National Park Service
U.S. Department of the Interior

State of the Park Report

Black Canyon of the Gunnison National Park

Colorado

2014

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On the cover: View down the Gunnison River canyon at Black Canyon of the Gunnison National Park.

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.

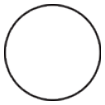
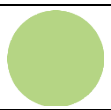
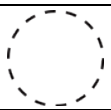
The purpose of Black Canyon of the Gunnison National Park (BLCA) as established by Congress is to preserve an area encompassing spectacular gorges, the Gunnison River, and breathtaking landscapes by protecting its natural, cultural, and wilderness integrity for public benefit, inspiration, and enjoyment.

Significance statements express why the park unit's resources and values are important enough to warrant national park unit designation. Black Canyon of the Gunnison National Park is significant because:

- The steeply descending Gunnison River, a major tributary of the Colorado River, shapes the complex natural and human histories of the park and surrounding region.
- The vertical, rugged nature of Black Canyon's inner canyon wilderness presents challenges requiring specialized skill and self-reliance, while providing exceptional opportunities for primitive, unconfined experiences.
- The narrow vertical nature and sheer walls of Black Canyon, in contrast to the surrounding uplands, provide for unexpected and intimate views of one of the world's premier wild canyons.
- Black Canyon of the Gunnison National Park protects canyon and upland environments that encompass old growth pinyon and sensitive species including hanging garden Sullivantia, Black Canyon gilia, Gunnison Sage-grouse, and peregrine falcons.
- Black Canyon, carved by the power of the Gunnison River and born from multiple episodes of uplift and erosion, is one of the steepest, deepest, and narrowest canyons in North America, and reveals 2000 feet of Precambrian basement rock.

The summary table, below, and the supporting information that follows, provides an overall assessment of the condition of priority resources and values at BLCA based on scientific and scholarly studies and expert opinion. The internet version of this report, available at http://www.nps.gov/stateoftheparks/blca/, 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 trend arrow is omitted because trend is unknown (e.g., data from a one-time inventory or only one year of monitoring data) or because an insufficient time series of data are available for calculating a trend.

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 levels during 2005–2009 sulfur wet deposition are in good condition based on NPS Air Resource Division benchmarks. Estimated ozone, nitrogen wet deposition, and average visibility levels in the park during 2005–2009 warrant moderate concern.
Geological Resources and Soils		Many areas throughout BLCA have been disturbed by previous mining and ranching activities causing impacts to soils, vegetation, and associated ecosystem processes. A comprehensive Geologic Resource Inventory Map and Report was completed in 2005. A Soils Resource Inventory Map and Report is scheduled to be completed in the near future. No dedicated hazards mapping or monitoring is currently in place or scheduled. The park is working to address these inventory needs and develop and implement restoration projects where opportunities exist.
Geological Resources Paleontology		Detailed surveys that are limited in scope indicate that paleontological resources in the park are significant and the potential for future significant discoveries is very high. Discovery and documentation of known paleontological localities has increased by over 400 percent in the last decade. Currently park staff has documented 40 paleontological localities which include burrows from worms and mussels; maple and willow leaf impressions; dinosaur tracks; possible fragmentary dinosaur skeletal material; and remains of early flowering trees. Inventory efforts will continue with additional rich discoveries expected.
Gunnison River		The Gunnison River is the only perennial water body in BLCA. Since the arrival of European Settlers, the river has been impacted by fundamental changes to flow regime, water quality, and the introduction of non-native sport fish. Prior to upstream water diversion and storage, bottomland in the Black Canyon was sparsely vegetated. Upstream diversions and dam operations have changed annual and seasonal flow regimes, diminishing the frequency of a flow mobilizing 75 percent of the bottomland from one in three years to one in ten years and leading to a more densely vegetated condition. Water quality has remained excellent and the regulated Gunnison River supports a cold-water ecosystem that favors non-native fish species over a native fishery.

Priority Resource or Value	Condition Status/Trend	Rationale
Red Rock Canyon		The quality of water discharging to Red Rock Canyon water warrants concern. The discharge is principally the result of irrigation return flows from Bostwick Park. The water is a vector for invasive plant species, loads selenium to the lower Gunnison River, and contains high levels of *E. coli* (a bacteria) which is a health risk to park visitors. This drainage sees average flow between 2–6 cfs, which is much higher than would occur naturally. The drainage was listed on the State of Colorado list of impaired waters for selenium and has a published Total Maximum Daily Load.
Plant Communities		Upland plant communities at BLCA are generally in good condition. While infestations of invasive species increased by 26 percent along roads and trails from 2003–2004 surveys to 2010–2012 surveys, they decreased by 40 percent in Red Rock Canyon and 24 percent along the Gunnison River, resulting in a 13 percent decline across all areas combined for the same time period. The increase in xeric conditions in the riparian plant communities warrants some management concern. Continued monitoring of all plant communities will help reveal the future trends and drive management priorities in these ecosystems.
Wildlife Communities		Most vertebrate animal species appear to have relatively stable populations and distributions. Bird species richness is similar to reference conditions with the exception of the presence of three non-native species. Mammal species richness is similar to the historic reference condition, except for the absence of two species largely extirpated from the western US: grizzly bears and wolves. All mammal species present are native. Reptile and amphibian species present in the park are native and species richness is likely the same as historic reference condition.
Special Status Species		While some species' numbers are increasing, concerns remain regarding vulnerability of other species. Peregrine Falcon populations are stable or increasing. The Crawford population of Gunnison Sage-grouse has experienced a severe decline. All species expected to be present in BLCA are present. All bat species may experience drastic population declines or extirpation if the introduced disease, white nose syndrome, expands to the western US. While no current population estimates exist, river otter and their sign continue to be sighted in BLCA since their reintroduction in the 1970s. Bighorn sheep have declined since a reintroduction effort in the 1980s. *Pasteurella spp.* is a concern and could be a reason for this decline. The population of elk which sometimes inhabits the North Rim is greater than Colorado Parks and Wildlife's (CPW) population objective for this species.
Dark Night Sky		The measure of anthropogenic sky luminance for the BLCA area currently falls within the "Good Condition" criteria. The potential for increased population growth coupled with the fact that there are few ordinances in place in surrounding communities to limit sky glow, make this an indicator to watch in the future.
Acoustic Environment		The primary noise source affecting BLCA is jet aircraft. Aircraft can be heard quite frequently from many locations.
Landscapes and Ecosystems Processes		Habitat loss is the single greatest threat to almost every species of concern in the BLCA region. Increasing human development on multiple spatial scales impacts ecosystem integrity and affects the long-term persistence and health of many species. A large portion of the park and surrounding land within five miles of the park are unconverted from their natural state. In addition, human population growth in the area surrounding the park has actually declined slightly over the past decade. In contrast, housing development has increased for the same period, suggesting increased urban sprawl.

Priority Resource or Value	Condition Status/Trend	Rationale
Cultural Resources		web ▸
Archeological Resources		Less than seven percent of the park has an adequate survey for archeological resources. Fifty-seven percent of the sites listed in the NPS Archeological Sites database are assessed as being in good condition.
Cultural Anthropology		No ethnographic studies have been conducted within the park.
Cultural Landscapes		A literature search has been conducted, but no cultural landscapes have a completed inventory and evaluation. A funding proposal is in place to expand inventory efforts. One of two landscapes has a National Register nomination.
Historic Structures		The park has 45 historic structures, 10 of which are buildings. Other historic structures include stone culverts and retaining walls. Currently, seven of the historic structures (mostly associated with the North Rim Scenic Drive) are evaluated as being in good condition. Seventeen properties associated with the List of Classified Structures have been adequately evaluated. All 17 of the historic structures on the park' s List of Classified Structures are listed on the National Register of Historic Places.
History		A Historic Resource Study is needed.
Museum Collections		The park's Scope of Collection statement is current and accurate. The collection is in good condition based on the 2012 inventory survey. Improvements to the museum storage facility are in process to increase protection from fire and other potential threats.
Visitor Experience		web ▸
Visitor Numbers		The number of visitors to the park in 2012 (192,570) was 10.8 percent higher than the five-year average of 173,777 visitors.
Visitor Satisfaction		In 2012, 95 percent of visitors were satisfied with their visit to the park based on the standard NPS survey, which is comparable to the 5-year average of 96 percent and 10-year average of 96.3 percent.
Interpretive, Education Programs, and Community Outreach		Currently all programs and public outreach are very popular with demand exceeding capability, particularly within curriculum-based education programming. There is concern that further staff reduction will negatively impact opportunity for visitors and local constituents to learn about the park and become park stewards.
Interpretive Media – Print Media, Exhibits, Signs, and Website		Great strides have been made in facilitating personal connections to the park. Park staff constantly review media for relevance and adherence to park themes and to ensure visitor safety/orientation needs are met. Social media is being used to expand messages to a broad audience.
Recreational Opportunities		The park provides for a variety of year-round recreational opportunities. While visitors were satisfied with the availability of camping and access into the wilderness, concerns have been raised regarding the lack of intermediate hiking trails, potential capacity issues on routes into the wilderness, and urban encroachment upon the viewshed.

Priority Resource or Value	Condition Status/Trend	Rationale
Accessibility		Campgrounds and one of three picnic areas have been retrofitted to improve accessibility, and the Visitor Center is accessible. Park staff has worked with Harpers Ferry Center to produce large format and Braille versions of the Unigrid brochure. More information is needed regarding best practices for media development to address accessibility standards.
Safety		BLCA is a safe place to visit. Arrests and accidents are infrequent.
Volunteers and Partnerships		The park has dynamic volunteer and partnership involvement that increases operational capacity for resource stewardship, visitor enjoyment and safety.
Park Infrastructure		web ▸
Overall Facility Condition Index		The overall Facility Condition Index (FCI) for 140 locations at BLCA for 2012 was 0.099, which is considered Good 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 27 percent lower than the average for the previous four years.
Water Consumption		Water consumption at the park in 2012 was 15.6 percent lower than the four-year average for 2008–2011.
Wilderness Character		web ▸
Overall Wilderness Character		The Black Canyon of the Gunnison Wilderness is largely undeveloped, and opportunities for solitude or primitive and unconfined recreation abound. The natural quality is very good, although there are some concerns resulting from the presence of non-native plants and the number and condition of special status species. The untrammeled quality of the Black Canyon of the Gunnison Wilderness is exceptional. Natural processes predominate, and there are few actions that control or manipulate the earth processes within the wilderness.

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

The list below provides examples of stewardship activities and accomplishments by park staff and partners to maintain or improve the condition of priority park resources and values for this and future generations:

Natural Resources

- Cooperate with local entities to control invasive weeds.
- Developed fire management plan that provides for the use of fire to meet resource management objectives.
- Construct livestock fence along the boundary of a grazing allotment to prevent livestock from entering the park.
- Participate with Gunnison Climate Working Group to conduct vulnerability assessments and adaptation strategies for the Gunnison Basin.
- Negotiated Federal Reserved water right to protect key park resources.
- Monitor water quality in conjunction with the Northern Colorado Plateau I&M Network.
- Secure 303d listing and Total Maximum Daily Load for Red Rock Canyon.
- Monitor riparian natural resources in conjunction with the Northern Colorado Plateau I&M network.

- Map invasive non-native vegetation in conjunction with the Northern Colorado Plateau I&M network.
- Monitor sagebrush, pinion-juniper, Gambel oak, and aspen vegetation communities in conjunction with Northern Colorado Plateau I&M Network.
- Monitor landbird populations in conjunction with the Northern Colorado Plateau I&M network; Completed park-level implementation of landbird monitoring in two habitats.
- Increased paleontological collections through survey and monitoring.
- Collaborate with Museum of Western Colorado for paleontological collection.
- Conduct comprehensive bat inventory using acoustic monitoring.
- Participate in interagency and private citizen conservation planning with the Crawford Gunnison Sage-grouse working group.
- Cooperate with BLM, Forest Service, NRCS, CPW, and Uncompahgre Plateau project to complete the North Rim Landscape Strategy—a comprehensive, unified strategy to manage landscapes across boundaries.
- Installed bear-proof food storage lockers and completed bear management and response strategy.
- Monitor Peregrine Falcon territories and associated climbing closures in occupied territories.
- Completed Mexican Spotted Owl surveys.

Cultural Resources

- Listed North Rim Drive and CCC camp on the National Register of Historic Places.
- Developed scope of collections.
- Conduct oral history interviews.
- Initiated major archival effort.
- Maintain up-to-date national databases (ASMIS, LCS).
- Compliance inventory.

Visitor Experience

Education:

- Advanced Jr. Ranger Summer Day Camp—in-depth resource-based education programming for local children.
- Redesigned Jr. Ranger Activity Books with new graphics and resource-based activities.
- Reformatted Curriculum-Based Programming to improve online accessibility for educators.
- Gunnison Sage grouse awareness and education promoted through integration in curriculum-based programs and an interagency Sage grouse festival reaching 800 people per year.
- Developing a distance learning program focusing on water conservation and stewardship.

Interpretive Media:

- Created 30 interpretive videos and captioned them—these are housed on the park's website.
- Upgraded in-house exhibitory at North Rim.
- Currently working on Wayside Exhibit Plan.
- Upgraded and standardized all bulletin boards.
- Created a backcountry orientation video.
- Established presence on Facebook/Twitter/YouTube—thousands of followers.
- Major revision of Black Canyon Orientation Film.
- Currently producing Braille and large format version of the park's unigrid brochure.

Interpretive Operations:

- Established night sky programs in partnership with NPS Night Sky Programming office and local astronomy societies in both Gunnison and Montrose.
- Established Primary Interpretive Themes in consultation with Resource Stewardship and Science Division.
- Themes were also vetted through Foundations workshop.
- Long Range Interpretive Plan identifies nexus between interpretation and resource stewardship, highlighting ways to communicate issues and successes.
- Established annual meeting between Interpretation staff and Resources staff.

Information Technology:

- New satellite service at BLCA North Rim, South Rim and Cimarron.
- Extensive revision and conversion of websites to Content Management System and near daily updates.
- Webcams installed at both parks; popular with park users and local entities.

Visitor and Resource Protection:

- Expanded patrol capability using lightweight, packable rafts has greatly expanded the terrain rangers can cover.

- Winter grooming on the South Rim drive has greatly improved the opportunities for Nordic ski & snowshoe enthusiasts. Visitor feedback had been positive and enthusiastic.

Park Infrastructure

- Added FMSS specialist for Hub 3B (CURE, BLCA, GRSA, FLFO) and Field Project Manager (CURE, BLCA, GRSA, FLFO, CAVO, BEOL, SAND, BAND, MEVE).
- Implemented comprehensive recycling program to reduce solid waste disposal by approximately 20 percent.
- Implemented Spill Prevention Comprehensive Countermeasure Plan.
- Implemented an Integrated Solid Waste Management plan.

Buildings and Utilities:

- Upgraded sewer facility including replacement of septic tanks and gravity sewer line.
- Corrected serious safety deficiencies on administrative building, including installation of state-of-the-art gutter ice melt system and dry wells.
- Improved housing, including replacement of sliding glass doors with low e models.
- Retrofitted water transportation truck to State of Colorado specifications.
- Performed U.S. Public Health Service and met or exceeded all standards for drinking water systems.
- Performed upgrades to nine water systems to meet State of Colorado drinking water regulations.
- Rehabilitated photovoltaic system providing power to the North Rim visitor contact station and employee housing.
- Rehabilitated North Rim visitor center, offices, and housing, including wood preservation treatment.
- Performed wood preservation treatment and stabilization on CCC buildings.
- Performed wood preservation treatment on log structures, including visitor center, kiosk, restrooms.
- Upgraded water well pump house at East Portal to meet State of Colorado drinking water regulations.

Roads, Trails, and Fleet:

- In maintenance shop, upgraded and corrected safety deficiencies of parking lot.
- Administrative building parking lot expanded and restriped.
- Relocated cattle guards on main entrance road.
- Installation of new entrance gate on North Rim road, for winter closures.
- Major rehabilitation of the North Rim gravel road.
- Rehabilitated all overlook safety railing (wood).
- Performed pavement preservation and restriping on all asphalt park roads.
- Replaced major highway signs along Highway 50.
- Installed bear-proof garbage and recycling containers.
- Continued improvement and stabilization of parkwide trail system.
- Upgraded fleet with alternative fuel vehicles (flex fuel and electric).

Key Issues and Challenges for Consideration in Management Planning

Significant park-wide planning efforts in the last two years have resulted in a strategic view of BLCA's issues and challenges. These plans include: Housing Needs Assessment, Backcountry and Wilderness Management Plan, Foundation Document, and Long Range Interpretive Plan. In addition, the Servicewide Call to Action has suggested a number of opportunities to prepare for a second century of stewardship and citizen engagement, consistent with positioning the park for the centennial of the National Park Service in 2016.

Improving the condition of the park's natural and cultural resources

Climate change is an issue for all aspects of park management and operations, including natural and cultural resources, facilities, and visitor experience. Climate change response may also drive new partnerships. BLCA must manage the natural and cultural resources to increase resilience in the face of climate change. This includes conducting research to fill data and knowledge gaps, seeking funding to accomplish research needs as identified in the Resource Stewardship Strategy, and engaging citizen stewards in education activities at all levels. Specific issues associated with climate change include:

- The need to improve Gunnison Sage-grouse habitat resilience to the effects of climate change for the Crawford population;
- Potential for increased exposure and erosional impact to paleontological and archeological resources;
- Potential effects to rivers and streams resulting in impacts to water quality, river flow regimes, channel morphology, geomorphic processes, riparian vegetation, and aquatic species diversity and abundance;
- Potential effects to upland vegetation structure and increased potential for non-native species invasion;
- Management efforts to reduce the impacts of climate change may affect wilderness character;

- Potential climate change effects to the resilience of natural systems to other stressors (non-natives, pests, etc.);
- Potential for increased wildland fire activity;
- Management efforts to address potential climate change impacts to cultural resources.

The NPS must demonstrate excellence in science and scholarship to maintain and protect natural and cultural resources, including:

- Continue parkwide inventory of cultural resources and the completion of baseline documents;
- Document historic sites including the North Rim Civilian Conservation Corps spike camp and the discovery of the East Portal CCC camp location;
- Document and assist in the interpretation of the East Portal Townsite;
- Conduct ancillary studies for Ethnographic resources and Cultural Landscapes;
- Complete parkwide Paleontological inventory;
- Conduct bat surveys to detect potential sensitive species;
- Complete reptile and amphibian surveys.

The NPS must collaborate with other land management agencies and partners to create, restore and maintain landscape-scale resource integrity. Specific issues include:

- Continue the annual delivery of the Black Canyon water right;
- Protect adjacent lands in private ownership through cooperative conservation efforts with willing land owners;
- Cooperatively manage Gunnison Sage-grouse and their habitat across the North Rim landscape;
- Complete and implement the Wilderness and Backcountry Management Plan.

The NPS must demonstrate excellence in science and scholarship to maintain and protect designated wilderness and wilderness character. Specifically:

- Complete and implement the Wilderness and Backcountry Management Plan;
- Update the Wilderness Character Assessment every five years.

Improving the connection of people to parks

The NPS must connect people to parks by developing and nurturing a life-long relationship between the public and parks—especially for young people—through a continuum of experiences which include recreation, education, volunteerism, and employment. Issues specifically associated with connecting people to parks include:

- Expanding the use of the park as a place for healthy outdoor recreation that includes people's physical, mental and social well-being;
- Welcoming and engaging diverse communities through culturally relevant park education experiences;
- Expanding the park's education mission through distance learning, in-park interpretive and educational programs, and citizen-steward opportunities;
- Educating park users to the potential effects of climate change and the role they can play in mitigating impacts.

Improving the built environment for visitor and employee satisfaction

The NPS must improve and maintain a sustainable infrastructure to serve visitors and staff. Issues associated with improving infrastructure include:

- Reduce the park's carbon footprint and showcase the value of renewable energy;
- Improve and maintain facility conditions both for the public and the staff;
- Engage partner organizations to provide legacy support for the ongoing improvement of visitor centers, research labs and museum collection storage facilities;
- Improve visitor and employee safety through targeted training for staff and education for visitors. Seek funding to repair and replace aging infrastructure that poses hazards;
- Increase facility and programmatic accessibility.

Chapter 1. Introduction

The purpose of this State of the Park report for Black Canyon of the Gunnison National Park (BLCA) 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.

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- The narrow vertical nature and sheer walls of Black Canyon, in contrast to the surrounding uplands, provide for unexpected and intimate views of one of the world's premier wild canyons.
- Black Canyon of the Gunnison National Park protects canyon and upland environments that encompass old growth pinyon and sensitive species including hanging garden Sullivantia, Black Canyon gilia, Gunnison Sage-grouse, and peregrine falcons.
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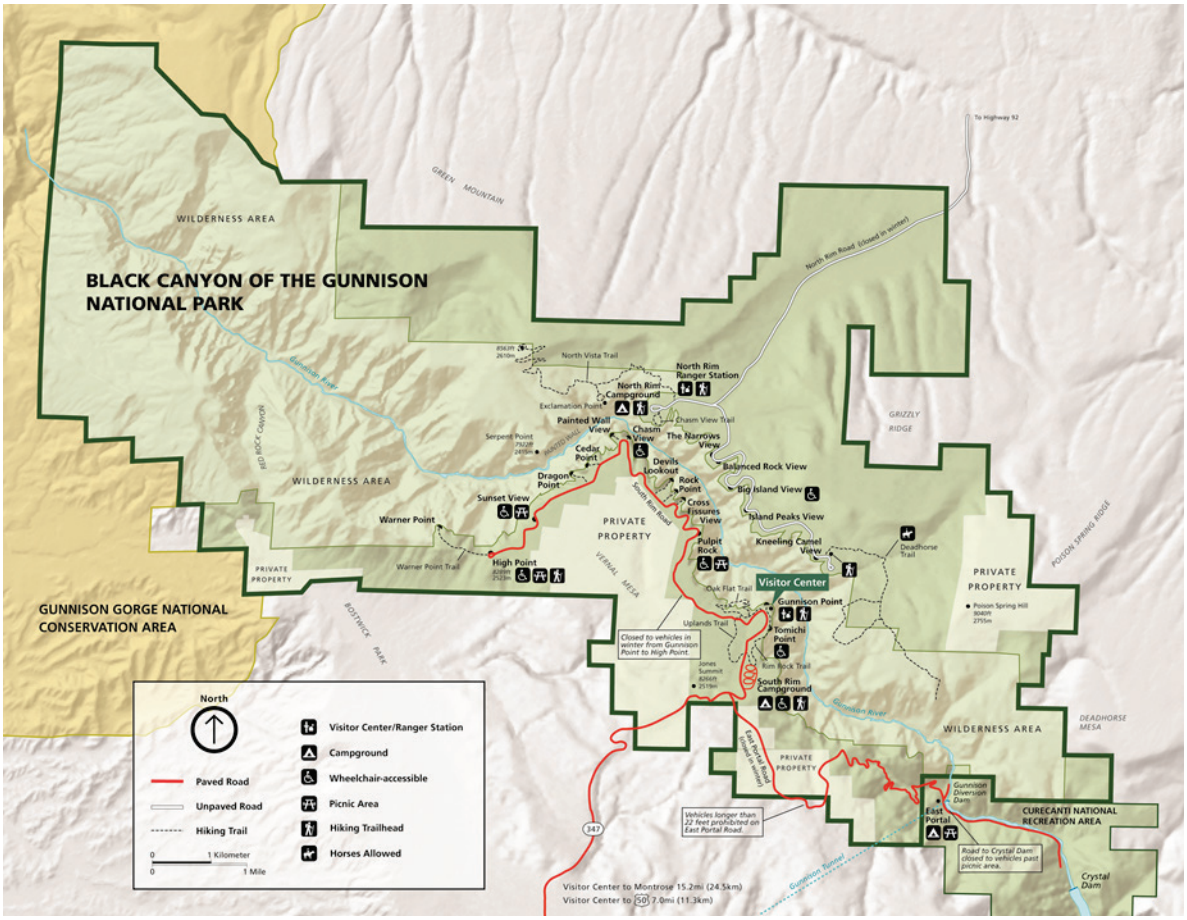


Map of the Park

Location of the Park in Colorado

Chapter 2. State of the Park

The State of the Park is summarized below for five categories—Natural Resources, Cultural Resources, Visitor Experience, Park Infrastructure, and Wilderness Character—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

web ▸

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Ozone	Annual 4th-highest 8-hour concentration (parts per billion (ppb))		The estimated ozone level during 2005–2009 at BLCA was 68.0 parts per billion, which warrants moderate concern based on NPS Air Resource Division benchmarks. No trend information is available because there are not sufficient on-site or nearby ozone monitor data (NPS ARD 2013). List of ozone-sensitive plant species.
Deposition	Sulfur wet deposition (kilograms per hectare per year (kg/ha/yr))		During 2005–2009, estimated wet sulfur deposition was 0.5 kg/ha/yr which is Good based on NPS Air Resource Division benchmarks. Surface waters and soils in BLCA are generally well-buffered and not likely to be acidified by atmospheric deposition. However, there may be areas in the park where rock is resistant to weathering, and soils and water (e.g., in potholes) may be sensitive to inputs of acidic deposition. No trend information is available because there are not sufficient on-site or nearby wet deposition monitor data (NPS ARD 2013).
	Nitrogen wet deposition (kg/ha/yr)		During 2005–2009, estimated wet nitrogen deposition was 1.0 kg/ha/yr, which warrants moderate concern based on NPS Air Resource Division benchmarks. The park may be

			moderately sensitive to nitrogen-enrichment effects relative to all Inventory & Monitoring parks (Sullivan et al. 2011c; Sullivan et al. 2011d). Certain vegetation communities in the park, including grassland and wetland plant communities, may be vulnerable to excess nitrogen deposition, which can alter plant communities and reduce biodiversity. However, levels of wet nitrogen deposition at BLCA are relatively low.
Visibility	Haze Index (deciviews (dv))		During 2005–2009, estimated average visibility in BLCA was 3.3 dv above natural conditions which warrants moderate concern based on NPS Air Resource Division benchmarks. During 2000–2009, the trend in visibility on the 20 percent clearest days improved and remained relatively unchanged on the 20 percent haziest days (no statistically significant trend) (NPS ARD 2013). The Clean Air Act visibility goal requires visibility improvement on the 20 percent haziest days, with no degradation on the 20 percent clearest days.

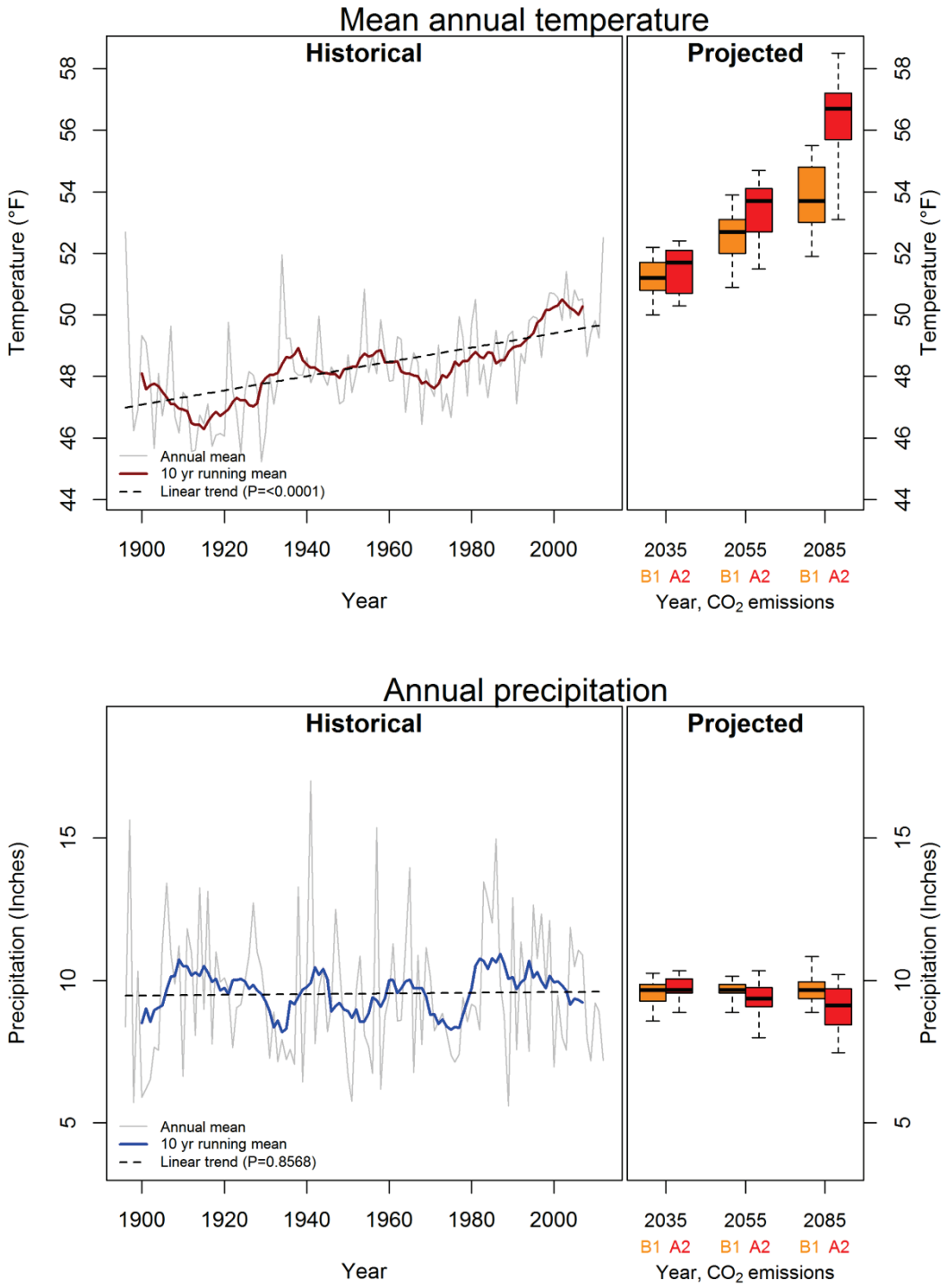
Resource Brief: Historical and Projected Changes in Climate at Black Canyon of the Gunnison National Park

Climate change, in conjunction with other stressors, is impacting all aspects of park management from natural and cultural resources to park operations and visitor experience. Effective planning and management must be grounded in our comprehension of past dynamics as well as the realization that future conditions may shift beyond the range of variability observed in historical data. Climate change will manifest itself not only as shifts in mean conditions (e.g., increasing mean annual temperature) but also as changes in climate variability (e.g., more intense storms and droughts). Put another way, land managers are dealing with both rapid directional change and tremendous uncertainty. Understanding climate change projections and associated levels of uncertainty will facilitate planning actions that are robust regardless of the precise magnitude of change experienced in the coming decades.

Historical climate trends (1896–2012)
Historical climate trends for BLCA (Fisichelli 2013) are based on historical climate data from a nearby long-term weather station (Montrose, CO; cdiac.ornl.gov). Over the 117 year instrumental record (1896–2012) mean annual temperature showed a significant warming trend, +0.23 °F per decade (see Figure below). Annual precipitation showed strong interannual variability and no significant long-term increasing or decreasing trend.

Future climate projections
Future climate projections for the area including BLCA are from multi-model averaged data (Kunkel et al. 2012). Mean annual temperature, compared with the 1971–1999 average, is projected to increase 4–5 °F by mid-century and 5–8 °F by the end of the century, depending on the greenhouse gas emissions scenario (see Figure below). This is roughly twice the rate of warming experienced during the 20th century. Current greenhouse gas emissions are on a trajectory similar to the higher emissions scenarios (see references in Fisichelli 2013). Warming by mid-century is projected for all seasons, with the greatest increase likely in summer (Kunkel et al. 2012). There is wide agreement among individual climate models in the direction and magnitude of warming over the coming decades. Precipitation models indicate minor changes in annual totals over the coming century, though increases in winter and decreases in summer total precipitation are projected (Kunkel et al. 2012)). Precipitation variability is likely to remain large over the coming decades, and there is greater uncertainty in precipitation than temperature projections.

In addition to warmer mean temperatures and changes in total precipitation, climate change will manifest itself in many other ways. This includes more frequent heat waves, droughts, floods, and an extended frost-free season. The number of days with maximum temperatures > 95 °F is projected to increase by 5–10 days per year while the annual number of days with minimum temperatures below freezing is projected to decrease by 30+ days (high (A2) emissions scenario 2041–2070 compared with 1980–2000; Kunkel et al. 2012). Small changes in total annual precipitation may mask large shifts in the precipitation regime and associated impacts to ecosystems. The annual maximum number of consecutive days with rainfall less than 0.1 inches may increase by 5–10 days while the annual number of days with heavy rainfall (> 1 inch) is projected to increase by 20–40 percent (high (A2) emissions scenario, 2041–2070 compared with 1980–2000; Kunkel et al. 2012). Significantly warmer temperatures and a more variable precipitation regime, including heavier rain events and an increased number of days between rain events, may lead to both more frequent droughts and more severe flooding and erosion.



Historical and projected mean annual temperature and annual precipitation for BLCA. Historical data (1896–2012) are from the Montrose, CO long-term weather station (cdiac.ornl.gov).Projected climate change (30 year means) for the region including the park (data from Kunkel et al. 2012, see Tables 4, 6 and Figures 14, 25) are for three future time periods centered on 2035 (2021–2050), 2055 (2041–2070), and 2085 (2070–2099). Two greenhouse gas emissions scenarios are presented, the low (B1) and high (A2) scenarios (IPCC 2007). Projected climate boxplots indicate the variability in future projections among 14–15 CMIP3 climate models. Values for the area including the park are based on projected changes from individual climate models averaged across the southwest region: the bold horizontal black line represents the mean among all models, the upper and lower bounds of the boxes indicate the 75th and 25th percentile model output values and the whiskers show the minimum and maximum change averaged across the region.

Geological Resources and Soils

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Through a unique series of geologic events, the Gunnison River has carved one of the world's premier wild canyons. No other canyon in North America combines the narrow opening, sheer walls, and startling depths offered by the Black Canyon of the Gunnison. Geology provides the foundation for the park landscape and ecosystems. The geologic history spans nearly two billion years ago to the present. The major park icon, the Painted Wall, is a spectacular geologic feature.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	Geologic Resource Inventory map and report		A Geologic Resource Inventory Map and Report was completed in 2005 (http://www2.nature.nps.gov/geology/inventory/gre_publications)
	Soils Resource Inventory map and report		The Soils Resource Inventory map and report are scheduled to be completed in 2014.
Geohazards (Rockfall, Slump/Landslide, Debris Flow, Swelling Clay)	Percent of Geohazards Mapped/Monitored		Steep slopes, seasonal storms, little vegetative cover and snow-melt all contribute to slope instability and erosion. Rockfall, slump landslides and debris flows can cover or destroy park infrastructure (roads, trails, buildings) causing potential disruption of access and visitor safety impacts. Mancos, Morrison, Entrada, Dakota, and Burro Canyon Formations are prone to failure when undercut by roads or trails. Some hazard information is contained in the existing Geologic Resource Inventory Map and the proposed Soils Resource Inventory Map would add to this information. No dedicated hazards mapping or monitoring is currently in place.

Resource Brief: "…for the preservation of the spectacular gorges…"

The Black Canyon of the Gunnison is one of the nation's most stunning wild canyons. Steep, deep, and narrow, peering over the sheer walls of the Black Canyon gives even the most seasoned outdoor traveler dramatic pause. The geologic events that occurred to create this chasm are not by themselves unusual. But, the series in which they happened are what makes this canyon unique and look dramatic.

Metamorphism (rock changing processes), intrusions (molten rock squeezing up through other rocks), periodic episodes of rock uplift (rocks being pushed miles upwards), volcanoes, and river carving have all contributed to the formation of the Black Canyon. These events have spanned an enormous amount of geologic time going back 1.8 billion years.

Looking downstream in the Black Canyon

The opportunities for detailed study of the rocks themselves are as impressive as the views into the canyon. The Black Canyon provides geologists with a window into Earth's past to better understand past environments, the formation of our continent, and current dynamic forces affecting our landscape.

Geological Resources - Paleontology

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	Percent of known fossil bearing Geologic Units adequately surveyed		Less than 50 percent of known fossil bearing units within BLCA have been surveyed. Fossils are non-renewable resources and help to provide important information about the Earth's history. Detailed surveys that are limited in scope indicate that paleontological resources in the park are significant. The potential for future significant discoveries is very high. Landscapes erode and with them, fossil specimens become exposed and are subject to theft, deterioration, and reburial. Surveys to locate paleontological sites are integral to preserving the knowledge that fossil specimens can provide.
Documentation	Paleontological Resource Inventory and Monitoring Report		Tweet et al. (2012) provided a detailed review of BLCA paleontological resources. Fossils are most commonly found in the Morrison Formation and Dakota Sandstone at BLCA. New discoveries are common.
	Percent of known sites with adequate NPS and Colorado Office of Archeology and Historic Preservation documentation		Forty of the 42 known paleontological localities (95 percent) have adequate documentation.
Condition	Percentage of Paleontological Localities Documented in Good Condition using the NPS Paleontological Condition Assessment Form		The NPS uses a Paleontological Condition Assessment Form to provide a numerical rating of site condition and to categorize the condition of each locality as poor, fair, or good. The form considers both natural and human threats affecting site stability, as well as management remediation efforts. The 40 localities at BLCA were all rated as being in Fair condition. Evaluations are updated at five-year intervals.

Resource Brief: Paleontological Discoveries at Black Canyon of the Gunnison

The study of fossil plants and animals, often extinct, have fascinated generations of curious minds. Although paleontological discoveries were common on neighboring Bureau of Land Management lands, regular fossil surveys at BLCA did not begin until the last decade. Since 2005, the park's Paleontology Program has conducted two summers of survey activity. The surveyors have revisited or recorded 39 fossil locations in BLCA.

The fossil types recorded hint at the variety of life that has occupied the park area through time and the dramatic changes in landscape. Fossils include burrows from worms and mussels that lived in muds along open seaways; maple and willow leaf impressions; dinosaur tracks; and remains of early flowering trees.

In upcoming years the Paleontology Program plans additional survey and monitoring of the fossil resources. Additional training and experience for park staff will be gained through working with regional museums' staff and the National Park Service Geologic Resources Division. The program also hopes to provide volunteer opportunities to members of the nearby communities to promote an appreciation of the park's resources.

Shell fragment suggests a period of marine inundation for this location

A leaf impression similar to today's maple found in rock from near the end of the age of dinosaurs

Gunnison River

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The Gunnison River carves an impressive gorge, limits the accumulation of sediments, and nourishes the aquatic and riparian life of the inner canyon at BLCA. The Gunnison River receives water from an area of more than 10,284 square-kilometers (3,970 square miles) that includes the Elk, Sawatch, San Juan and West Elk Mountains. Water quantity is determined from U.S. Geological Survey gage records, which are complete from 1909 until the present. BLCA water quality is regularly sampled by Park staff and is assessed in terms of the Colorado Basic Standards and Methodologies for Surface Water. The park has collected an extensive set of water quality data since 1992. Active management of the fishery in the canyon is limited due to tremendous challenges to access. CPW and the NPS cooperatively oversee fish resources.

The Gunnison River is snow melt dominated and is fed by water originating from many small catchments located at high altitudes. These high altitude catchments are characterized by an extended period of below freezing temperatures, with snow being the primary form of precipitation. The extended cold period favors season-long accumulation and storage of water as a snowpack and the dominant portion of the annual precipitation, about 70 percent, falls between October and April. Seventy percent of the runoff occurs during May through July. In spring rising temperatures cause rapid snow melt with the subsequent rapid release of the stored water. Gunnison River hydrology is characterized by an extended winter-season low flow; a large magnitude spring-season peak flow; and a summer-season recession flow. The spring-season peak flow is the primary driver of proper river and canyon dynamics of the Black Canyon.

The Gunnison River above BLCA and below the town of Gunnison is now fully regulated by the Aspinall Unit dams. As much as 1,325 million cubic meters (1,075,000 acre-feet) of water can be in storage. Operations of the dams has, for the period 1977 through 2012, resulted in substantively altered seasonal flow regimes to BLCA. Diversion of water from the Gunnison River for irrigation began in the 1880s and was subsequently intensified by the 1909 opening of Gunnison Tunnel and operations at Taylor Park (post 1937). Today, the actual peak flow amount is derived by terms of decree and formulated as a part of Aspinall dam operations.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Geomorphology	Fraction of the river channel mobilized Fraction of bottomland cleared Fraction of bottomland cleared by scouring		Prior to upstream water diversion and storage, Gunnison River bottomland in BLCA was sparsely vegetated. The bottomland was consequently free of trees because the frequency and magnitude of scouring peak flows was sufficient to clear about 65 percent of the bottomland. Aquatic plants were not very abundant and the few plants that colonized the bottomland are species that are able to grow and mature utilizing the annual pulse of water. Today, the small fraction of bottomland that is mobilized is diminished and the frequency of a flow mobilizing

	Fraction of bottomland by community type		75 percent of the bottomland is reduced to a frequency one in ten years. In total, the bottomland has trended to a more densely vegetated condition and with species, some invasive, that would not have occurred with scouring flows. The condition of the bottomland is principally a function of the scouring force supplied by the annual spring-peak flow. The frequency of these high-valued, scouring spring peak flows has trended downward. Implementation of the BLCA water right is anticipated to stabilize this trend.
Water Quantity	Median annual discharge (acre feet (af)) Median seasonal discharge (af) Magnitude of peak discharge (cubic feet per second (cfs))		Operations at Aspinall Unit dams have resulted in changed seasonal flow regimes to Black Canyon. For the seasonal period January through March, dam operation has increased the value of the median discharge approximately 2.5 times from the pre-Aspinall value. For the seasonal period April through July, dam operations have decreased the median discharge approximately 40 percent of the pre-Aspinall value. For the seasonal period August through December, dam operations have increased the median discharge approximately two times the pre-Aspinall value. There has been a significant downward trend in the median value of the annual discharge at the Gunnison River gage below the Gunnison Tunnel. This trend results from the downward trend in natural discharge coupled with diminished discharge from upstream development and diversion by the Gunnison Tunnel. The annual peak discharge tracks with the downward trend in annual discharge.
Water Quality	Dissolved Oxygen (mg/L) pH Temperature (°C) Metals (µg/L) Indicator bacteria (CFU/100mL) Nitrogen species (mg/L) Total phosphorus (mg/L)		In general, water quality parameters do not exceed Colorado state standards (Colorado Department of Public Health and Environment, 2012) at the sampling site on the Gunnison River within the Black Canyon. These exceptional conditions, however, do not account for fundamental changes of primary river function due to upstream impoundments and withdrawals.
Biodiversity	Occurrence/Abundance /Species Richness of Aquatic Invasive Species Periphyton and Macroinvertebrates Native and Non-native Fish		Since the arrival of European Settlers, the Gunnison River has been impacted by fundamental changes to water quality, geomorphology and flow regime from upstream impoundments and withdrawals, as well as the introduction of non-native sport fish that have outcompeted native species. The abundance of non-native fish species dominates the native fishery, and a healthy macroinvertebrate community supports a high quality non-native sport fishery.

Resource Brief: Maintaining Gunnison River Flows through the Black Canyon

Black Canyon of the Gunnison National Park is located downstream of three dams on the Gunnison River operated by the Bureau of Reclamation termed the Aspinall Unit. The Unit's traditional operation had emphasized maximizing hydropower generation. In 2001, the United States filed an application (the claim) in Colorado Water Court to quantify a reserved water right for the Gunnison River through BLCA. The water right is termed a Federal Reserved right and dates from March 2, 1933, the date the Park came into being. The Colorado Water Court upheld the legal basis of the water right in March, 1978.

Park management determined that restoring and maintaining historic channel conditions and those flow-related processes that formed the canyon are most critical to preserving the natural integrity of the park and to fulfilling the specific purposes for which it was established. The claim identified flow requirements which mimic the natural hydrology of the Gunnison River and protect the riverine resources within the park. Over the next six years, the claim application was jeopardized by a settlement agreement and consequent federal lawsuit. In 2007 the United States entered into mediation with all parties interested in the claim, including the State of

Colorado, a coalition of conservation groups, and water user and other interested groups. In December 2008, following more than four decades of scientific study, legal wrangling and mediation, the parties reached an agreement, in the form of a decree proposed to the Colorado Water Court. The decree was approved on December 31, 2008.

The decree quantifies a water right in the park for Gunnison River flows including a springtime peak flow, shoulder flows before and/or after the peak flows, and a minimum flow for the remainder of the year. These flows are critical to the physical and biological processes that maintain the spectacular Black Canyon through the park and are tied to the specific May 1 forecast of inflow to the Unit. The release of the identified flows in any given year may affect other federal bureau mandates, water users within the basin, hydropower generation, reservoir storage, and recreation, so the claim extends discretion to the Secretary of the Interior to confer with the State of Colorado and all interested parties when exercising the water right. The decree acknowledges that the Secretary will balance these needs with his/her management discretion assigned by federal water-related law.

The Gunnison River through the Black Canyon

The decree recognizes the importance of public and private river management issues including rights of existing upstream water users, downstream protection from flooding, and habitat improvement for endangered Colorado River fish also affected by the location of Aspinall Unit reservoirs.

Red Rock Canyon

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Quantity	Annual Discharge (af)		The discharge in Red Rock Canyon is artificial and is principally the result of irrigation return flows from Bostwick Park. The volume of surface and groundwater in is much higher than would occur naturally; before irrigation Red Rock Canyon was likely dry. This flow creates habitat and is a vector for the colonization of invasive plant species and transports selenium and *E. coli* into the park.
Water Quality	Dissolved Oxygen (mg/L) pH Temperature (°C) Metals (µg/L) Indicator bacteria (CFU/100mL) Nitrogen species (mg/L) Total phosphorus (mg/L)		The aquatic system of Red Rock Canyon is an artificial environment. Although the overall condition of water quality is a concern, chronic exceedances of specific parameters have triggered a 303d listing and Total Maximum Daily Load assessment for selenium. Chronic exceedances of *E. coli*, although not 303d listed, are a concern for contact and ingestion of water. (Colorado Department of Public Health and Environment, 2012.)
Biodiversity	Occurrence/Abundance/ Species Richness of Aquatic Invasive Species Periphyton and Macroinvertebrates Native and Non-native Fish		The aquatic environment in Red Rock Canyon is artificial and created from water supplied by irrigation return flows. These flows and degraded water quality create an environment that is poor habitat for aquatic invertebrates and fish, but an excellent vector for invasive plants. The expected condition is dry/ephemeral drainage with no persistent aquatic ecosystem.

Plant Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Species Richness	Species detected per monitoring plot		Fertig et al. (2012) and Hogan et al. (2009) report a total of 543 plant taxa representing 90 families for BLCA. Thirteen and 36 species are local and regional endemics, respectively. Seventy-four (13.6 percent) are non-native species, nineteen of which are considered noxious by Colorado. This is slightly lower than the state average of 15.6 percent non-native species (Rejmanek and Randall 1994). No species are listed as endangered but 18 are considered species of concern by the Colorado Natural Heritage Program.
Invasive Plants	Infestations of Invasive Plants		Using very similar methods the number of invasive plant infestations has decreased by 13 percent between surveys done in 2003–2004 and 2010–2012 (Dewey and Anderson 2005, Edvarchuk et al. 2012, Perkins 2013). Riparian areas and the areas along the North Rim and most South Rim roads have generally decreased in the number of infestations, while infestations have increased along the East Portal Road and trails during this time period.
Gambel Oak	Percent cover of invasive plants Percent shrub and perennial grass cover Species per plot		Percent cover of exotic plants in Gambel oak shrublands from 2008 to 2011 was 8.5 percent (Witwicki 2010, 2012a, 2012b), with little unprotected soil (less than ¼ of surface cover) in sagebrush shrublands at BLCA. Canopy cover was 50.2 percent for shrubs and 33.6 percent for perennial grasses during the same time period. Average number of species per plot during 2008–2011 was 15.5.
Pinyon Juniper	Soil stability Invasive plants occurrence and percent cover Species per plot Live tree percent cover Seedling density Percent dead trees		Soil stability averaged 3.8 in plots collected from 2008 to 2011 (Witwicki 2010, 2012a, 2012b). There were 49 priority invasive plants found along 89.2 ha on the Warner Point and North Vista trails (Edvarchuk et al. 2012, Perkins 2012). Percent cover of exotic plants in pinyon-juniper woodlands from 2009 to 2011 was 5.9 percent, mean number of species per monitoring plot was 9.5, and live tree cover averaged 24.9 percent (Witwicki 2010, 2012a, 2012b). There was an average of 539 two-needle pinyon (*Pinus edulis*) and 292 Utah juniper (*Juniperus osteosperma*) seedlings per ha in data collected from 2009 to 2011 indicating sufficient recruitment. An average of 9.3 percent of overstory pinyon-juniper trees were dead from 2009 to 2011 (Witwicki 2010, 2012a, 2012b).
Sagebrush	Infestations and Percent Cover of Invasive Plants Large Canopy Gaps Species per plot Percent Shrub and Perennial Grass Cover Soil Stability		Soil stability averaged 2.8 in plots collected from 2008 to 2011 (Witwicki 2010, 2012a, 2012b). Only 0.3 infestations of invasive plants per ha were found in sagebrush at BLCA (Edvarchuk et al. 2012, Perkins 2012). Percent cover of exotic plants in sagebrush stands from 2008 to 2011 was only 1.1 percent, mean number of plant species per plot was 17.3, (Witwicki 2010, 2012a, 2012b; pooled data from BLCA and Curecanti National Recreation Area (CURE)), and 4.5 percent of canopy gaps detected were larger than 200 cm. There was 33.1 percent shrub and 23.4 percent perennial grass cover in sagebrush shrublands from 2008 to 2011 (Witwicki 2010, 2012a, 2012b; pooled data from BLCA and CURE).

Riparian Vegetation	Infestations and percent cover of invasive plants on the Gunnison River and in Red Rock Canyon		Riparian plots averaged four priority invasive plants per ha and 7.6 percent cover in 2010. Reed-canary grass was the most widespread invasive with 7.6 percent cover (Perkins 2013). The estimate of xeric conditions is about six times higher than would have existed under natural conditions at Warner Point (NRCA in prep.). There were 3.3 priority invasive plants per ha in 2010 and an estimated cover of 2.3 percent in Red Rock Canyon. Reed-canary grass was the most common invasive species with an estimated cover of 1.7 percent (Perkins 2013). The number of infestations has declined along the Gunnison River and Red Rock Canyon by 24 and 40 percent, respectively from surveys done in 2003 and 2004 to the most recent surveys in 2010-2012 (Perkins 2013).

Wildlife Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Amphibians and Reptiles	Species richness		Two amphibian and nine reptile species are confirmed present in BLCA (Hammerson 2005, Childers 2012). Two additional reptile species are listed as probably present by NPSpecies. Current species richness is likely similar to historic species richness.
Birds	Overall species richness Species richness in sagebrush and pinyon-juniper habitats		Giroir (2004) recommended that BLCA be nominated for recognition as a National Audubon Society Important Bird Area (IBA) due to the high number of priority species present. NPSpecies lists a total of 173 species as present or probably present at BLCA, 114 of which are native resident species.
Mammals	Species richness		NPSpecies and Haymond et al. (2003) currently lists 26 meso- and large mammals and 19 small mammals as present or probably present at BLCA.

Special Status Species

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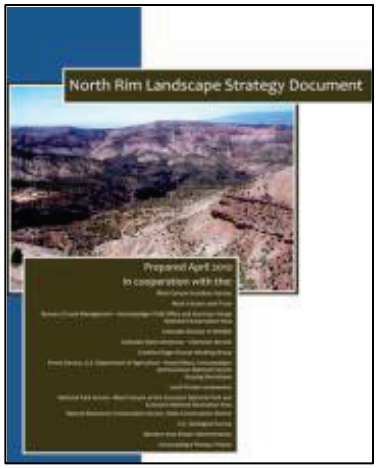
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Peregrine Falcon	No. of occupied eyries Fledging rates		NPS conducts annual Peregrine Falcon surveys at each of the three known territories in BLCA and results show the peregrines in the park continually occupied known nest sites. While individual nests have failed on occasion, each year the number of fledged peregrines is greater than the number of nesting adults (Reese 2012). Protections for Peregrine Falcon nests seem to be very effective. The survival, dispersal and recruitment of fledged peregrines are unknown. Peregrine Falcon populations are stable or increasing in the BLCA region.

Gunnison Sage-Grouse	Population estimate indices Gunnison Sage-grouse habitat monitoring		Gunnison Sage-grouse (GUSG) have a very restricted range; seven geographically separated populations remain in Colorado and Utah. Their current range is estimated to be less than 10 percent of the species' historic range. Only two NPS units are occupied by GUSG, BLCA and CURE. The Crawford population is a small (2012 population estimate = 98 breeding individuals in 14,170 ha) and geographically isolated (CPW 2012, USFWS 2013). GUSG habitat within BLCA encompasses 12 percent of the Crawford population range. GUSG population monitoring is accomplished through lek counts, which provide an index of abundance that is useful in determining population trends rather than a defensible estimate of population size (GSRSC 2005). The Crawford population has fluctuated over the past 12 years, and has sharply declined in the last five years (CPW 2012). Preliminary evaluation of sagebrush habitat within BLCA shows that this area has significantly more mountain shrub canopy cover than targeted in the habitat guidelines outlined in the Gunnison Sage-grouse Rangewide Conservation Plan (GSRCP 2005). On January 10, 2013, the USFWS proposed listing the species as endangered (USFWS 2013).
Bats	Species occurrence		Haymond et al. (2003) documented presence of 14 bat species in BLCA and lists two additional species as probably present. Recently, BLCA staff has confirmed the presence of the two species not detected by Haymond et al. and also detected one new species to BLCA using remote acoustic survey methods (Frey 2012). Western mastiff bats were detected for the first time in BLCA. This species was previously not known to occur in Colorado (Adams 1992). Capture is necessary to positively confirm this state record. In total, 17 species have been detected in BLCA. Townsend's big-eared bat, a year-round resident, is a species of concern for the state of Colorado. Little brown bat and Brazilian free-tailed bat populations are also reported to be in decline (Adams 1992). White-nose syndrome, an introduced fungal disease, has decimated bat populations in the eastern US, and it is anticipated that the disease may expand to the western US.
River Otter	Frequency of sightings		Reintroductions of otter occurred just upstream of the Gunnison diversion tunnel from 1977 to 1981 and at the Gunnison Gorge NCA in 1976 and 1977 (CPW 2003). A confirmed sighting of a mother otter with young was made in 1988 at Gunnison Gorge. Periodic observations of otters and otter sign has continued since the releases, though no firm population estimates are available. In recent years the range of the Gunnison population has apparently increased to include areas of BLCA. Sightings of otters are rare, but footprints, prey remains, scat, and evidence that otters have traveled on snow are frequently observed.
Bighorn Sheep	Abundance		CPW has not completed a herd management plan for bighorn sheep in the management unit which encompasses BLCA. *Pasteurella spp.* infection is a concern for bighorn sheep in this area, since domestic sheep grazing allotments fall within this herd's range. *Pasteurella* is a pneumonia-causing bacteria which can be spread from both domestic and wild sheep. Certain strains can cause mortality and decreased body condition, leading to low lamb recruitment.

Elk	Abundance		The elk population in CPW's Data Analysis Unit 52, which encompasses the north rim of BLCA, exceeds the management objective of 2,200 to 2,400 individuals (CPW 2005). Elk disproportionately use private land and the north rim of the BLCA, where hunting pressure is low or nonexistent, during approximately 3 months of the hunting season (Ouren pers. comm.). Elk use of BLCA is low outside of hunting season and fall season use has not caused any known resource damage.

Resource Brief: Cooperative Conservation of Gunnison Sage-grouse

The U.S. Fish and Wildlife Service recently proposed to list the Gunnison Sage-grouse as endangered. Gunnison Sage-grouse have a very restricted range, with seven small and geographically separated populations remaining in Colorado and Utah. Only two NPS units are occupied by Gunnison Sage-grouse, CURE (Gunnison Basin population) and BLCA (Crawford population). Gunnison Sage-grouse require a variety of quality nesting, brood-rearing and wintering microhabitats throughout a large, contiguous landscape. The Crawford population ranges across lands managed by Bureau of Land Management (BLM), NPS, and private landowners. Effective conservation of this population can only be accomplished by working cooperatively at the landscape scale. The NPS has been collaborating with local state and federal land management agencies, local landowners, ranchers and environmentalists to conserve



Displaying male Gunnison Sage-grouse on the Range Cone lek, Crawford population. Photo by Doug Homan

the Crawford population and protect and enhance sage-grouse habitat. In 2010, NPS staff helped to complete the North Rim Landscape Strategy Document, which outlines strategies to unify management objectives across the north rim landscape, moving away from agency-by-agency and project-by-project management. The NPS also participates in the Crawford Gunnison Sage-grouse Working Group, which completed a conservation plan in 2011 outlining specific goals and tactics for habitat improvement and restoration, research, and protections for the Crawford population. As a result of these efforts, park staff is completing a landscape-scale, cross-boundary prescribed burn plan with BLM to reduce decadent mountain shrubs, enhance forb growth in brood-rearing habitat, remove invading juniper and reduce conflict and competition for critical wintering habitat between elk and grouse. Staff is also providing support to CPW's population augmentation program, which is increasing Crawford's breeding population and genetic diversity by introducing sage-grouse from the Gunnison Basin population. The park is completing a 5.5 mile wildlife-friendly fence on NPS lands to exclude cattle from a retired grazing allotment and removing and restoring stock ponds disturbed by concentrations of cattle to proper hydrologic function and native vegetation, expanding available quality sage-grouse habitat and reducing habitat fragmentation.

Dark Night Sky

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The nighttime photic environment and its perception of it by humans (the lightscape) are important to many facets of park integrity. They are both a natural and a cultural resource and are critical aspects of scenery, visitor enjoyment, and wilderness character. Many wildlife species and ecological processes depend on natural darkness and a natural nighttime photic regime. Black Canyon has designated Wilderness, important ecological resources, and the park's lightscape is valued by campers, stargazers, and night hikers; thus the park is considered to possess a *more sensitive* photic environment. The reference condition is set at the natural condition, based on an accurate physical model of the night sky. Current conditions or desired future conditions should be expressed as a ratio over the reference condition. Further information is found in interim IRMA document Recommended Indicators of Night Sky Quality.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Anthropogenic Light	Anthropogenic Light Ratio (ALR)— the Average Anthropogenic Sky Glow: Average Natural Sky Luminance		As measured from Sunset View, ALR was 0.27 in 2008 and falls within the Good Condition criteria. Modeled values of 0.4 ALR for the entire park and 0.6 ALR for the Wilderness are interpreted to be slightly pessimistic because of the park's topography. Population growth has been modest in Gunnison and Delta counties, but rapid in Montrose and Mesa counties, resulting in an overall negative trend. Furthermore, few communities have ordinances or programs to limit skyglow.

Acoustic Environment

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The acoustic environment is important with respect to the ecological integrity of the park and plays a key role in visitors' experience of the park setting. Noise can inhibit vital processes related to wildlife health and functioning including: communication, predator/prey interactions, foraging efficiency, mate selection, and efficient habitat use. In surveys, more than 90 percent of visitors identify opportunities to hear natural sounds as an important aspect of their park experience. Periods of low to moderate noise can diminish visitor experience by affecting mood, interfering with communication, and disrupting sleep in campgrounds, and making it more difficult to see and experience wildlife (e.g. birding activities). Noise can also diminish visitors' appreciation of the scenic beauty of an area.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Sound Levels	Difference between daytime noise energy and background sound levels: 12-hour equivalent continuous noise level ($L_{Aeq,12h}$) – estimated background sound level (L_{90})		The difference between the park noise levels and background ambient conditions are approximately 15 dB for sites shielded from river sounds, and likely 0 dB or less where river sounds are noticeable. Data from comparable sites at Great Sand Dunes suggest that background ambient sound levels at BLCA would be less than 20 dB (A) (unpublished NSNS data). The primary noise sources affecting the park are commercial jets. Jets generate approximately 35 dB (A), with jets heard about every 10 minutes during the day.

Landscapes and Ecosystems Processes

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Fire and Fuel Dynamics	Number and size of fires		There were a total of 38 fires in BLCA from 1942–2012 (Wildland Fire Management Information System (WFMI), Bockus 2013). Twelve of the fires were human-caused including two prescribed fires totaling 84 acres on the North Rim of BLCA. The remaining 26 fires were caused by lightning and ranged in size from 0.1 to 3 acres, except the Son-of-a-Gun fire which burned to 50 acres on the west rim of Red Rock Canyon in 1994. The only other fires larger than 3 acres were the 2 prescribed fires in 2009 and 2012, and 2 larger human-caused fires (40 acres in 2001 and 8.6 acres in 2011), (WFMI, Bockus 2013).
Landscape Dynamics	Land Converted (Percent Natural and Converted Land Cover)		More than 88 percent of the park and surrounding land cover within five miles is unconverted. Areas with >60 percent natural land cover favor most forms of landscape connectivity. From 2001 to 2006, <1 percent of area experienced land cover change, and 69 percent of all change was natural disturbance or succession.
	Human population total (# people) and density (# people/km^2)		In 2010, human population size and density within five miles of the park were relatively low (4,264 people, 5.8 people/km^2) and declined slightly from 2000.
	Housing (percent area by housing density class)		In 2010, 92 percent of housing development within 5 miles of the park was characterized as rural (<6.2 units/km^2), but since 2000 exurban housing (6.2–145 units/km^2) has increased by 30 percent. Increases in exurban density, coupled with stable or decreasing population, suggest increasing urban sprawl.

Resource Brief: First Prescribed Fire in Park's History Implemented

First-Ever Prescribed Fire, North Rim Black Canyon of the Gunnison NP

After the completion of the BLCA/CURE Fire Management Plan (FMP) in October 2006, and after months of planning and preparation, NPS and Montrose Interagency Fire Management Unit staff successfully implemented the first ever prescribed fire (Rx) in BLCA. The 64-acre Green Grizzly Rx, located on the north rim of the Black Canyon, was completed in early May 2009. The objectives of the Green Grizzly Rx were to reduce the amount of hazardous fuels in the area, improve habitat for Gunnison Sage-

grouse and to reintroduce fire to its natural role in the grass, sagebrush and mountain shrub ecosystem. Fire managers attempted to achieve a "mosaic" burn pattern in the unit that would mimic a naturally ignited lightning fire. The hand-ignited fire targeted Gambel oak, serviceberry, and pinyon and juniper trees encroaching into sagebrush plant communities. This type of burn pattern benefits Gunnison Sage-grouse and other animal and plant species that call this landscape their home.

Mechanical treatments to remove hazardous fuels also have been part of FMP implementation. Wildland Urban Interface (WUI) projects have cleared heavy fuels around the BLCA Visitor Center, Ranger Station, and administrative/housing buildings, and Gambel oak and serviceberry was removed from along the North Rim service road. The piles created from these mechanical fuel treatments were then burned during the winter in 2011 and 2012.

The BLCA/CURE Fire Management Program benefits not only park resources through the reintroduction of fire to the ecosystem but also park visitors and local residents/landowners by reducing the risk from wildfires. The policy of using fire as a management tool will help perpetuate many of the values for which the park was established.

2.2. Cultural Resources

Archeological Resources

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Percent of sites with known date ranges associated with a research theme		No firm dates have been established for any prehistoric site in the park. No prehistoric site has undergone evaluative testing. 16 of 149 sites have tentative dates.
Inventory	Percent of park adequately surveyed		About five percent to seven percent of the park (1,760 acres) has been adequately surveyed.
Documentation	Percentage of known sites with adequate National Register documentation		According to the national ASMIS database 17 of 164 sites (10.4%) recorded at BLCA are Listed, Determined Eligible or Recommended Eligible for the National Register of Historic Places. All 17 sites are treated as eligible until determined ineligible.
Condition	Percentage of archeological resources in good condition		Currently, 57 percent of sites listed in ASMIS are in good condition.

Cultural Anthropology

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research exists to understand the relationship of the park's ethnographic resources and the historic contexts		No ethnographic studies have been conducted within the park.

	Appropriate studies and consultations document ethnographic resources and uses with regards to the park.		Existing information included the 2002 American Indian Affiliation Study for CURE by Dave Ruppert, which should also apply to BLCA even though the study was done for CURE.
Needs Assessment	Ethnographic resources are appropriately addressed in the park's general management plan, development concept plan(s), comprehensive interpretive plan, and resource stewardship strategy.		The Park needs to complete an Ethnographic Landscape Study and Ethnographic Overview and Assessment to incorporate park resources into the listed plans.

Cultural Landscapes

web ▸

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research exists to understand the relationship of the park cultural landscapes to historic contexts of the park.		For North Rim Road landscapes, the NPS Landscape Architecture 1917–1942 historic theme study provides adequate historic context. Additional information is needed for the South Rim Road (and other potential landscapes at BLCA) to address this for other landscape resources. The park has requested funding to continue the process.
	Adequate research exists to document and preserve the cultural landscape of the park.		No cultural landscapes have completed Cultural Landscape Inventories.
Inventory	The scope of cultural landscapes in the park is understood and a determination has been made whether or not they are a fundamental resource.		Cultural Landscape Inventories need to be completed. In the interim, the North and South Rim Roads should be treated as important resources.
	Percent of landscapes eligible for National Register with accurate, complete, and reliable Cultural Landscape Inventory (CLI) data.		No cultural landscapes have been evaluated.
Documentation	Percent of cultural landscapes with adequate National Register documentation.		33 percent—North Rim Road has completed nomination which adequately addresses cultural landscape. No other National Register documentation.

Resource Brief: East Portal Landscape

Tucked at the bottom of the Black Canyon are the remains of a town that flourished for a short period of time and disappeared almost as if washed away in a spring flood. The road, adapted and used today, was etched into the cliffs of the canyon in 1904, and buildings soon followed as all was needed to support the construction of the Gunnison Tunnel. Built by the newly created Reclamation Service (later the Bureau of Reclamation), the six-mile long tunnel diverts a portion of the Gunnison River to agricultural fields and communities near the park.

Foundations, an original part of the road, and artifacts dot the hillside as part of the historic fabric of the 200 to 250 people who lived there during the 10 years the settlement was active. As part of the on-going effort to record and protect historic landscapes at BLCA and sister park, CURE, the park is looking at ways to research and document the resources that remain from this former community.

Historic Structures

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Percentage of historic structures evaluated using appropriate historical contexts.		All seventeen properties on the List of Classified Structures have been adequately evaluated. Historic Resource Notebook addresses remaining 28 historic structures and was completed in 2007.
Documentation	Percentage of historic structures with adequate National Register documentation.		The park has 45 historic structures, 10 of which are buildings. Other historic structures include stone culverts and retaining walls. 97 percent (44 of 45) of the historic structures have adequate National Register documentation.
	All historic structures have been recorded commensurate with their significance and mandated purposes.		In 2006, the park compiled available documents for historic structures.
Condition	Percentage of historic structures in good condition		Currently, 15.5 percent (7 of 45) of structures are in good condition and 67 percent are in moderate condition. Most of the 'good' rated structures are associated with the North Rim Scenic Drive.

History

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand significance of site.		The park has been compiling primary sources for historical research in recent years so that they are available, but a research assessment has not been conducted.
	Research at the appropriate level precedes planning decisions involving cultural resources.		The park includes the appropriate historical research as part of the compliance process prior to making planning decisions.

Documentation	Percentage of historic properties with adequate Nat'l Register documentation or with Determinations of Eligibility.		About 87 percent of all historic properties in the park have either adequate NRHP documentation or a DOE. 100 percent (17 of 17) of historic structures on the List of Classified Structures have adequate documentation for the National Register of Historic Places. One of three cultural landscapes (North Rim Rd) has a completed National Register nomination.

Museum Collections

web ▸

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	The scope of museum collections in the park is understood.		The park's Scope of Collection statement is current and accurate. All resources have been surveyed to determine their appropriateness for inclusion in the museum/archive collection.
	Percentage of objects accessioned and cataloged		Only 15.4 percent of the known objects have been catalogued. The majority (more than 100,000) of the uncatalogued materials are archival. Efforts are underway to curate and reduce the backlog.
Documentation	Adequate and current baseline documentation		The park has a current Scope of Collection Statement, and a baseline Archives Survey is in progress, but the park needs to address the completion of a Collection Condition Survey, Fire Protection Plan, Housekeeping Plan, Collection Management Plan, Collection Storage Plan, Integrated Pest Management Plan, and a Security Survey.
Condition	Overall condition of the collection based on condition survey and improvements to storage.		The collection is in good condition based on the most recent inventory survey in 2012. Improvements to the museum storage facility are in process to increase protection from fire and other potential threats.

Resource Brief: Museum Collections at Black Canyon and Curecanti

There are thousands of objects in the BLCA museum collections, ranging from archeological objects and natural history specimens to photographs and administrative archives that contain 17,000 records. Among the items are oars from the boats used by one of the first exploring parties to navigate the rapids of the Gunnison River, articles associated with the building of the Gunnison Tunnel (an early day water diversion project), and a rich herbarium for each of the two parks that, combined, holds an excellent gathering of specimens from mid-level elevations within Colorado.

The archives chart the 1930s development of the park when it was first established as a national monument through the efforts to protect it as a national park. Especially enlightening are letters between monument founder Mark Warner and NPS managers on the planning efforts and work by the Civilian Conservation Corps. Along with many photographs from early events through modern day are materials and oral history interviews with many people, including climbers who maintained a register at the top of the Curecanti Needle and have scaled cliff walls when climbing was a newly developing sport in the 1960s and 1970s.

2.3. Visitor Experience

Visitor Numbers and Visitor Satisfaction

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of Visitors	Number of visitors per year		The number of visitors to the park in 2012 (192,570) was 10.8 percent higher than the 5-year average of 173,777 visitors (NPS Visitor Use Statistics).
Visitor Satisfaction	Percent of visitors who were satisfied with their visit		FY 2012 Visitor Satisfaction Survey was at 95 percent, close to the 5- and 10-year average of 96.0 percent and 96.3 percent. In the 2010 Visitor Study 90 percent of visitor groups rated the overall quality of facilities, services, and recreational opportunities as "very good" or "good".

Resource Brief: Community Outreach

The Division of Interpretation, Education, and Technology participates in many weekly and annual community events in Montrose, including the Main in Motion weekly event, the Parade of Lights, USA Pro Cycling race, various career fairs and library programs, and providing training for Western State Colorado University's Outdoor Education/ Interpretation classes. Staff from the Education Branch, as well as from Black Canyon's Interpretation Branch, are involved in as many community events as possible. Involvement in such events often includes members of other park divisions, especially Resource Stewardship and Science. The goal is to have a uniformed presence whenever it is appropriate at community events. In addition, park staff also serves as advisory members to many community groups, including the West Elk Loop Scenic Byway Commission, The Montrose Association for Commerce and Tourism, Montrose Astronomy Society, and Rotary International. An annual Astronomy Festival held in the park draws community attention, particularly in the form of volunteers from the Astronomy Society.

Interpretive, Education Programs, and Community Outreach

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Education Programs	Number and level of teacher satisfaction with programs, and number of participants		The number of programs offered during the last three years has remained stable. The loss of two interns in FY13 will reduce the number of programs offered. At current staffing levels, demand was not met. Programs receive a 90 percent or better excellent rating. Program lacks a designated facility; groups meet at the Visitor Center causing conflict with other user groups.

Ranger Programs	Number and level of visitor satisfaction with programs, and number of participants		The last three years the general trend has been upward in the number and variety of programs offered due to three added interns to the program. This funding ceases beginning FY13. The campground amphitheater infrastructure is in desperate need of repair. The 2012 survey for visitor satisfaction with ranger programs was 100 percent "very good" and "good" and is close to the five-year average of 98.6 percent.
Junior Ranger Programs	Number of programs and attendance		The Junior Ranger Program is well attended and popular. Major revisions to the book are in progress and are expected to increase participation. 1,437 children completed the program in 2012.
Community Outreach	Number of events attended and contacts		The number of events attended has increased from 2 to 20 from FY08 to FY12. The number of visitor contacts has increased from 145 to 10,000 in the same time period. BLCA 2012 Service Wide Interpretive Report

Resource Brief: Education

Black Canyon of the Gunnison National Park has a long-standing and highly effective curriculum-based education program. Continuously offered since 1985, the program currently serves over 4,000 students, teachers, and parents each year. An extensive menu of program offerings is available to grades K–8, with the majority of programming in the form of outreach to classrooms in surrounding communities. In-park field trips, week-long summer day camps, and community events are additional core program components. The lack of a designated facility or classroom space at the park results in regular conflicts with other visitors at the only park visitor center, which captures 75 percent of visitors. Communities served include Montrose, Ridgway, Ouray, Olathe, Delta, Crawford, Hotchkiss, and Paonia. Community demand for park programming is high, and relationships are strongly positive. Current staffing levels cannot meet program demand. Distance learning options are being developed, and lesson plans and supporting material are available to educators via the park website. All lessons are aligned to current state and national education standards, and are guided by best practices in interpretation and education. Lessons are continually evaluated and modified; new lessons are offered on a regular basis, reflecting evolving park management and service-wide priorities. Staffing is supplemented with interns. The internship program engages young adults considering careers with the National Park Service, providing a career path to diverse new talent. As the only federal agency in the Montrose area providing curriculum-based programming, the National Park Service fills a leadership role in the community for family-focused events, such as Main in Motion, and Youth Appreciation Day.

Interpretive Media – Print Media, Exhibits, Signs, and Website

web ▸

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Wayside Exhibits	Condition and currency		All wayside exhibits are beyond their design life with panel and base material degrading. Many contain outdated information and do not meet the NPS graphic design standards or interpretive themes. Cyclic Maintenance funds are expected beginning 2014 to improve this situation. In-park exhibit planning is underway.
Park Directional Signs (off-site)	Usefulness, quantity, and placement		There is a concern about clarity of State highway signs differentiating north and south rims. Directional signs on Fruitland Mesa are small and lack design consistency.
South Rim Visitor Center Exhibits	Condition and Accuracy		Installed in 2000, the exhibits are in satisfactory condition and still convey accurate information. Some components need updating and replacement of outdated and failed technology.
Print Media	Accuracy and availability of primary park publications		The park has consolidated much of the information from multiple sources into the park newspaper. Publications are regularly evaluated and updated. Most printing of publications is done through support of the cooperating association, Western National Parks Association.
Audio-visual Media	Orientation Film		Orientation film was revised in 2011 and is captioned. It does not adequately address major park interpretive themes.
Websites	Currency and scope of website		Information is current, comprehensive, and accurate but is difficult to navigate due to the constraints of the servicewide Content Management System. The two webcams are very popular with a wide variety of users.
Social Media	Social media presence		Social media efforts have been recently initiated with a variety of video, photo, and text communications using 3 social media outlets. Interest is growing as evidenced through number of followers.

Resource Brief: Facilitating Connections

The purpose of Interpretation and Education at a National Park Service site is to facilitate connections between the interests of the visitors and the meanings of the resources. This is done by establishing Primary Interpretive Themes that recognize the interests of visitors and the meanings of the resources at each park through a long range interpretive planning process that identifies HOW to facilitate those connections. At Black Canyon and Curecanti, interpretive/education staff drafted primary interpretive themes, then vetted those themes through the staff of Resource Stewardship and Science in an on-site meeting, then again through the planning team during the parks' Foundations Workshop. All interpretive/education programming and interpretive media fits within these resource-based themes, providing a framework that assures that the most important resource meanings and issues are related to park audiences, both those who visit, and those who do not.

The Primary Interpretive Themes for Black Canyon are:

- **Geology:** Through a unique series of geologic events, the Gunnison River has carved one of the world's premier wild canyons.
- **Wilderness:** Black Canyon of the Gunnison National Park preserves a vertical landscape at once both accessible and remote, providing rare opportunities for all visitors to experience the values of wilderness.
- **Water:** The Gunnison River provides a home for aquatic and riparian species in an atmosphere of development and politics of the American west.
- **Natural History:** Black Canyon of the Gunnison National Park protects fragile resources along a vertical spectrum from canyon floor to dark skies.
- **Cultural History:** The rugged landscape of BLCA has challenged and limited human influence from pre-history to modern day.

Recreational Opportunities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Camping	Availability of campsites		East Portal campground occasionally fills. South Rim campground rarely fills, however, sites that provide electric hookups are often full. During peak climbing season and on holidays the North Rim campground fills.
Hiking	Range of opportunities		Thirty-nine percent of surveyed visitors indicate a need for a hiking experience that lies in between the relatively short and easy trails on the rim and the significantly more difficult undeveloped routes into the canyon. There are no wheel chair accessible trails. BLCA 2012 Annual Visitor Survey
Wilderness (All activities below the rim)	Availability of permits issued and permit compliance		Visitors are typically able to access the wilderness via their desired route. Infrequently, they may have to access the wilderness by a route of second choice due to capacity issues. Compliance with permit conditions is good.
Viewshed	Condition and maintenance of viewshed		The park is working through conservation easements and land acquisitions to protect the viewshed due to urban encroachment. Agency activities are consistent with maintaining natural landscapes.
Winter Recreation	Range and quality of opportunities		In 2011 winter recreation opportunities and access were improved by grooming and maintenance of 6 miles of winter trail. This attracts cross country skiers and snowshoers. Additional opportunities for more rugged and remote winter experiences exist for independent or ranger led trips.

Accessibility

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Mobility	Number of accessible facilities, trails, and overlooks		Campgrounds and one of three picnic areas have been retrofitted to improve accessibility. The Visitor Center is accessible. Most overlooks do not meet Americans With Disability Act (ADA) standards. Accessibility assessment is needed.
ADA accommodations	ADA compliance		Accessibility assessment is needed. Lack specific, concrete guidance for interpretive media products. Park staff is working with Harpers Ferry Center on large format and Braille versions of the park's unigrid brochure.

Safety

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of law enforcement incidents	Recordable incidents		Arrests are infrequent, with only 30 misdemeanor citations issued in FY12.
Number of accidents or injuries	Recordable incidents		Long term average is 5–7 EMS incidents a year, with most requiring only basic care.

Volunteers and Partnerships

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale Comments
Volunteers	Number and hours contributed		Volunteers support the high angle rescue team, visitor center, night sky programing, and campground operations. In 2012, 41 volunteers contributed 3,196 hours. Funding for staff that provides support and leadership of volunteer programs is at risk.
Partnerships	Number of partnerships		Black Canyon maintains numerous partnerships, including Western National Park Association, The Black Canyon Astronomy Society, West Elk Scenic Byway group, local fire and law enforcement, Interagency fire agreements, BOR, Montrose Library District, and Montrose Association of Commerce and Tourism.

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.

The overall FCI for 140 locations at Black Canyon of the Gunnison National Park for 2012 was 0.099, which is considered Good based on industry and NPS standards. The table below summarizes the number of assets at BLCA within each industry-standard asset category and the mean FCI on October 1, 2012, compared to October 1, 2008, to determine trends in condition.

Asset Category	Number of Assets 2008 / 2012	FCI 2008 / 2012	Condition Status/Trend	Rationale
Buildings	35 / 35	0.130 / 0.015		South Rim Visitor Center and comfort stations received (ARRA) log preservation treatment. North Rim Visitor Center and apartments received rehabilitation of 2 office spaces and visitor reception area and desk. Installed state of the art ice melting system on administrative building to correct major safety deficiencies. Housing (5 units): North Rim housing off-grid system received new energy star propane appliances, flooring, painting, bathroom rehabilitation, and energy efficient lighting. Photovoltaic system inverter was rebuilt and the battery was reconditioned. In the South Rim apartments, staff replaced sliding glass doors to improve energy efficiency, installed an energy star washer and dryer, treated the building exterior with wood preservation treatment and installed energy star lighting (ARRA). Installed night sky compliant lighting.
Campgrounds	3 / 3	0.117 / 0.032		Campgrounds on north and south rim have been rehabilitated with new picnic tables (recycled plastic), bear-proof trash and food storage containers, extensive brush removal to prevent fires, replaced campfire rings, pavement preservation to campsites, replaced site numbers with recycled plastic placards, wood preservation treatment to all vault toilets, new curb stops. Refurbished campground amphitheater.

Trails	24 / 24	0.048 / 0.051		Utilized Mesa Youth Services (PLC) to correct campground and trail deficiencies for visitor and staff safety and enjoyment, including trail brushing, drainage structures, and trail surface repair. All trails have received annual cyclic repairs. NPS trail crew repaired drainage structures, rock staircase installation, rehabilitation of nature trails and overlooks (including guard rail and hand rail replacement).
Waste Water Systems	4 / 4	0.144 / 0.004		South Rim installed new engineered/state approved septic systems (tanks). Reconfigured storm water drainage.
Water Systems	6 / 6	0.054 / 0.027		Procured and state certified water hauling truck to bring drinking water into the park. All water within BLCA is transported by NPS staff from Montrose to the park's water storage system. All drinking water systems are current and certified with Colorado state drinking water regulations. Housing improvements conform to State of Colorado drinking water regulations.
Unpaved Roads	8 / 1	0.048 / 0.001		North Rim road is maintained in good condition, to include dust control, regrading, culvert drainage maintenance.
Paved Roads, Parking Areas, Bridges, Tunnels	33 / 41	0.106 / 0.146		Replaced major highway signs along Highway 50. All asphalt roads received pavement preservation treatment and restriping through Federal Highways. Replaced North Rim barricade/gate and signage at entrance road. Cyclic replacement of regulatory and area signage. Installed concrete parking lot and road at maintenance shop to correct storm water drainage deficiencies. Rehabilitated administrative parking area, including drainage. Moved cattle guards on main entrance road.
All Others	14 / 25	0.087 / 0.049		This category includes wayside exhibits, the amphitheater, and a PV system (scheduled for replacement). PMIS projects are in place for future funding.

Wood preservation treatment at the Visitor Center

Youth crews building fence along the North Rim grazing allotment boundary

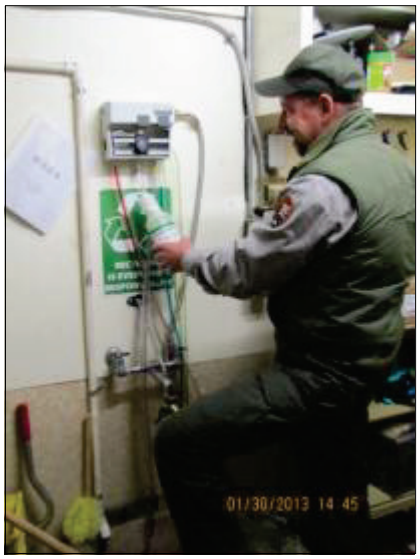
Grading the North Rim road (the Narrows)

Park Infrastructure Brief: Recycling and Greening of the Park Program

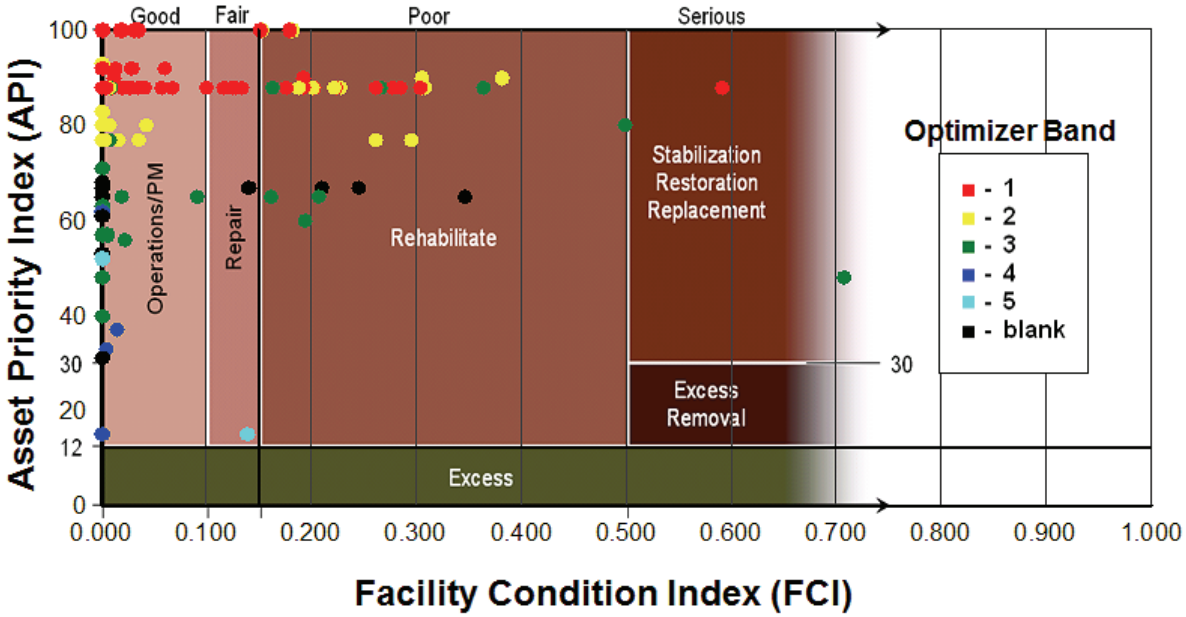
The park has a 5-year contract in place with Waste Management for implementation of a comprehensive recycling program, which includes comingling of #1–#7 plastics and recycled plastic picnic tables, and the installation of recycling stations at marinas, picnic areas, campgrounds, overlooks, housing, and administration building. The program includes green purchasing of paper products, plastic bags, and cleaning accessories and addresses deficiencies identified during an environmental management audit. Park operations use only green cleaning products (EPA approved); non-green chemicals have been removed from the park. In the automotive shop, the park uses re-capped truck tires, recycles used motor oil, and procures re-refined motor oil. All containers installed for the program were bear proof.

Another important facilities management planning tool used at a park is the Asset Priority Index (API). It identifies the importance of the various infrastructure components at a park. The API is determined using five criteria, and is calculated out of 100 possible points. The criteria are weighted based on their importance to NPS core priorities. They are distinct to ensure that each aspect of the asset is measured independently. As a result, most assets will not rate high in every category.

The scatterplot (below) for 2012 shows the FCI for each of the infrastructure asset types at Black Canyon of the Gunnison National Park. It plots buildings, trails, roads, parking areas, and other infrastructure assets against its Asset Priority Index (API). Park managers and maintenance staff use the FCI and API data for each park asset to focus on preventive maintenance and repairs to facilities that are most critical to their parks.



Green chemical mixing station (for diluting and mixing cleaning chemicals)



Optimizer bands—the color of the dots in the scatterplot—are assigned to each facility or asset as a tool to prioritize use of limited funding to maintain park infrastructure. Optimizer Band 1 includes those assets with the highest maintenance priorities. These assets are most important to the park—often linked to the park's enabling legislation or have high visitor use—and usually are in the best condition. Band 1 assets receive the highest percentage of base funding for routine operations, preventive maintenance, and recurring maintenance to keep them in good condition with proactive, planned maintenance. These assets are important to park operations, but because fewer park base dollars are available after maintaining Band 1 assets, Band 2 assets receive a lesser percentage of remaining funds. Assets in the lower priority bands may only receive preventive maintenance for the most critical components or may require special projects or partner funding to maintain them. For additional information about optimizer bands and how park managers use them to make decisions about the efficient use of funding for maintenance and restoration activities at the park, Click Here.

Energy Consumption

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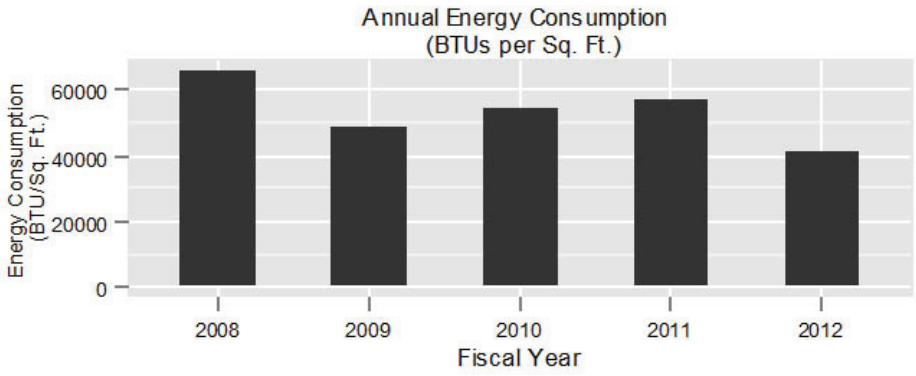
The production of energy to heat, cool, and illuminate buildings and to operate water utility systems is one of the largest contributors to greenhouse gas emissions in the United States. The National Park Service is committed to improving facility energy performance and increasing its reliance on renewable energy sources. The National Park Service has a goal to reduce Servicewide building energy consumption per square foot of building space by 35 percent 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 27 percent lower than the average for the previous 4 years (Source: NPS Annual Energy Report).

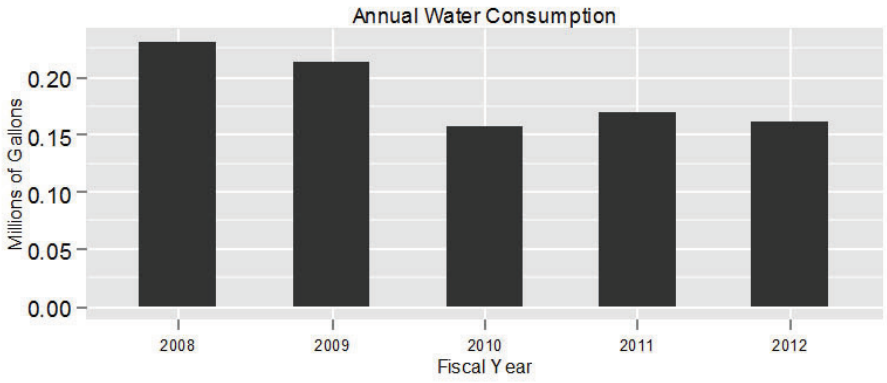


Water Consumption

web

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 percent 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 (162,000 gallons) was 15.6 percent lower than the 4-year average for 2008–2011 (Source: NPS Annual Energy Report) due to increased visitation.



2.5. Wilderness Character

The Wilderness Act of 1964 requires the NPS to maintain Wilderness character, including the qualities of being "…untrammeled by man…undeveloped…natural," and allowing for "…solitude or primitive and unconfined recreation." A detailed evaluation of wilderness character is documented in a 2013 report and is summarized below.

Wilderness Character

web

Indicators of Condition	Condition Status/Trend	Rationale
Natural		The natural quality of Black Canyon of the Gunnison Wilderness is considered outstanding. However, it warrants caution primarily because of the presence of non-native plants and the number and condition of special status species. There are several native plant and animal communities, including species that are proposed or listed as threatened or endangered, sensitive, or of concern. Authorized livestock grazing in the uplands affects natural communities. The water quality is good, but quality and quantity are affected by the operation of upstream dams. BLCA is adjacent to other federally managed land and relatively undeveloped private land, providing a larger protected landscape that connects wildlife habitat.

Undeveloped		The Black Canyon of the Gunnison Wilderness is largely undeveloped. A few structures diminish the undeveloped quality, including fences, stock ponds, abandoned two-track roads, an irrigation ditch, and other structures related to livestock grazing. The uplands have experienced some authorized and unauthorized activities, which detract from the undeveloped character. Park managers are actively removing structures to improve the undeveloped quality. BLCA applies the Minimum Requirement Decision Guide process to administrative actions, which results in occasional use of chainsaws and motorized vehicles for vegetation and wildlife management in the uplands and helicopters in the rugged terrain of the inner canyon. The rugged terrain of the inner canyon has precluded much development.
Untrammeled		The untrammeled quality of the Black Canyon of the Gunnison Wilderness is exceptional. Natural processes predominate, and there are few actions that control or manipulate the earth processes within the wilderness. There are some actions taken by the NPS to improve the natural condition, including controlling nonnative plants. These types of management actions slightly diminish the untrammeled quality.
Solitude or Primitive and Unconfined Recreation Opportunity		Opportunities for solitude or primitive and unconfined recreation abound in the Black Canyon of the Gunnison Wilderness. The inner canyon attracts hikers and anglers who hike into the rugged canyon. The location for routes into the canyon is constrained by steep terrain; they are mostly rocky, some with eroded gullies, have few signs, and are lightly maintained. There is currently a permit system with a fixed number of permits available for entering the inner canyon. Some additional regulations are being proposed. With the exception of the Red Rock Canyon area, most visitors are accommodated. No fires are permitted; however, illegal fire rings, caches of camping gear, and ad-hoc camp furniture are often discovered and dismantled or removed. Two composting toilets serve users of popular hiking routes.
Other Features and Values		Limited opportunities exist to experience various cultural resources that evidence the prehistoric and historic use of wilderness by man. Impacts to these cultural resources are estimated to be minimal.

Chapter 3. Summary of Key Stewardship Activities and Accomplishments

The list below provides examples of stewardship activities and accomplishments by park staff and partners to maintain or improve the condition of priority park resources and values for this and future generations:

Natural Resources

- Cooperate with local entities to control invasive weeds.
- Developed fire management plan that provides for the use of fire to meet resource management objectives.
- Construct livestock fence along the boundary of a grazing allotment to prevent livestock from entering the park.
- Participate with Gunnison Climate Working Group to conduct vulnerability assessments and adaptation strategies for the Gunnison Basin.
- Negotiated Federal Reserved water right to protect key park resources.
- Monitor water quality in conjunction with the Northern Colorado Plateau I&M Network.
- Secure 303d listing and Total Maximum Daily Load for Red Rock Canyon.
- Monitor riparian natural resources in conjunction with the Northern Colorado Plateau I&M network.
- Map invasive non-native vegetation in conjunction with the Northern Colorado Plateau I&M network.
- Monitor sagebrush, pinion-juniper, Gambel oak, and aspen vegetation communities in conjunction with Northern Colorado Plateau I&M Network.
- Monitor landbird populations in conjunction with the Northern Colorado Plateau I&M network; Completed park-level implementation of landbird monitoring in two habitats.
- Increased paleontological collections through survey and monitoring.
- Collaborate with Museum of Western Colorado for paleontological collection.

- Conduct comprehensive bat inventory using acoustic monitoring.
- Participate in interagency and private citizen conservation planning with the Crawford Gunnison Sage-grouse working group.
- Cooperate with BLM, Forest Service, NRCS, CPW, and Uncompahgre Plateau project to complete the North Rim Landscape Strategy—a comprehensive, unified strategy to manage landscapes across boundaries.
- Installed bear-proof food storage lockers and completed bear management and response strategy.
- Monitor Peregrine Falcon territories and associated climbing closures in occupied territories.
- Completed Mexican Spotted Owl surveys.

Cultural Resources

- Listed North Rim Drive and CCC camp on the National Register of Historic Places.
- Developed scope of collections.
- Conduct oral history interviews.
- Initiated major archival effort.
- Maintain up-to-date national databases (ASMIS, LCS).
- Compliance inventory.

Visitor Experience

Education:

- Advanced Jr. Ranger Summer Day Camp—in-depth resource-based education programming for local children.
- Redesigned Jr. Ranger Activity Books with new graphics and resource-based activities.
- Reformatted Curriculum-Based Programming to improve online accessibility for educators.
- Gunnison Sage grouse awareness and education promoted through integration in curriculum-based programs and an interagency Sage grouse festival reaching 800 people per year.
- Developing a distance learning program focusing on water conservation and stewardship.

Interpretive Media:

- Created 30 interpretive videos and captioned them—these are housed on the park's website.
- Upgraded in-house exhibitory at North Rim.
- Currently working on Wayside Exhibit Plan.
- Upgraded and standardized all bulletin boards.
- Created a backcountry orientation video.
- Established presence on Facebook/Twitter/YouTube—thousands of followers.
- Major revision of Black Canyon Orientation Film.
- Currently producing Braille and large format version of the park's unigrid brochure.

Interpretive Operations:

- Established night sky programs in partnership with NPS Night Sky Programming office and local astronomy societies in both Gunnison and Montrose.
- Established Primary Interpretive Themes in consultation with Resource Stewardship and Science Division.
- Themes were also vetted through Foundations workshop.
- Long Range Interpretive Plan identifies nexus between interpretation and resource stewardship, highlighting ways to communicate issues and successes.
- Established annual meeting between Interpretation staff and Resources staff.

Information Technology:

- New satellite service at BLCA North Rim, South Rim and Cimarron.
- Extensive revision and conversion of websites to Content Management System and near daily updates.
- Webcams installed at both parks; popular with park users and local entities.

Visitor and Resource Protection:

- Expanded patrol capability using lightweight, packable rafts has greatly expanded the terrain rangers can cover.
- Winter grooming on the South Rim drive has greatly improved the opportunities for Nordic ski & snowshoe enthusiasts. Visitor feedback had been positive and enthusiastic.

Park Infrastructure

- Added FMSS specialist for Hub 3B (CURE, BLCA, GRSA, FLFO) and Field Project Manager (CURE, BLCA, GRSA, FLFO, CAVO, BEOL, SAND, BAND, MEVE).
- Implemented comprehensive recycling program to reduce solid waste disposal by approximately 20 percent.
- Implemented Spill Prevention Comprehensive Countermeasure Plan.

- Implemented an Integrated Solid Waste Management plan.

Buildings and Utilities

- Upgraded sewer facility including replacement of septic tanks and gravity sewer line.
- Corrected serious safety deficiencies on administrative building, including installation of state-of-the-art gutter ice melt system and dry wells.
- Improved housing, including replacement of sliding glass doors with low e models.
- Retrofitted water transportation truck to State of Colorado specifications.
- Performed U.S. Public Health Service and met or exceeded all standards for drinking water systems.
- Performed upgrades to nine water systems to meet State of Colorado drinking water regulations.
- Rehabilitated photovoltaic system providing power to the North Rim visitor contact station and employee housing.
- Rehabilitated North Rim visitor center, offices, and housing, including wood preservation treatment.
- Performed wood preservation treatment and stabilization on CCC buildings.
- Performed wood preservation treatment on log structures, including visitor center, kiosk, restrooms.
- Upgraded water well pump house at East Portal to meet State of Colorado drinking water regulations.

Roads, Trails, and Fleet

- In maintenance shop, upgraded and corrected safety deficiencies of parking lot.
- Administrative building parking lot expanded and restriped.
- Relocated cattle guards on main entrance road.
- Installation of new entrance gate on North Rim road, for winter closures.
- Major rehabilitation of the North Rim gravel road.
- Rehabilitated all overlook safety railing (wood).
- Performed pavement preservation and restriping on all asphalt park roads.
- Replaced major highway signs along Highway 50.
- Installed bear-proof garbage and recycling containers.
- Continued improvement and stabilization of parkwide trail system.
- Upgraded fleet with alternative fuel vehicles (flex fuel and electric).

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

Significant park-wide planning efforts in the last two years have resulted in a strategic view of BLCA's issues and challenges. These plans include: Housing Needs Assessment, Backcountry and Wilderness Management Plan, Foundation Document, and Long Range Interpretive Plan. In addition, the Servicewide Call to Action has suggested a number of opportunities to prepare for a second century of stewardship and citizen engagement, consistent with positioning the park for the centennial of the National Park Service in 2016.

Improving the condition of the park's natural and cultural resources

Climate change is an issue for all aspects of park management and operations, including natural and cultural resources, facilities, and visitor experience. Climate change response may also drive new partnerships. BLCA must manage the natural and cultural resources to increase resilience in the face of climate change. This includes conducting research to fill data and knowledge gaps, seeking funding to accomplish research needs as identified in the Resource Stewardship Strategy, and engaging citizen stewards in education activities at all levels. Specific issues associated with climate change include:

- The need to improve Gunnison Sage-grouse habitat resilience to the effects of climate change for the Crawford population;
- Potential for increased exposure and erosional impact to paleontological and archeological resources;
- Potential effects to rivers and streams resulting in impacts to water quality, river flow regimes, channel morphology, geomorphic processes, riparian vegetation, and aquatic species diversity and abundance;
- Potential effects to upland vegetation structure and increased potential for non-native species invasion;
- Management efforts to reduce the impacts of climate change may affect wilderness character;
- Potential climate change effects to the resilience of natural systems to other stressors (non-natives, pests, etc.);
- Potential for increased wildland fire activity;
- Management efforts to address potential climate change impacts to cultural resources.

The NPS must demonstrate excellence in science and scholarship to maintain and protect natural and cultural resources, including:

- Continue parkwide inventory of cultural resources and the completion of baseline documents;

- Document historic sites including the North Rim Civilian Conservation Corps spike camp and the discovery of the East Portal CCC camp location;
- Document and assist in the interpretation of the East Portal Townsite;
- Conduct ancillary studies for Ethnographic resources and Cultural Landscapes;
- Complete parkwide Paleontological inventory;
- Conduct bat surveys to detect potential sensitive species;
- Complete reptile and amphibian surveys.

The NPS must collaborate with other land management agencies and partners to create, restore and maintain landscape-scale resource integrity. Specific issues include:

- Continue the annual delivery of the Black Canyon water right;
- Protect adjacent lands in private ownership through cooperative conservation efforts with willing land owners;
- Cooperatively manage Gunnison Sage-grouse and their habitat across the North Rim landscape;
- Complete and implement the Wilderness and Backcountry Management Plan.

The NPS must demonstrate excellence in science and scholarship to maintain and protect designated wilderness and wilderness character. Specifically:

- Complete and implement the Wilderness and Backcountry Management Plan;
- Update the Wilderness Character Assessment every five years.

Improving the connection of people to parks

The NPS must connect people to parks by developing and nurturing a life-long relationship between the public and parks—especially for young people—through a continuum of experiences which include recreation, education, volunteerism, and employment. Issues specifically associated with connecting people to parks include:

- Expanding the use of the park as a place for healthy outdoor recreation that includes people's physical, mental and social well-being;
- Welcoming and engaging diverse communities through culturally relevant park education experiences;
- Expanding the park's education mission through distance learning, in-park interpretive and educational programs, and citizen-steward opportunities;
- Educating park users to the potential effects of climate change and the role they can play in mitigating impacts.

Improving the built environment for visitor and employee satisfaction

The NPS must improve and maintain a sustainable infrastructure to serve visitors and staff. Issues associated with improving infrastructure include:

- Reduce the park's carbon footprint and showcase the value of renewable energy;
- Improve and maintain facility conditions both for the public and the staff;
- Engage partner organizations to provide legacy support for the ongoing improvement of visitor centers, research labs and museum collection storage facilities;
- Improve visitor and employee safety through targeted training for staff and education for visitors. Seek funding to repair and replace aging infrastructure that poses hazards;
- Increase facility and programmatic accessibility.

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 Visitor Experience-Related References

Other Park Infrastructure-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, which ensures long-term maintenance of collections in specialized facilities.
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.
Northern Colorado Plateau Network (NCPN)	One of 32 I&M networks established as part of the NPS Inventory and Monitoring Program. The Northern Colorado Plateau Network provides scientific data and expertise for natural resources in 16 parks located in Colorado, New Mexico, Utah, and Wyoming.
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.
Wilderness	A designation applied to certain federal lands set aside for preservation and protection in their natural condition, in accordance with the Wilderness Act of 1964.