological features and assets associated with parks. Resource management includes the knowledge, understanding, and long-term stewardship and preservation of these resources.
Specific Measure of Condition	One or more specific measurements used to quantify or qualitatively evaluate the condition of an Indicator at a particular place and time. There may be one or more Specific Measures of Condition for each Indicator of Condition.
Visitor and Resource Protection (VRP)	VRP includes, among other responsibilities, protecting and preserving park natural and cultural resources, enforcing laws that protect people and the parks, fire management, search and rescue, managing large-scale incidents, and on-the-ground customer service.