National Park Service
U.S. Department of the Interior

State of the Park Report

Curecanti National Recreation Area

Colorado

2014

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On the cover: Blue Mesa Reservoir at Curecanti National Recreation Area.

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.

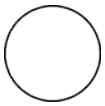
The purpose of Curecanti National Recreation Area (CURE) is to protect an abundance of natural, historic, and archeological features in a western landscape encompassing canyons, pinnacles, cliffs, rivers, reservoirs, and mesas, while offering opportunities for recreation, public benefit, and personal reflection.

Significance statements express why the park unit's resources and values are important enough to warrant national park unit designation. Curecanti National Recreation Area is significant because:

- Curecanti provides an array of recreational opportunities based on three high-altitude reservoirs, tied together by the Gunnison River, and set in the Rocky Mountains featuring a Kokanee salmon and lake trout fishery which draws recreationists from around the country.
- Blue Mesa Reservoir, cradled by mesas and iconic pinnacles within a high desert landscape, is the largest body of water in Colorado. Morrow Point and Crystal are two remote, fjord-like reservoirs located in the upper Black Canyon of the Gunnison that provide premier backcountry flat water recreational opportunities.
- Globally and regionally imperiled cottonwood-riparian woodlands found within Curecanti provide habitats for sensitive species such as Great Blue Herons and river otters.
- Eroded landscapes of Curecanti continue to reveal fossil rich exposures of Late Jurassic and Early Cretaceous paleoenvironments (160–100 million years ago) including the remains of at least six dinosaur genera found in the renowned Morrison formation.
- The association and density of archeological sites in Curecanti National Recreation Area provide physical evidence of 10,000 years of human adaptation to changing environments in the Gunnison River Basin.
- The continuum of human occupation is demonstrated through artifacts, structures, oral histories, and landscape modifications associated with traditional cultures, railroading, mining, ranching, irrigation, water storage, and hydropower development.

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

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

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

State of the Park Summary Table

Priority Resource or Value	Condition Status/Trend	Rationale
Natural Resources		web ▸
Air Quality		Estimated nitrogen wet deposition levels during 2005–2009 warrant significant concern based on NPS Air Resource Division benchmarks. Estimated ozone, average visibility, and sulfur wet deposition levels in the park during 2005–2009 warrant moderate concern.
Geological Resources and Soils		Many areas throughout CURE 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 geological hazards mapping or monitoring is currently in place or scheduled.
Geological Resources - Paleontology		Surveys have indicated that paleontological resources in the park are regionally significant and may prove to be internationally valuable. The potential for future significant discoveries is very high. Discovery and documentation of known paleontological localities has increased by about 200 percent in the last decade. Inventory efforts will continue with similar results expected. The zone with potential for significant future discoveries occurs in a highly erodible environment.
Gunnison River		The overall ecosystem of the Gunnison River remains healthy and fundamentally resilient to historic perturbations notwithstanding an observed downward trend in discharge rates and the historic introduction of non-native fish. The annual discharge of the Gunnison River is trending downward resulting from upstream storage projects and withdrawals; however, the magnitude of the trend is small. Water quality is considered exceptional with few exceedances for assessed water quality parameters. The abundance of non-native fish species likely dominates the native fishery; however, a healthy macro invertebrate community supports a high quality sport fishery.
Tributaries		Discharge from tributaries to the Aspinall Unit is diminished by withdrawals and diversion to private and municipal supplies, and affected by reservoir storage. Overall water quality is exceptional and many of these waterbodies were designated as Outstanding Waters in 2012 because of their persistent high quality water. These tributaries are healthy systems despite the predominant non-native fishery, lack any known aquatic invasive species, and have few water quality exceedances.

Priority Resource or Value	Condition Status/Trend	Rationale
Reservoirs		Streamflow conditions favoring water storage at the Aspinall Unit Reservoirs is good, though the annual inflow is trending downward. Overall water quality is exceptional. Natural influences cause seasonal exceedances of dissolved oxygen standards, temperature, manganese, and total phosphorus. Manganese and total phosphorus exceedances have similarities with Aspinall Unit tributaries that drain the West Elk Wilderness and are likely natural conditions. A productive reservoir food web and popular sport fishery have developed. The State of Colorado is making an effort to bring the kokanee salmon and lake trout populations in balance based on the best available reservoir aquatic science. There is no evidence of the existence of Aquatic Invasive Species (AIS), although concern is high. Aspinall Unit recreation is managed around the sport fishery and healthy food web.
Plant Communities		Although sagebrush communities in CURE are generally in good condition, the increase in invasive species, the negative trends in condition of the key cottonwood-willow riparian system along the Gunnison River, and struggling aspen stands warrant management concern. The cottonwood-willow riparian plant community is considered imperiled in Colorado and of utmost importance to the entire Gunnison River ecosystem. The increase in invasive species, high tree mortality and low sucker density are significant threats to CURE aspen stands. 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 likely similar to reference condition with the exception of three non-native species. Mammal species richness is also similar to historic reference condition with the exception of species largely extirpated from the western US: grizzly bears and wolves. All mammal species present are native. All reptile and amphibian species present in the park are native and species richness is likely the same as historic reference condition.
Special Status Species		Peregrine Falcon populations are stable or increasing. The Gunnison Basin population of Gunnison Sage-grouse is stable, but greatly declined from historic levels. Likely, all 16 bat species expected to inhabit CURE are present, but additional surveys are necessary to confirm their presence. No current population estimates exist, but river otter and their sign continue to be sighted in CURE after their reintroduction during the 1970s. Bighorn sheep populations are stable and elk populations are being managed to obtain sustainable levels.
Dark Night Sky		The measure of anthropogenic sky luminance for the CURE 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		Primary noise sources at CURE include jet aircraft, automobile, and boat traffic. A significant portion of the park is situated in close proximity to U.S. Highway 50, a major east-west traffic thoroughfare. In addition, aircraft can be heard quite frequently from many locations and the park plays host to motorized watercraft, one of the primary recreational activities.
Landscapes and Ecosystems Processes		Habitat loss is the single greatest threat to almost every species of concern in the CURE 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 over the past decade and housing development has remained essentially unchanged for the same period.

Priority Resource or Value	Condition Status/Trend	Rationale
Cultural Resources		web ▸
Archeological Resources		The NPS is accomplishing slow, but steady progress towards a complete archeological survey of the park area. Historic testing of sites provides basic knowledge of resources.
Cultural Anthropology		Only one narrowly focused ethnographic study has been conducted within the park, and the ethnographic relationship to the park is poorly understood.
Cultural Landscapes		No cultural landscapes have been evaluated.
Historic Structures		Of ten historic structures in the park, eight are listed in the National Register of Historic Places. 100 percent (8 of 8) of historic structures on the List of Classified Structures are listed on the National Register of Historic Places.
History		Historians in the area have been conducting historical research that is relevant to the park. The park continues to compile primary materials. All eight of the park's historic structures on the List of Classified Structures are listed on the National Register of Historic Places.
Museum Collections		The park's Scope of Collection statement is current and accurate. Fifty-five percent of the known objects and archives have been catalogued (more than 100,000 of the uncatalogued items are archival materials).
Visitor Experience		web ▸
Visitor Numbers and Visitor Satisfaction		Visitation remains steady and within the five-year average. Visitor satisfaction surveys show consistently high results.
Interpretive, Education Programs, and Community Outreach		Currently all programs and public outreach are very popular with demand exceeding capability. There is concern that 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.
Recreational Opportunities		The park provides for a variety of year round recreational opportunities, centered on Blue Mesa Reservoir.
Accessibility		Though the park has addressed many physical access concerns, more information is needed regarding best practices for media development.
Safety		Visitor safety, as indicated by the number of accidents and injuries and law enforcement incidents, is low.

Priority Resource or Value	Condition Status/Trend	Rationale
Volunteers and Partnerships		The park has dynamic and active 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 for 337 locations at CURE was 0.079 in FY 2012, 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 23.3 percent lower than the average for the previous four years (Source: NPS Annual Energy Report).
Water Consumption		Water consumption at the park in 2012 was 8.4 percent higher than the four-year average for 2008–2011 (Source: NPS Annual Energy Report).

Summary of Stewardship Activities and Key Accomplishments to Maintain or Improve Priority 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 in the protection of water quality with local stakeholders.
- Obtained designation of Outstanding Waters for select park tributaries.
- Participate with Gunnison Climate Working Group to develop vulnerability assessments and adaptation strategies for the Gunnison Basin.
- Worked with the Northern Colorado Plateau Network to implement long-term monitoring of uplands, Gunnison River, invasive plants, landbirds, climate, air quality, landscape dynamics, and land surface phenology as well as streamlined data management and reporting for water quality.
- Completed 12-year habitat use and nest survival study for Gunnison Sage-grouse in cooperation with USGS to complete three publications on habitat modeling and nest survival.
- Cooperate in interagency effort with USFS, BLM, and USFWS, to complete the Gunnison Sage-grouse Candidate Conservation Agreement.
- Participate in interagency and private citizen conservation planning with the Gunnison Basin Gunnison Sage-grouse Strategic Committee.
- Repair and maintain historic ditch and water right for weed control and restoration of Elk Creek area.
- Monitor Gunnison's prairie dog colonies; prevent plague epizootic events through treatment of fleas.
- Installed bear-proof food storage lockers and completed bear management and response strategy.
- Monitor Peregrine Falcon territories and associated climbing closures in occupied territories.
- Cooperate with local entities to control invasive weeds.
- Developed fire management plan that provides for the use of fire to meet resource management objectives.
- Increased paleontological collections through survey and monitoring.
- Implemented mandatory watercraft inspection program to prevent the infestation of aquatic invasive species.

Cultural Resources

- Developed scope of collections.
- Conduct oral history interviews.
- Initiated major archival effort for up to 200,000 records.
- Evaluated prehistoric rock art site.

- Restored historic steam locomotive and tender.
- Listed eight railroad cars on the National Register of Historic Places.
- Maintain national databases such as ASMIS and LCS.

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; they are housed on the park website and You Tube.
- Currently working on Wayside Exhibit Plan.
- Upgraded and standardized all bulletin boards.
- Established presence on Facebook/Twitter/YouTube—thousands of followers.

Interpretative 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:

- Replaced entire CURE phone system.
- New satellite service at 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, used by many for weather and boating activities.

Visitor and Resource Protection:

- Increased LE presence on reservoirs coupled with complimentary vessel safety inspections had led to a decrease in boating related accidents.

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.
- Procurement and installation of a hazmat storage facility through the regional Environmental Management Program.

Buildings & Utilities

- Diverse remodeling projects which provided needed improvements to park dorms and housing units.
- Installed Energy Star appliances and products in all housing units.
- Performed upgrades to nine water systems to meet State of Colorado drinking water regulations.
- Performed rodent proofing of park buildings to reduce risk of hantavirus.
- Replaced over 5,000 light bulbs with energy efficient bulbs, and replaced fixtures with more efficient models, resulting in a reduction of energy consumption of 25 percent.
- Installed night sky friendly outdoor light fixtures.
- Upgraded main power center for a cluster of administrative and maintenance buildings for improved electrical service and safety, along with energy efficiency.
- Safety improvements at Elk Creek propane farm.

Roads, Trails, Fleet & Marina

- Chip-sealed and restriped all paved roads and parking lots in park.
- Procurement and upgrade of boat fleet to meet EPA 2006 emissions standards for four-stroke engines.
- Marina facility improvements, consisting of breakwater replacement and floating restrooms, resulting in improvement in visitor experience.
- Continued improvement and stabilization of parkwide trail system.

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 CURE'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. CURE must manage 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 Gunnison Basin population;
- Potential for increased exposure and erosional impact to paleontological and archeological resources;
- Potential effect to reservoir water levels resulting in impacts to the fishery, reservoir foodweb dynamics, water quality, and flat water recreational boating;
- 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;
- Potential climate change effects to the resilience of natural systems to other stressors (non-natives, pests, etc.);
- Potential for increased wildland fire activity;
- Potential for effects to historic structures and cultural landscape elements.

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

- Continue parkwide inventory of cultural resources and the completion of baseline documents;
- Continued efforts to repair and restore historic railroad resources;
- 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:

- Prevent the infestation of park waters by aquatic invasive species;
- Finalize Congressional legislation to establish an authorized boundary for CURE;
- Protect adjacent lands in private ownership through cooperative conservation efforts with willing land owners;
- Cooperatively manage Gunnison Sage-grouse and their habitat across the Gunnison Basin landscape;
- Implement the motorized vehicle access regulations;
- Complete and implement the Wilderness and Backcountry Management Plan.

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 Curecanti National Recreation Area (CURE) is to assess the overall condition of the park's priority resources and values, to 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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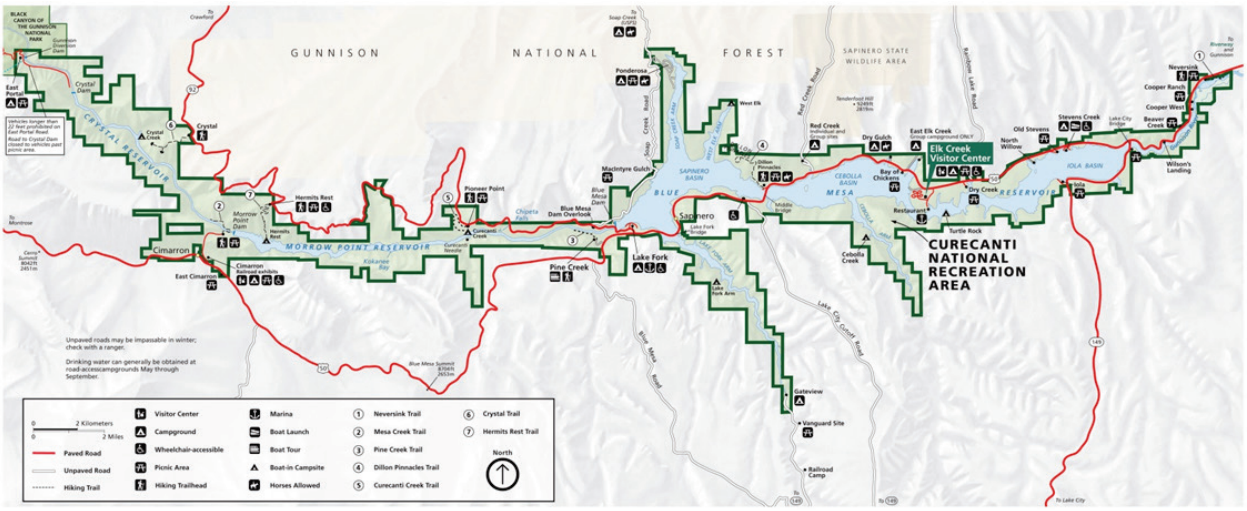


Map of the Park

Location of the Park in Colorado

Chapter 2. State of the Park

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

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

from their being involved in the day-to-day practice of all aspects of park stewardship and from the professional experience of the participating subject matter experts. This expert opinion and professional judgment utilized available factual information for the analyses and conclusions presented in this report. This State of the Park report was developed in a park-convened workshop.

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

2.1. Natural Resources

Air Quality

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 CURE was 68.3 ppb; therefore, the condition status 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 0.6 kg/ha/yr. This level usually indicates that a resource is in good condition based on NPS Air Resource Division benchmarks. However, at CURE, the condition is elevated to moderate concern because a risk assessment concluded that ecosystems at CURE may be very highly sensitive to acidification effects from atmospheric deposition relative to all Inventory & Monitoring parks (Sullivan et al. 2011a; Sullivan et al. 2011b). No trend information is available because there are not sufficient nearby wet deposition monitor data (NPS ARD 2013).
	Nitrogen Wet Deposition (kg/ha/yr)		During 2005–2009, estimated wet nitrogen deposition was 1.1 kg/ha/yr. This level usually indicates a condition status warranting moderate concern based on NPS Air Resource Division benchmarks. However, at CURE, the condition is elevated to significant concern because a risk assessment concluded that ecosystems at CURE may be very highly sensitive to nitrogen-enrichment effects relative to all Inventory & Monitoring parks (Sullivan et al. 2011c; Sullivan et al. 2011d). No trend information is available because there are not sufficient on-site or nearby wet deposition monitor data (NPS ARD 2013).

Visibility	Haze Index (deciviews (dv))		During 2005–2009, estimated average visibility in CURE was 3.2 dv above natural conditions, therefore, the condition status 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.

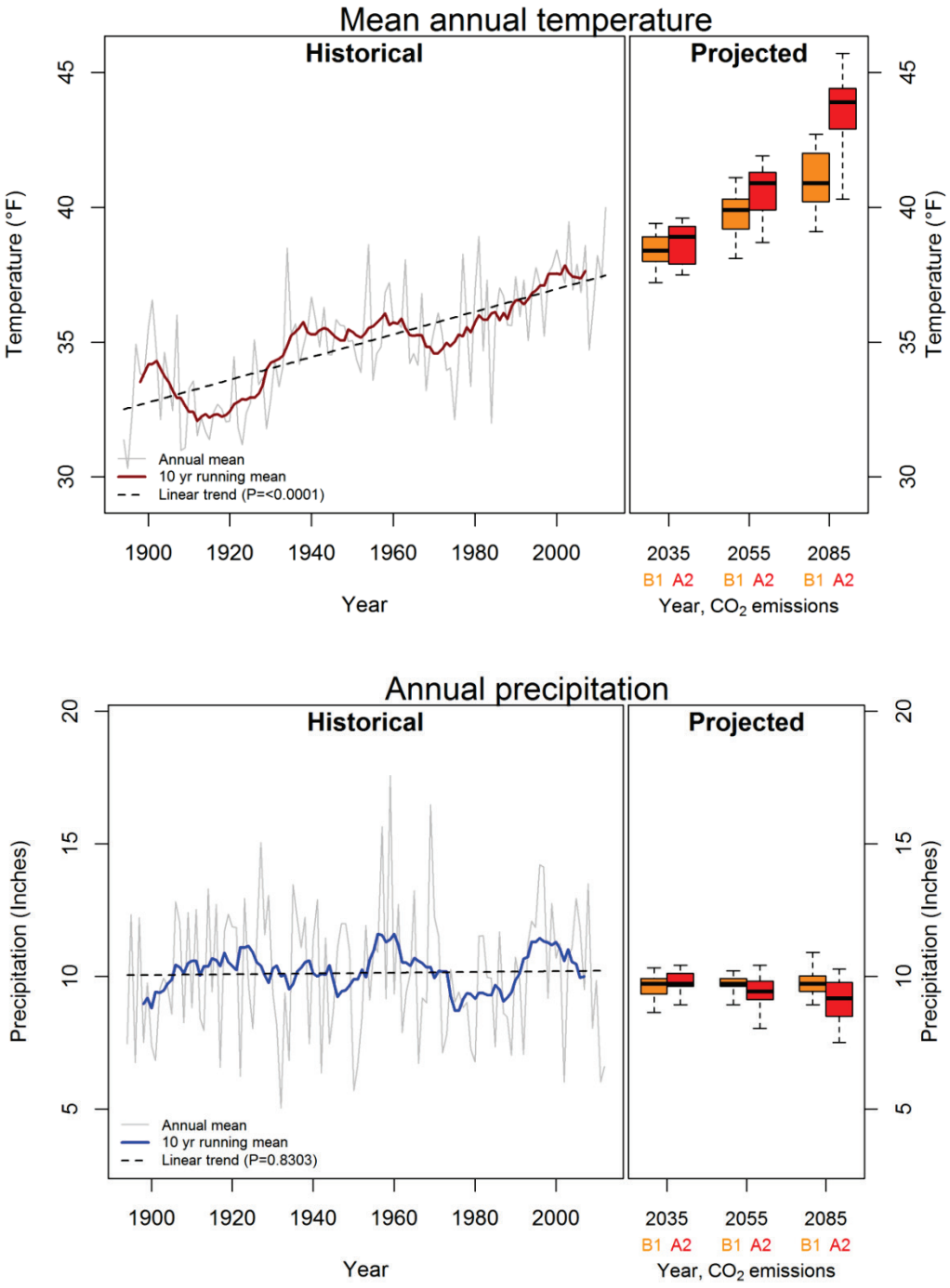
Resource Brief: Historical and Projected Changes in Climate at Curecanti National Recreation Area

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 (1894–2012)
Historical climate trends for CURE (Fisichelli 2013) are based on historical climate data from a nearby long-term weather station (Gunnison, CO; cdiac.ornl.gov). Over the 119 year instrumental record (1894–2012) mean annual temperature showed a significant warming trend, +0.4 °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 CURE 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 CURE. Historical data (1894–2012) are from the Gunnison, 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.

Resource Brief: Managing for Climate Change – A Collaborative Approach

Climate change is already affecting ecosystems and people in the southwestern United States and is projected to have an even greater impact in coming decades. Rising temperatures pose serious threats to ecosystems and species, e.g., changes in water flows, larger and more severe fires, widespread insect outbreaks and forest dieback. The climate of the Gunnison Basin, Colorado, is projected to get warmer over the next few decades as part of a larger pattern of warming in the western United States. Land managers need to understand both past and potential future impacts of climate change on land and water resources to help inform management and conservation activities.

Resource managers at CURE and Black Canyon of the Gunnison National Park (BLCA) joined forces with The Nature Conservancy and other public and private partners to develop the Gunnison Climate Working Group (Working Group) in 2010. The goals of the Working Group are to 1) increase understanding of the threats posed by climate change to plants, animals, ecosystems, and the benefits they provide to the Gunnison Basin community; 2) identify priority strategies for helping people and nature cope with climate change; and 3) promote the coordinated and effective implementation of these strategies across jurisdictional boundaries.

View of Iola Basin during 2002 Drought

The Working Group completed a comprehensive climate vulnerability assessment for the Gunnison Basin in December 2011 that identified species and habitats most at risk to climate change. The Working Group also initiated implementation of an on-the-ground climate adaptation project to help wetland and riparian areas retain water, thereby enhancing the resilience of this critical habitat in the face of a changing climate. The Working Group further intends to identify priority strategic actions to address climate change within the Gunnison Basin and develop tools and information that natural resource managers can use to make current programs and projects "climate smart".

The Working Group is collaborating with the Southwest Climate Change Initiative (SWCCI), whose aim is to provide climate adaptation information and tools to conservation practitioners in Arizona, Colorado, New Mexico and Utah. The Gunnison Basin is one of four SWCCI landscapes developing and testing ways to sustain natural resources in a changing climate.

Geological Resources and Soils

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Geologic forces shape the dynamic landscape of CURE and continue to reveal scenic vistas, unique rock exposures, and paleoenvironments. This foundation includes panoramic mesas, fjord-like reservoirs, and a deep, steep, and narrow canyon. The major park icons are all geologic features; Dillon Pinnacles, Curecanti Needle, and the Black Canyon.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory Products	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,	Percent of Geohazards Mapped/Monitored		Steep slopes, intense seasonal storms, little vegetative cover and snow-melt all contribute to episodes of slope instability and erosion. Rockfall, slump landslides and debris flows can cover or

Swelling Clay)			destroy park infrastructure (roads, trails, buildings) causing potential disruption of access and visitor safety impacts. Additionally, rockfall or landslides into reservoirs could cause a displacement wave potentially dangerous to recreation users and dams. Mancos, Morrison, Entrada, Dakota, and Burro Canyon Formations are prone to failure when undercut by roads or trails. High potential exists for slides along US Highway 50 and Colorado Hwy 92. Swelling clays present in several of the geologic formations that underlie the recreation area also pose a threat to slope stability. 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: Geological Offerings at Curecanti NRA

Curecanti National Recreation Area lies within a geologic backdrop of sweeping mesas, dramatic pinnacles, and a stunning canyon. The geologic history is a story of vast geologic time spanning back 1.8 billion years to modern day erosion. The rocks reveal ancient environments very different from today including past oceans, beaches, and river channels.

Ancient volcanic activity (around 30 million years ago) is highlighted in CURE's most prominent feature, the Dillon Pinnacles. The volcanic rocks comprising the pinnacles tell the story of two enormous volcanoes that once loomed over this landscape. Erosional processes are still, today, revealing more of that story and creating visually impressive pinnacle formations.

The uppermost portions of the Black Canyon of the Gunnison are located within CURE. Geologic variations in this section are noteworthy, providing geologists with more opportunity to understand the Black Canyon as an entire feature. Erosion and faulting have created one of the park's icons, the Curecanti Needle.

Sedimentary rock layers with the Dillon Pinnacles in the background

Geological Resources - Paleontology

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	Percent of area of known Fossil bearing Geologic Units Adequately Surveyed		Less than 50 percent of known fossil bearing units within the park have been surveyed. Fossils are non-renewable resources and help to provide important information about the Earth's history. All 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. Cursory surveys have already indicated that paleontological resources in the park are regionally significant and may also prove to be internationally valuable. The potential for future significant discoveries is very high.

Documentation	Paleontological Resource Inventory and Monitoring Report		Tweet et al. 2012 provides a detailed review of CURE paleontological resources. Fossils are most commonly found within CURE in the Morrison Formation, Dakota Sandstone, or Mancos Shale. Fossil bearing blocks of Morrison Formation along Blue Mesa Reservoir contain dinosaur bones and teeth. New discoveries are common. See: Tweet, J. S., V. L. Santucci, T. Connors, and J. P. Kenworthy. 2012. Paleontological resource inventory and monitoring: Northern Colorado Plateau Network. Natural Resource Technical Report NPS/NCPN/NRTR—2012/585. National Park Service, Fort Collins, Colorado.
	Percentage of Known Sites with Adequate NPS and Colorado Office of Archeology and Historic Preservation Documentation		Currently the park staff has adequately documented 27 paleontological localities. No additional sites have been discovered. Therefore 100 percent of the localities have adequate documentation.
Condition	Percentage of Paleontological Localities Documented in Good Condition using the NPS Paleontological Condition Assessment Form		The National Park Service paleontological condition assessment form provides a numerical rating on site condition and then categorizes the condition as poor, fair, or good. The form considers both natural and human threats affecting site stability. Management remediation efforts are captured in the assessment as well. There are 27 total sites and completed condition assessment forms exist for all of them on an updated monitoring cycle of five years. There are four “Poor” sites and 23 “Fair” sites.
High Erosion	Percent of Area of Known Paleontological Localities that Occur within Zones of High Erosion that are Actively Monitored		Several known localities exist within a zone of very high erosion rates. Those localities considered significant by park staff are currently visited on an annual basis. These sites are included in the formal monitoring documentation that occurs on a five year cycle. The ability to monitor is dependent upon local environmental conditions.

Resource Brief: Paleontological Discoveries at Curecanti NRA

The study of dinosaurs has fascinated generations of curious minds. It had long been known that the rock layers in CURE have a high potential for fossil occurrence. During the 1990s CURE was included in a multi-state study of the Morrison Formation (156 to 145 million years old), resulting in the first dinosaur fossils discovered in the park. Since 2005, the park’s Paleontology Program has conducted two summers of survey activity. The surveyors have revisited or recorded 29 fossil locations.

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 insects and larger animals; termite nests; pinecones of early sequoia trees; maple and willow leaf impressions; crocodile and turtle bones; and bones from six types of dinosaurs.

In coming 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.

Possible Sequoia cone from the Cretaceous time period

Fragmentary dinosaur bones washed into an ancient stream bed

Gunnison River

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Stored Gunnison River and tributary stream water is the principal natural resource supporting recreation and aquatic ecosystems at CURE. 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. CURE 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. Fishery resources in the river, reservoirs, and tributaries are managed primarily by Colorado Parks and Wildlife (CPW) in cooperation with the NPS.

The Gunnison River and its tributaries are snow melt dominated streams. Several important characteristics define the hydrologic setting including the dominant portion of the annual precipitation, about 70 percent, falls in the cold season (October through April). The river is fed by water originating from many small catchments located at high altitudes. High altitude catchments are characterized by an extended period below freezing temperatures and the precipitation falling on them occurs predominately as snow. The extended cold period allows for the season-long accumulation and storage of snow. Rising spring temperatures cause rapid snow melting with the subsequent rapid release of the stored water. Gunnison River hydrology is characterized by an extended winter low flow season; a large magnitude spring season peak flow; and a summer-season recession flow. The three elements of the hydrology are essential to aquatic life and recreation at CURE.

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Quantity	Median Annual Discharge (acre feet (af)) Median Seasonal Discharge (af) Magnitude of Peak Discharge (cubic feet per second (cfs))		The annual Gunnison River discharge volume is trending downward. This trend is driven by two conditions. First, the median value of annual natural discharge for the Gunnison River for the period 1906 through 2008 is characterized by a downward trend, in part because the period 1905 through 1925 was consistently wet. Since about 1925, however, the trend slope for the natural discharge record is nearly zero. Second, the gage record for the period 1945 through 2012 shows a more pronounced downward trend in annual discharge, although this trend is also not significantly different than zero. The practical meaning is that while on-going water development has affected annual discharge the effect is not sufficiently large to imply a change in the hydrologic processes that generate Gunnison River flow.

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 Gunnison River is fundamentally resilient to historic perturbations related to water quality and few, if any, exceedances exist for water quality parameters. Reference conditions of water quality parameters determined by: (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		Since the arrival of European Settlers, the Gunnison River has been impacted by fundamental changes to biodiversity including the introduction of non-native sport fish that have outcompeted native species. The abundance of non-native fish species likely dominates the native fishery; however, a healthy macroinvertebrate community supports a high quality non-native sport fishery.

Tributaries

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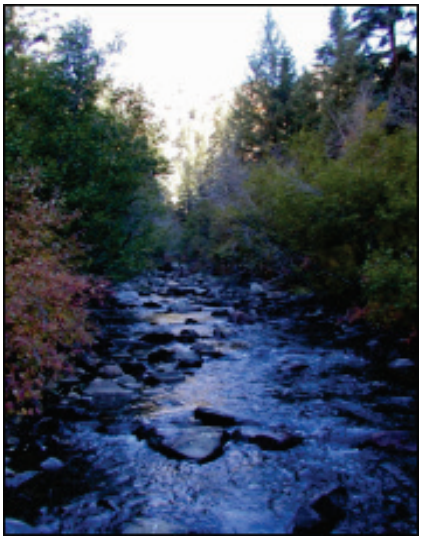
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Quantity	• Median Annual Discharge (af) • Median Seasonal Discharge (af) • Magnitude of Peak Discharge (cfs)		Tributary source annual discharge is trending downward; however, the magnitude of the trend is small and probably not significantly different from zero. The reconstructed annual natural discharge for the Gunnison River above Black Canyon for the period 1905 through 2008 is characterized by a downward trend and this trend is expected to apply to discharge in the tributary streams. The gage record, however, for the period, 1945 through 2012 shows a downward trend, but not significantly different from zero. This is believed to indicate larger volume water diversions were in place before 1945 and that water use has increased only slowly during this period.
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 overall condition of water quality for tributaries draining into the Aspinall Unit is exceptional. Many of these waterbodies were designated as Outstanding Waters in 2012 by the Colorado Water Quality Control Commission because of their persistent high quality water. Most of these tributaries drain relatively unimpacted or low impacted watersheds that were historically volcanic. Few unexpected exceedances exist except for *E. coli* at several sites. Reference conditions of water quality parameters determined by: (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		Most tributaries to the Aspinall Unit drain relatively small watersheds with very little aquatic habitat administered by the NPS. These tributaries are relatively healthy systems despite the predominant non-native sport fishery. No known aquatic invasive species are present. Prior to European settlement these systems would have been dominated by a native fishery.

Resource Brief – Outstanding Waters Designation for Park Tributaries



Curecanti Creek; an Outstanding Water

It is the policy of the National Park Service to perpetuate water as an integral component of park ecosystems, and to avoid whenever possible, the pollution of park waters from human activities occurring from within and outside of parks. CURE recently fulfilled this policy by petitioning the water quality rulemaking body in Colorado (Water Quality Control Commission) for the highest protection of water quality possible under the Clean Water Act and State Regulations. Outstanding Waters is a designation that preserves high quality streams, rivers, and lakes at their current quality. CURE aquatics program staff has maintained a rigorous water quality program for over 20 years and has researched the possibility of an Outstanding Waters designation through data collection and analysis, and outreach and education. Cutting edge collection and analysis methods were used to assemble a high quality dataset that specifically addressed the needs of the Water Quality Control Commission, and it was determined that the vast majority of rivers, streams, and reservoirs throughout CURE met these criteria. A significant, stepwise outreach and education process began 18 months prior to the hearing deadline and included federal, state, and local governments, water and ranching interests, as well as private landholders. Throughout the process the proposal was refined to meet the needs and concerns of these stakeholders and was eventually brought before the Water Quality Control Commission in September of 2012 with support from numerous entities. CURE Resource Stewardship and Science staff attended a day-long hearing, provided testimony, and the proposal was adopted to include the Outstanding Waters designation from North Beaver Creek to Meyer's Gulch (except Steuben, Soap, and Willow Creeks) draining the West Elk Wilderness area to Blue Mesa and Morrow Point Reservoirs. This proposal doubled the area of non-Wilderness Outstanding Waters in the State of Colorado and the Water Quality Control Commission commended National Park Service staff for the level of outreach and collaboration that was conducted to ensure a successful proposal. The Outstanding Waters designation will ensure that high quality water will be perpetuated as an integral part of CURE for the enjoyment of future generations.

Reservoirs

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Quantity – Blue Mesa	Annual and Seasonal Discharge to Blue Mesa Reservoir (af)		Discharge to the Aspinall Unit reservoirs is trending downward for the period 1905 through 2012. The downward trend is driven by two conditions. First, the reconstructed annual natural discharge for the Gunnison River system above the Gunnison Tunnel is characterized by a downward trend, but since 1925 that trend slope has been nearly zero. Second, superimposed on the natural-record is the effect of increasing upstream water diversion and storage. The value of the downward trend is strengthened by the fact that observed volume flowing into Aspinall is diminished by consumption and upstream storage, and a growing demand for water. In addition, the reservoirs lose water to evaporation.

Water Quality – Blue Mesa	• Dissolved Oxygen (mg/L) • pH • Temperature (°C) • Metals (µg/L) • Indicator bacteria (CFU/100mL) • Nitrogen species (mg/L) • Total phosphorus (mg/L) • Secchi depth (ft) • Chlorophyll a (mg/L)		Despite probable natural influences that cause seasonal exceedances of dissolved oxygen, temperature, manganese (drinking water), and total phosphorus, the overall water quality of Blue Mesa Reservoir is exceptional. Manganese and total phosphorus exceedances have similarities with Aspinall Unit tributaries that drain the West Elk Wilderness. Although no direct research has been done, based on best professional judgment these are likely natural conditions. Reference conditions of water quality parameters determined by: (Colorado Department of Public Health and Environment 2012)
Biodiversity – Blue Mesa	Occurrence/Abundance/ Species Richness of: • Aquatic Invasive Species • Periphyton and Macroinvertebrates • Native and Non-native Fish		Despite the fundamental alteration to the Gunnison River and the loss of native fish habitat by the construction of Blue Mesa Dam, a highly productive reservoir food web and popular sport fishery have developed. An effort to bring the kokanee salmon and lake trout populations in balance is based on the best available science. No results show presence of AIS, although concern is high. Blue Mesa Reservoir is managed for a sport fishery and a healthy food web.
Water Quality – Morrow Point & Crystal	• Dissolved Oxygen (mg/L) • pH • Temperature (°C) • Metals (µg/L) • Indicator bacteria (CFU/100mL) • Nitrogen species (mg/L) • Total phosphorus (mg/L) • Secchi depth (ft) • Chlorophyll a (mg/L)		Overall water quality of Morrow Point and Crystal Reservoirs is exceptional. Few, if any, parameters exceed state standards, and where exceedances do occur they are seasonal. Reference conditions of water quality parameters determined by: (Colorado Department of Public Health and Environment, 2012)
Biodiversity – Morrow Point & Crystal	Occurrence/Abundance/ Species Richness of: • Aquatic Invasive Species • Periphyton and Macroinvertebrates • Native and Non-native Fish		Intensive research and monitoring indicates that Morrow Point and Crystal Reservoirs are oligotrophic water bodies, with short retention times, and no nuisance algae or AIS species. A non-native sport fishery exists in both reservoirs. Neither reservoir is stocked, nor does much data exist on current fish populations.

Resource Brief: Prevention and Containment of Aquatic Invasive Species

CURE began public education efforts to prevent the infestation of invasive quagga and zebra mussels and monitoring to detect the presence of these mussels in 2004. A comprehensive, pro-active aquatic invasive species (AIS) program was implemented in 2009 to prevent the infestation and spread of zebra and quagga mussels and other aquatic invasives, after scientists predicted Blue Mesa Reservoir to be at risk of infestation.

Quagga and zebra mussels are non-native species which have invaded many waters in the United States. These invasive mussels have had significant negative impacts to aquatic ecosystems, water delivery and withdrawal infrastructure, power production, and local economies. The current annual cost of managing this program at CURE exceeds $350,000. The Park has successfully partnered with

local communities, CPW, neighboring agencies and national mussel prevention campaigns to develop and meet AIS prevention and containment standards.

This interdisciplinary approach is guided by an integrative prevention and response plan. All motorized watercraft launching on and retrieving from Blue Mesa Reservoir must be inspected and all watercraft found to be at risk of transporting invasive mussels are decontaminated. Watercraft launch ramps have structured hours with support and cooperation from boaters. Monthly plankton samples are examined and analyzed for mussel larvae, fixed substrates are examined for adult mussels, and SCUBA surveys are performed at high risk sites.

The Park continues to seek funding to support the growing financial demands of sustaining an AIS program and to continue to protect the Park's aquatic resources.

Park staff sample for larval mussels

Plastic pipe recovered from infested waters, encrusted with quagga mussels

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 704 plant taxa representing 89 families for CURE. Ninety-three (13.2 percent) are non-native species, 23 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 15 are considered species of concern by the state natural heritage program. Ten and 28 species are local and regional endemics, respectively.
Invasive Plants	Infestations of Invasive Plants		In the developed Elk Creek sagebrush area there were 6.89 infestations of priority invasive plants per ha. Infestation rates along the reservoir high water mark were 1.38 infestations per ha (Edvarchuk et al. 2012, Perkins 2013). These data are from disturbed areas and it is likely that rates are lower in areas away from disturbed areas, but there is no data available (Edvarchuk et al. 2012, Perkins 2013).
Aspen	• Percent Cover of Invasive Plants • Species per Plot • Percent Overstory Canopy Closure • Aspen Overstory Tree Density		There was 38.2 percent cover of invasive plants in upland aspen plots from 2008 to 2011(Witwicki 2010, 2012, 2013). There were 27.1 species per plot in aspen stands from 2008 to 2011 (Witwicki 2010, 2012, 2013). There was 51.0 percent overstory canopy closure in aspen stands from 2008 to 2011 (Witwicki 2010, 2012, 2013). There was an average of 427 overstory trees per ha in data collected from 2008 to 2011 (Witwicki 2010, 2012,

	• Aspen Sucker Density • Aspen Canopy Health Index		2013). There was an average of 1,213 suckers per ha in data collected from 2008 to 2011 (Witwicki 2010, 2012, 2013). An average of 51 percent of overstory aspen trees were dead from 2008 to 2011 (Witwicki 2010, 2012, 2013).
Riparian Vegetation	• Infestations and Percent Cover of Invasive Plants • Cottonwood Canopy Health Index • Species Richness		Along riparian areas there were 1.5 priority invasive plant infestations per ha in 2010 and invasive plant cover was highest along the Blue Mesa Shoreline with an estimated cover of 4.1 percent (Perkins 2013). The average canopy health in 2012 was 2.0 (50–89 percent live) with 21 percent of the trees with less than 50 percent of their crown health alive. Thirty-three species, seven of which (18.7 percent frequency) were exotic species were found during point-intercept work in 2012. No major riparian species are missing.
Sagebrush	• Infestations and Percent Cover of Invasive Plants • Large Canopy Gaps • Species per plot • Percent Shrub and Perennial Grass Cover • Soil Stability		There was a total of 1.4 percent cover of exotic plants in sagebrush stands from 2008 to 2011 (Witwicki 2010, 2012, 2013; pooled data from BLCA and CURE). 4.5 percent of canopy gaps detected were larger than 200 cm from 2008 to 2011 (Witwicki 2010, 2012, 2013). There were 17.3 species per plot in sagebrush shrublands from 2008 to 2011 (Witwicki 2010, 2012, 2013). There was 33.1 percent shrub and 23.4 percent perennial grass cover in sagebrush shrublands from 2008 to 2011 (Witwicki 2010, 2012, 2013; pooled data from BLCA and CURE). Soil stability averaged 2.8 in plots collected from 2008 to 2011 (Witwicki 2010, 2012, 2013), however, there is little unprotected soil (less than ¼ of surface cover) in sagebrush shrublands at BLCA and CURE.

Resource Brief: Restoring a Wetland

In 2005, the National Park Service was awarded a Colorado Wetlands Program grant to restore CURE wetlands that included state-imperiled narrowleaf cottonwood-willow riparian plant communities along the Gunnison River. A 40-acre former hay meadow island within the Gunnison River channel and the surrounding floodplain was targeted for restoration in the Cooper Ranch and Neversink visitor day-use areas. Concerns at the site included large infestations of noxious weeds including Canada thistle and yellow toadflax, and no recruitment of cottonwood or willow suckers on the 40-acre island due to the dense weed cover.

Locally-collected willow and cottonwood seedlings were purchased from the Colorado State Forest Service facility in Gunnison and planted by NPS staff and community volunteers, Student Conservation Association interns, and Western State Colorado University (WSCU) students beginning in September 2005. Irrigation water from the Gunnison River was purchased through an Interagency Agreement with the Bureau of Reclamation. Over 20,000 willows and cottonwoods were planted through fall of 2007 and irrigation of drier plantings continued through the summer of 2011. Monitoring of the restoration site has shown a 30 percent average survival rate across planting plots and some trees were measured at over 8 feet tall in 2012.

Cooperative weed control efforts with the Gunnison Watershed Weed Commission (Gunnison County) have significantly reduced the Canada thistle and yellow toadflax infestations in the area. Eleven acres of noxious weeds were treated in 2012, down from 29 acres treated in 2002. Grasses and native sedges and rushes have especially flourished on the island with the removal of dense weed cover. NPS staff and WSCU will continue to monitor and learn from this restoration site well into the future.

Wildlife Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Amphibians and Reptiles	Species Richness		Hammerson (2005) found two amphibians and nine reptiles at BLCA and CURE and stated that these results were not surprising. Two amphibian and six reptile species are listed as present or probably present in NPSpecies for CURE.
Birds	• Overall Species Richness • Species Richness in Sagebrush and riparian habitat		Giroir (2004) recommended that CURE 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 264 species as present or probably present at CURE, 121 of those birds are native residents.
Mammals	Species Richness		Haymond et al. (2003) documented 17 species of small mammals and 14 meso- and large mammals. NPSpecies currently lists 61 mammal species as present or probably present at CURE. All of these species are native.

Special Status Species

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Peregrine Falcon	• Number of Occupied Eyries • Fledging Rates		NPS conducts Peregrine Falcon surveys at each of three known territories in CURE and results from these observations show the peregrines in the park continually occupied known nest sites. While individual nests have failed on occasion, each year the number of fledged Peregrine Falcons is greater than the number of nesting adults (Reese 2012). Protections for peregrine 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 CURE region.
Gunnison Sage-Grouse	Population Estimate Indices		Gunnison Sage-grouse (GUSG) have a very restricted range; seven geographically separated populations remain in Colorado and Utah. Only two NPS units are occupied by GUSG, CURE and BLCA. The Gunnison Basin population is the largest in number (2012 population estimate = 4,082 breeding individuals) and geographic area (240,000 ha) (CPW 2012, USFWS 2013). GUSG habitat within CURE encompasses two percent of the Gunnison Basin population range. GUSG population monitoring is accomplished through lek counts, which provide an index of abundance, rather than a defensible estimate of population size (GSRSC 2005). Therefore, the utility of population indices is in demonstrating population trends. While the Gunnison Basin population trend has shown variability over the past 12 years, the population has remained relatively stable over this period (CPW 2012). Gunnison Basin population indices exhibit a slightly increasing trend over the last five years (CPW 2012). On January

			10, 2013, the USFWS proposed listing the species as endangered (USFWS 2013).
Great Blue Heron	• Number of Nests • Number of Chicks (Pre-Fledging)		The Great Blue Heron rookery in and immediately adjacent to CURE once averaged 75 occupied nests/year, but experienced a precipitous decline from 1993 to 1997, when the number of occupied nests decreased to just 17. This decline was likely due to increased human disturbance (Meyer, pers. Comm.). This colony has exhibited recovery, with a slightly increasing trend in the number of occupied nests between 1997 and 2008, but again exhibited a precipitous decline in 2009. No observations have been recorded since 2009.
Bats	Species Occurrence		Haymond et al. (2003) documented presence of seven bat species in CURE. Recently, CURE staff has confirmed the presence of 12 bat species using remote acoustic survey methods (Frey 2012). Four species likely occur in CURE, but acoustic detections were inconclusive (Frey 2012). Six of these species are known to inhabit CO year-round, three are summer residents, and little is known about the natural history of three of these species. Townsends' big-eared bat populations are declining. This 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.
Bighorn Sheep	Abundance		The 'Dillon Pinnacles' herd is comprised of descendants of two different reintroduction efforts conducted in the 1970s. Shortly following reintroduction, this herd declined to just seven individuals, but increased to approximately 40 to 45 individuals by 2003. Lamb recruitment was very low in the early 2000s; lamb mortality may have been due to the proliferation of *Pasteurella spp*., which was positively identified in two lamb carcasses (Delmolino 2005). *Pasteurella spp.* is a pneumonia-causing bacteria which can be spread between both domestic and wild sheep. The size of the bighorn herds north of Blue Mesa Reservoir have increased by approximately 35 individuals to approximately 125 individuals over the past five years (CPW unpublished data 2013). This qualitative population estimate, based on surveys, agency reports and hunter reports includes two herds in the CPW RBS-25 management unit: the 'West Elk' herd and the 'Dillon Pinnacles' herd. These two herds likely have some interaction, but only the 'Dillon Pinnacles' herd occasionally uses habitat within CURE.
Elk	Abundance		Elk herds south of the reservoir (CPW management unit E25) have been reduced over the past 10 years to a relatively stable and sustainable population of approximately 6,100 individuals (CPW unpublished data 2013). Elk herds north of the reservoir (CPW management unit E41) have decreased from approximately 5,700 to approximately 4,300 individuals over the last 5 years (CPW unpublished data 2013). It is CPW's goal to further reduce this herd to reduce private land conflicts in the Ohio Creek drainage and protect the winter habitat throughout this management unit.

Gunnison's Prairie Dog	• Number of Colonies • Area Occupied		The area occupied by Gunnison's prairie dogs has decreased from 194 acres to just 57 acres (61 percent decline) and the number of active colonies has decreased from 7 to just 3 (57 percent decline) since records were first kept in the 1970s (Childers 2013). Most colonies have experienced complete die-offs from plague outbreaks approximately every 10 years. Four of these colonies remain inactive. One colony with no known history of plague was likely extirpated by flooding. Gunnison's prairie dogs are considered a candidate species under the Endangered Species Act throughout the mountain portion of their range, which includes CURE (USFWS 2008).
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 the Gunnison Gorge. Periodic observations of both individuals 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; sightings of individual otters have been reported along Steuben Creek, the Neversink area, and adjacent to Blue Mesa Reservoir (Boyle 2006, CPW unpublished data). Sightings of otters are rare, but sign including tracks, prey remains, scat, and evidence that otters have traveled on snow, is frequently observed.

Resource Brief: Cooperative Conservation for a Sensitive Species

The U.S. Fish and Wildlife Service (USFWS) recently proposed to list the Gunnison Sage-grouse as endangered. Gunnison Sage-grouse have a very restricted range; seven small and geographically separated populations remain in Colorado and Utah. Only two NPS units are occupied by Gunnison Sage-grouse, CURE (Gunnison Basin population) and BLCA (Crawford population). The NPS collaborated with USFWS, Bureau of Land Management (BLM) and US Forest Service (USFS) to develop a Candidate Conservation Agreement for Gunnison Sage-grouse in the Gunnison Basin population. This agreement details specific actions we will take in the course of carrying out business at CURE to reduce threats, including habitat fragmentation and disturbance to sage-grouse. The NPS also participates in the Gunnison Basin Sage-grouse Strategic Committee, a collaborative conservation group with members from local, county, state and federal government offices, and local stockgrowers, landowners, developers, environmentalists and recreationists. The Strategic Committee has developed an action plan detailing specific goals and tactics to protect sage-grouse habitat across all jurisdictional lines in the Gunnison Basin. Some significant conservation actions this diverse group has been able to accomplish include identifying habitat management priority areas, implementing protections for sage-grouse habitat in county land use regulations, coordinating invasive plant control efforts and community outreach. The NPS is also collaborating with the US Geological Survey to complete an extensive research project, producing spatially explicit, hierarchical nesting, summer and winter habitat models and examining landscape and patch scale habitat influences on nest survival. These products provide a much needed scientific framework to guide land management decisions.

Dark Night Sky

web

The nighttime photic environment and the 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 and visitor enjoyment. Many wildlife species and ecological processes depend on natural darkness and a natural nighttime photic regime. CURE has important ecological resources and the park's lightscape is valued by campers, stargazers, and fishermen; 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 the Elk Creek area in 2008, ALR was 0.16 and falls within the Good Condition criteria. Modeled value of 0.2 ALR for the entire park supports these observations. 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})		Data from comparable sites at Great Sand Dunes suggest that background ambient sound levels at Curecanti would be less than 20 dB (A) (unpublished NSNS data). Primary noise sources at Curecanti include jet aircraft, road noise, and boat traffic. US 50 traffic generates approximately 34 dB (A) at 1500m, with a 50 percent increase forecast over the next 20 years (CO DOT traffic data). The difference between noise levels and background sound levels will be greater than 14 dB (A) within 1 mile of US 50. These levels will affect a large portion of the recreation area. Commercial jets generate approximately 35 dB (A), with jets heard about every 10 minutes during the day. The FAA projects that annual U.S. air travel will rise from 51 million takeoffs and landings in 2013 to 70 million by 2030. The difference between noise from jet traffic and background sound levels will be more than 15 dB (A). Power boats on Blue Mesa and other reservoirs also contribute noise.

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 40 fires in CURE from 1974–2012 (Wildland Fire Management Information System (WFMI), Bockus 2013). Thirty of the fires were human-caused including two prescribed fires totaling 20 acres in the Soap Creek area (WFMI, Bockus 2013). Three large human-caused fires burned 135, 1,182, and 198 acres in 1974, 1977, and 2003, respectively (WFMI, Bockus 2013). The remaining 10 fires were caused by lightning and ranged in size from 0.1 to 2 acres (WFMI, Bockus 2013).
Landscape Dynamics	Land Converted (Percent Natural and Converted Land Cover)		Over 96 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 88 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 (6,209 people, 3.8 people/km^2). These numbers represent a decline from 2000 (7,126 people, 4.4 people/km^2).
	Housing (percent area by housing density class)		In 2010, 94 percent of housing development within 5 miles of the park was characterized as rural (<6.2 units/km^2). The percentages of rural and exurban (6.2–145 housing units/km^2) development have essentially remained unchanged since 2000.

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		Eighteen percent of sites have some type of datable material. These sites have produced diagnostic materials or radiocarbon dates by either surface collection or excavation.
Inventory	Percent of park adequately surveyed		Only about five percent to10 percent of the park has been adequately surveyed. Most surveys that were completed before about 1985 have proven to be irregular and the level of documentation was not consistent with current standards.

Documentation	Percentage of known sites with adequate National Register documentation		According to the national ASMIS database 133 of 393 (34 percent) sites recorded at CURE are Listed, Determined Eligible or Recommended Eligible for the National Register of Historic Places. All 133 sites are treated as eligible until determined ineligible.
Condition	Percentage of archeological resources in good condition		Currently, 64 percent of the CURE sites listed in ASMIS are in good condition. The few sites that qualify as a Maintained Archeological Resource have not been entered into the Facility Management Software System (FMSS) data system.

Cultural Anthropology

web

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		Only one narrowly focused ethnographic study has been conducted within the park, and the ethnographic relationship to the park is poorly understood.
	Appropriate studies and consultations document ethnographic resources and uses with regards to the park		Only one study by Dave Ruppert in 2002 has been conducted in the park. A comprehensive approach to ethnographic research has not been undertaken.

Cultural Landscapes

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research exists to understand the relationship of the cultural landscapes to the historic contexts of the park		No cultural landscapes have been evaluated. The park needs to identify all potentially eligible cultural landscapes to determine what historic contexts are relevant.
	Adequate research exists to document and preserve the cultural landscape of the park		No cultural landscapes have been evaluated.
Inventory	The scope of cultural landscapes in the park is understood and a determination has been made whether or not		Prior to completion of Cultural Landscape Inventories (CLI), all potentially eligible cultural landscapes listed in the CLI database need to be considered as important resources, and managed as much as possible as eligible. CLIs (or evaluations to see if a CLI is needed) are needed

	they are a fundamental resource		for: D&RG Railroad, features of the railway, Iola townsite, Cooper Ranch, Gateview Camps, and West Elk Creek Cabins; Cooper Ranch has previously been determined to not retain sufficient landscape integrity to be eligible, the remains of the Ranch need to be reevaluated as a landscape/district. Structures at West Elk Creek Cabins and Railroad rolling stock areas have been determined ineligible, but potential for eligible landscape (i.e. National Register district) needs to be evaluated.
	Percent of landscapes eligible for the National Register with accurate, complete, and reliable CLI data		No cultural landscapes have been evaluated.
Documentation	Percent of landscapes with adequate National Register documentation		No cultural landscapes have been evaluated.

Historic Structures

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Percentage of historic structures evaluated using appropriate historical contexts		Of fourteen historic structures in the park, eight are listed in the National Register of Historic Places, and two are determined Not Eligible (71 percent). 100 percent (8 of 8) of historic structures on the List of Classified Structures are listed on the National Register of Historic Places.
Documentation	Percentage of historic structures with adequate National Register documentation		71 percent (10 of 14) of the historic structures have adequate National Register documentation.
	All historic structures have been recorded commensurate with their significance and mandated purposes		In 2009, the park compiled available documents for historic structures.
Condition	Percentage of historic structures in good condition		Currently, 36 percent (5 of 14 structures) of historic structures are in good condition. The structures rated as good are all related to the Denver and Rio Grande Western rail road resources.

Resource Brief: Restoration of Locomotive 278

For nearly 100 years, transportation through the Gunnison River valley was dominated by the Denver and Rio Grande Western Railroad. The town of Cimarron was built to assist the movement of people, freight, and livestock along the east-west route. Little

remains of the historic railroad town of Cimarron, but eight rail cars displayed near the Cimarron Visitor Center hint at the activity at this location before the removal of the rails in 1949.

In 2012, the locomotive and its associated tender, commonly called a 'coal car', were restored to near-mint condition. Two other rail cars, and a rail bridge where the cars are normally displayed, are scheduled for repair and restoration in the coming years.

Locomotive 278 mid-way through the restoration process

Locomotive 278 after restoration

History

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand significance of site		Historians in the area have been conducting historical research that is relevant to the park. The park compiles primary materials as they become available.
	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 National Register documentation or with Determinations of Eligibility		Of fourteen historic structures in the park, eight are listed in the National Register of Historic Places, and two are determined Not Eligible (71 percent). 100 percent (8 of 8) of historic structures on the List of Classified Structures are listed on the National Register of Historic Places.

Museum Collections

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	The scope of museum collections in the park is understood. All resources have been surveyed to determine their appropriateness for inclusion in the museum/archive collection.		The park's Scope of Collection statement is current and accurate.
	Percentage of objects accessioned and cataloged		55 percent of the known objects and archives 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 Black Canyon and Curecanti 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 park that, combined, holds an excellent gathering of specimens from mid-level elevations within Colorado.

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 scaled cliff walls when climbing was a newly developing sport in the 1960s and 1970s.

2.3. Visitor Experience

Visitor Numbers and Visitor Satisfaction

web ▸

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of Visitors	Number of visitors per year		Visitation remains steady and within the 5 year average of 963,854 https://irma.nps.gov/Stats/Reports/ReportList.
Visitor Satisfaction	Percent of visitors who were satisfied with their visit		FY 2012 Visitor Satisfaction Survey was at 96 percent, well within the 5 and 10 year average of 94.0 percent and 84.7 percent. In the 2010 Visitor Study 85 percent of visitor groups rated the overall quality of facilities, services, and recreational opportunities as "very good" or "good". (CURE Visitor Study 2010)

Resource Brief – Community Outreach

The Division of Interpretation, Education, and Technology participates in many annual community events in Gunnison and Crested Butte, including the Safety Expo, Riverfest, USA Pro Cycling race, Gunnison Sage Grouse Festival, Children's Fishing Derby, various career fairs, and providing training for Western State Colorado University's Outdoor Education/ Interpretation classes. Staff from the Education Branch, as well as from Curecanti'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, division chiefs are also advisory members to many community groups, including the West Elk Loop Scenic Byway Commission, the Gunnison Trails Commission, The Gunnison-Crested Butte Tourism Association, and Rotary International. Park staff works closely with the Gunnison Observatory, providing programming at the observatory and serving on the board in an advisory capacity.

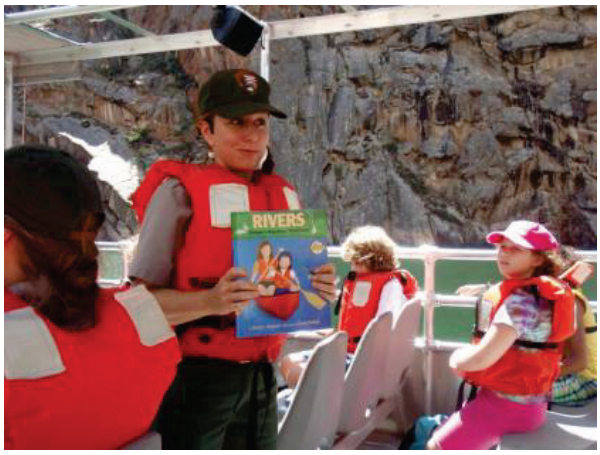
Interpretive, Education Programs, and Community Outreach

web ▸

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Education Programs	Number and level of teacher satisfaction with programs, and number of participants		The last three years the general trend has been stable in the number of programs offered. 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.

Ranger Programs	Number and level of visitor satisfaction with programs, and number of participants		Morrow Point boat tour continues to be very popular and nearly financially self-supporting. Ranger-led tours to view the night sky attract both local and visiting audiences. Informal ranger contacts are particularly effective in reaching recreationists and drive through visitors on CO92.
Junior Ranger Programs	Number of programs and attendance		Junior Ranger Program is well attended and popular. Major revisions to the book are completed. 134 children completed the program in 2012.
Community Outreach	Number of events attended and contacts		Community events fluctuate year by year. Park staff attends all events as pertinent to park mission. Fluctuating numbers reflect community scheduling. http://inside.nps.gov/sir/

Resource Brief - Education



Curecanti National Recreation Area has a long-standing and highly effective curriculum-based education program. Continuously offered since 1985, the curriculum-based program currently serves over 1,000 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 Environmental Education training for Western State Colorado University students are additional core program components. Communities served include Lake City, Gunnison, Marble, and Crested Butte. 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 agency in the Gunnison Basin providing curriculum-based programming, the National Park Service fills a leadership role in the community for family-focused, inter-agency events, such as the Gunnison Sage-grouse Festival, Gunnison Riverfest, and the Mill Creek Youth Summit.

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 anticipated beginning in FY14 to improve this condition.
Park Directional and Informational Signs	Usefulness, quality, and placement		In 2011 and 2012, new directional signs on Highway 50 alleviated previous consistency and physical condition issues. New entrance signs have been installed and new Aquatic Invasive Species informational signs have replaced the temporary signs that were in place for three years.

Exhibits	Elk Creek Visitor Center Condition and Accuracy		The majority of exhibits are considered temporary. In 2012 a new permanent 3-D Relief Model was installed. A funding proposal has been submitted to coordinate new exhibits with a remodel of the visitor center.
	Cimarron Condition and Accuracy		The exhibits are temporary, do not reflect current interpretive themes, and have been in place for approximately 20 years. Visitation is very low.
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. Printing is accomplished primarily through funding by Western National Parks Association.
Websites	Currency and scope of website		Information is current, comprehensive, and accurate but is difficult to navigate due to the constraints of CMS. The two webcams are very popular with a wide variety of users.
	Social media presence		Social media efforts have been recently initiated with a variety of video, photo, and text communications using 3 social media outlets. Followers are increasing monthly.

Resource Brief – Facilitating Connections

The purpose of Interpretation and Education in 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 Curecanti are:

- **Human History:** Curecanti holds stories from 10K years of human presence, showing a continuum of changing cultures, values, and technologies.
- **Water:** The three reservoirs of Curecanti NRA represent the conflicts, sacrifices, and benefits associated with water use in the west and other arid climates.
- **Geology:** Geologic forces shape the dynamic landscape of Curecanti and continue to reveal scenic vistas, unique rock exposures, and paleo environments.
- **Recreation:** Curecanti National Recreation Area offers a vast array of recreational opportunities attracting visitors seeking challenge, rejuvenation, togetherness, and/or solitude. These experiences can forge lifelong connections to place.
- **Natural History:** Curecanti NRA contains examples of ecosystems characteristic of native Colorado as well as a human-made reservoir system; these habitats provide outstanding opportunities to experience and appreciate a diversity of life.
- **Human Impact:** CURE is an example of the struggle inherent in balancing the needs of human populations while maintaining diverse natural habitats.

Recreational Opportunities

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Camping	Number of campsites and percentage filled		An adequate number of campsites with a popular reservation system are in place. However, visitor feedback indicates a need for improved and additional electrical hookups. A range of campsites are offered, including group sites.
Hiking	Range of opportunities		Options are available for varied terrain, scenery, length, and challenge levels. There are no wheel chair accessible trails.
Boating	Quality, quantity and diversity		Based on mussel inspection of motorized vessels at five launch ramps, the park averaged 14,000 motorized launches per year and approximately 1,500 hand launched vessels. The quality of the boating experience is enhanced by the size of the reservoir and its water quality. The boating experience goes from fjord like remote canyons to expansive open water.
Rural Western Landscapes	Condition and maintenance of views		The park is working through conservation easements and land acquisitions to protect the viewshed. Agency activities are consistent with maintaining rural western landscapes.
Fishing	Range of opportunities		A diversity of angling opportunities exist, including ice fishing, walk/wade fly fishing, and angling for trophy lake trout. Blue Mesa is also home to one of the largest Kokanee salmon fisheries in the United States.

Accessibility

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Mobility	Number of accessible facilities, trails, and overlooks		Campgrounds, picnic areas, and the Visitor Center have been retrofitted to be compliant with the Americans with Disabilities Act. Pioneer Point overlook was redesigned for mobile accessibility in 2012. An accessibility assessment is needed.
ADA accommodations	ADA compliance		Accessibility assessment needed. Lack specific, concrete guidance for interpretive media products.

Safety

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of law enforcement incidents	Recordable incidents		Law enforcement activity is relatively low given the visitation. Citations are issued primarily for misdemeanor and petty offenses. Arrests average 6 per year, usually for DUI, warrant, and disorderly conduct.
Number of accidents or injuries	Recordable incidents		A preponderance of accidents and injuries are boating related. Considering the level of use, the incident rate is low—accounting for mostly minor injuries and property damage.

Volunteers and Partnerships

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale Comments
Volunteers	Number and hours contributed		Volunteers support campground operations. In 2012, 27 volunteers contributed 5,678 hours.
Partnerships	Number of partnerships		Western National Park Association, Gunnison Valley Observatory, West Elk Scenic Byway group, local fire and law enforcement, Interagency fire agreements, BOR, City of Montrose, and Gunnison-Crested Butte Tourism Association.

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 337 locations at CURE for 2012 was 0.079, which is considered Good based on industry and NPS standards. The table below summarizes the number of assets at CURE 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	98 / 101	0.124 / 0.088		Building conditions have significantly improved due to cyclic and Repair/Rehab funded projects consisting of replacement of HVAC systems in maintenance shops, Elk Creek Visitor Center and administrative buildings; interior and exterior painting and rodent-proofing of facilities; code-compliant electrical system upgrades to maintenance shops and resource buildings; and carpet replacement. Under ARRA, CURE retrofits all lighting fixtures and bulbs with energy efficient replacements (approximately 4,500 units). Rehabilitated the Elk Creek campground kiosk into office space for the aquatic invasive species program. Repurposed open warehouse storage into secure space for each division, to properly safeguard government property. Constructed a two-bay boat repair facility. Installed meters for propane, electricity and water to separately meter buildings. Night sky initiative has replaced all interior and exterior lighting at Elk Creek campground. Maintenance shops, administrative buildings, concessions facilities (exterior of Pappy's Restaurant), and the marina area, to include the use of low energy CFLs and LED lighting. Housing (20 units): (EC5) Rehabilitation of six unit apartment complex with energy star appliances, low VOC paints, low E windows, roofing and recycled siding. Modified one unit to meet ADA accessibility guidelines. (EC 6 and EC 7) Rehabilitation of two twelve-room dormitory, including lights (incl. exit lighting), siding, energy star appliances, and paint. (EC 1) Rehabilitation of a second six unit apartment complex, including replacement of the furnace, and some appliances. (EC 3 and 4) Replacement of windows and doors, siding, appliances, painting, flooring, HVAC. Similar rehabilitation at LF 1 and 2, including roofing. Insulation was added during all renovations. Fire suppression systems installed at EC 3, EC 5, LF 1, and LF 2—bringing CURE to nearly full fire suppression coverage in housing units.
Campgrounds	16 / 16	0.155 / 0.089		Rehabilitated seven comfort stations at Elk Creek in loops A, B, C, and D—total rehabilitation for accessibility and energy efficiency and night sky lighting. At Lake Fork campground, rehabilitated comfort stations. At Steven's Creek, retrofitted upper campground with picnic tables, fire rings, pavement, and ADA accessible sidewalks, wind shelters. Picnic table replacement and camp fire ring at: Cimarron, Lake Fork, Elk Creek, Steven's Creek, Neversink, Cooper's, Cooper's

				West, and Beaver Creek.
Trails	10 / 11	0.108 / 0.057		Utilized Mesa Youth Services to correct campground and trail deficiencies for visitor and staff safety and enjoyment, including trail brushing, drainage structures, foot bridge repair and trail surface repair. NPS trail crew repaired foot bridges, drainage structure repair, rock staircase installation, rehabilitation of nature trails and overlooks (including guard rail and hand rail replacement). All trails have received annual cyclic repairs.
Waste Water Systems	10 / 10	0.153 / 0.093		Rehabilitated sewer system at Lake Fork Conducted comprehensive underground utility assessment of sewer piping, including video inspection.
Water Systems	10 / 10	0.150 / 0.032		Upgraded water system upgrades at Steven's Creek (pumphouse and campgrounds), Elk Creek (pumphouse and campground waterlines), and Cimarron (pumphouse). Repainted water storage tanks at Iola and Elk Creek. Installed new water well (#4) at Elk Creek. Upgraded photovoltaic systems providing electricity to water well pump(s) at East Elk Creek, Red Creek, Dry Gulch, and Gateview. Installed SCADA computerized monitoring of water and sewer system at Elk Creek, Lake Fork, and Iola. Retrofitted campgrounds and building with water reducing toilets, urinals, sinks and faucets.
Unpaved Roads	10 / 4	0.034 / 0.013		Roads are maintained in good condition, to include dust control, regrading, culvert drainage maintenance. Emergency evacuation and rehabilitation of Gateview road and campground, covered by an MOU with Bureau of Land Management.
Paved Roads, Parking Areas, Bridges, Tunnels	85 / 105	0.138 / 0.123		Replaced major highway signs along 35 mile Highway 50 corridor. All asphalt roads received pavement preservation treatment and restriping. All new barricades/gates and signage at all entrance roads. Federal highways comprehensive inspection completed at Beaver Creek tunnel. Cyclic replacement of regulatory and area signage. Boat Launch Areas (5): Replacement of Elk Creek breakwaters (600 feet). New floating restrooms at Elk Creek. Project approved to replace Steven's Creek and Iola breakwaters.
Interpretive Wayside Exhibits	111 (waysides)	0.112		Interpretive wayside exhibits. Resource/cultural historic train and historic trestle. See Interpretive Media section above for additional detail.
Concessions (All Others)	53 / 77	0.216 / 0.204		In 2012, Lease Surrender Interest (LSI) was procured for the concessions contract. NPS now owns and maintains critical systems for marina facilities. NPS received these facilities in Poor

				condition. Marina facilities: restaurant, floating stores/fueling stations at Lake Fork and Elk Creek, dock facilities; shower facilities; critical systems include water, sewer, electric, structures, fire suppression, fuel systems, floatation infrastructure. The assumption of LSI has resulted in high FCIs and increased workload to correct these major deficiencies. Replaced of Elk Creek marina west dock. Construction and installation of 100 feet of Lake Fork walkway/ramp.

Upgrading the Elk Creek #2 well and pumphouse

Installation of floating restroom at Elk Creek marina

Prepping building for paint

Building after painting

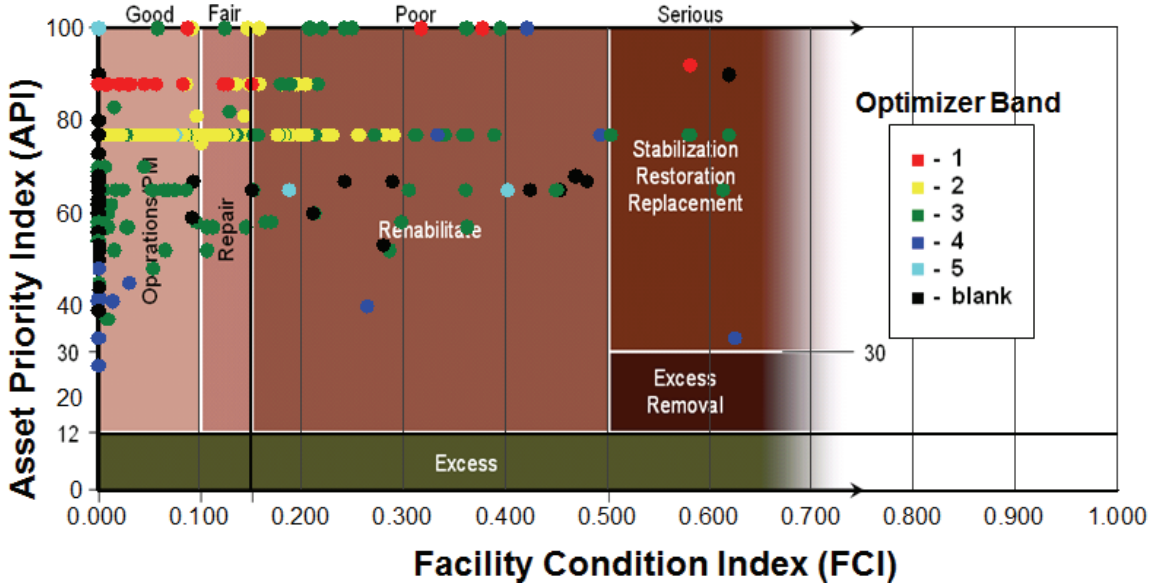
Park Infrastructure Brief - Recycling and Greening of the Park Program

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.

Recycling center, including cardboard compactor and comingled recycling container

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 Curecanti NRA. 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.



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.

Park Infrastructure Brief - Fleet Program

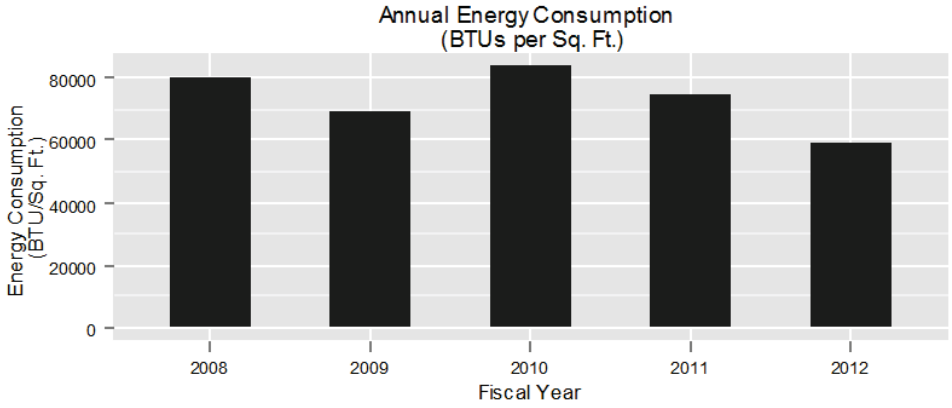
Curecanti replaced traditional vehicles with alternative power vehicles—electric, flex fuel—and obtained reuse vehicles. The park maintained the fleet using recycled and environmentally friendly products. CURE replaced boats with watercraft motors meeting EPA 2006 emissions standards. Park facility managers maintain the tour boat, including seasonal transfer of the boat from trailer to water, with help from the Bureau of Reclamation.

Energy Consumption

web

The production of energy to heat, cool, and illuminate buildings and to operate water utility systems is one of the largest contributors to greenhouse gas emissions in the United States. The National Park Service is committed to improving facility energy performance and increasing its reliance on renewable energy sources. The National Park Service has a goal to reduce Servicewide building energy consumption per square foot of building space by 35 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 23.3 percent lower than the average for the previous 4 years (Source: NPS Annual Energy Report).

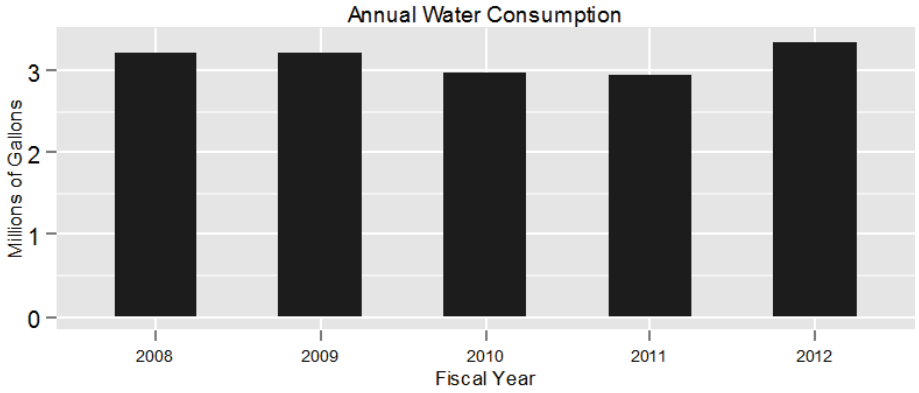


Water Consumption

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 was 3.333 Million gallons, which represented an 8.4 percent increase from the 4-year average for 2008–2011 (Source: NPS Annual Energy Report).



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 in the protection of water quality with local stakeholders.
- Obtained designation of Outstanding Waters for select park tributaries.
- Participate with Gunnison Climate Working Group to develop vulnerability assessments and adaptation strategies for the Gunnison Basin.
- Worked with the Northern Colorado Plateau Network to implement long-term monitoring of uplands, Gunnison River, invasive plants, landbirds, climate, air quality, landscape dynamics, and land surface phenology as well as streamlined data management and reporting for water quality.
- Completed 12-year habitat use and nest survival study for Gunnison Sage-grouse in cooperation with USGS to complete three publications on habitat modeling and nest survival.
- Cooperate in interagency effort with USFS, BLM, and USFWS, to complete the Gunnison Sage-grouse Candidate Conservation Agreement.
- Participate in interagency and private citizen conservation planning with the Gunnison Basin Gunnison Sage-grouse Strategic Committee.
- Repair and maintain historic ditch and water right for weed control and restoration of Elk Creek area.
- Monitor Gunnison's prairie dog colonies; prevent plague epizootic events through treatment of fleas.
- Installed bear-proof food storage lockers and completed bear management and response strategy.
- Monitor Peregrine Falcon territories and associated climbing closures in occupied territories.
- Cooperate with local entities to control invasive weeds.
- Developed fire management plan that provides for the use of fire to meet resource management objectives.
- Increased paleontological collections through survey and monitoring.
- Implemented mandatory watercraft inspection program to prevent the infestation of aquatic invasive species.

Cultural Resources

- Developed scope of collections.
- Conduct oral history interviews.
- Initiated major archival effort for up to 200,000 records.
- Evaluated prehistoric rock art site.
- Restored historic steam locomotive and tender.
- Listed eight railroad cars on the National Register of Historic Places.
- Maintain national databases such as ASMIS and LCS.

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; they are housed on the park website and You Tube.
- Currently working on Wayside Exhibit Plan.
- Upgraded and standardized all bulletin boards.
- Established presence on Facebook/Twitter/YouTube— thousands of followers.

Interpretative 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:
- Replaced entire CURE phone system.
- New satellite service at 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, used by many for weather and boating activities.

Visitor and Resource Protection:
- Increased LE presence on reservoirs coupled with complimentary vessel safety inspections had led to a decrease in boating related accidents.

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 Spill Prevention Comprehensive Countermeasure Plan.
- Implemented an Integrated Solid Waste Management plan.
- Procurement and installation of a hazmat storage facility through the regional Environmental Management Program.
- Instituted a comprehensive recycling program to reduce solid waste disposal by approximately 20 percent, which includes installation of recycling stations at visitor centers, marinas, picnic areas, campgrounds, overlooks, housing, and administration building.
- Installed SCADA system throughout greater recreation area to provide real-time monitoring and prevent sewage spills and report water leaks and usage.

Buildings & Utilities
- Diverse remodeling projects which provided needed improvements to park dorms and housing units.
- Installed Energy Star appliances and products in all housing units.
- Performed upgrades to nine water systems to meet State of Colorado drinking water regulations.
- Performed rodent proofing of park buildings to reduce risk of hantavirus.
- Replaced over 5,000 light bulbs with energy efficient bulbs, and replaced fixtures with more efficient models, resulting in a reduction of energy consumption of 25 percent.
- Installed night sky friendly outdoor light fixtures.
- Upgraded main power center for a cluster of administrative and maintenance buildings for improved electrical service and safety, along with energy efficiency.
- Safety improvements at Elk Creek propane farm.
- Upgraded the campground comfort stations, picnic tables, and fire rings.
- Replaced main water lines and well pumps and conducted pumphouse upgrades to meet State of Colorado drinking water regulations including a potable water system at Steven's Creek.
- Performed housing rehabilitation on all units in the park; installed multiple fire suppression systems in housing units.

- Performed rodent-proofing on park buildings, and installed new roofs.

Roads, Trails, Fleet & Marina

- Chip-sealed and restriped all paved roads and parking lots in park.
- Procurement and upgrade of boat fleet to meet EPA 2006 emissions standards for four-stroke engines.
- Marina facility improvements, consisting of breakwater replacement and floating restrooms, resulting in improvement in visitor experience.
- Continued improvement and stabilization of parkwide trail system.
- Performed pavement preservation on all asphalt roads within the park.
- Replaced area signage along 35-mile Highway 50 corridor.

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 CURE'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. CURE must manage 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 Gunnison Basin population;
- Potential for increased exposure and erosional impact to paleontological and archeological resources;
- Potential effect to reservoir water levels resulting in impacts to the fishery, reservoir foodweb dynamics, water quality, and flat water recreational boating;
- 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;
- Potential climate change effects to the resilience of natural systems to other stressors (non-natives, pests, etc.);
- Potential for increased wildland fire activity;
- Potential for effects to historic structures and cultural landscape elements.

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

- Continue parkwide inventory of cultural resources and the completion of baseline documents;
- Continued efforts to repair and restore historic railroad resources;
- 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:

- Prevent the infestation of park waters by aquatic invasive species;
- Finalize Congressional legislation to establish an authorized boundary for CURE;
- Protect adjacent lands in private ownership through cooperative conservation efforts with willing land owners;
- Cooperatively manage Gunnison Sage-grouse and their habitat across the Gunnison Basin landscape;
- Implement the motorized vehicle access regulations;
- Complete and implement the Wilderness and Backcountry Management Plan.

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 Cultural Resource-Related References

Collection of Visitor Experience-Related References

Glossary

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

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

Fundamental and Other Important Resources and Values	Fundamental resources and values are the particular systems, processes, experiences, scenery, sounds, and other features that are key to achieving the park's purposes and maintaining its significance. Other important resources and values are those attributes that are determined to be particularly important to park management and planning, although they are not central to the park's purpose and significance. These priority resources are identified in the Park Foundation Document and/or General Management Plan. The short-cut name that will be used for this will be Priority Resources.
Historic Integrity	Historic Integrity is the assemblage of physical values of a site, building, structure or object and is a key element in assessing historical value and significance. The assessment of integrity is required to determine the eligibility of a property for listing in the National Register.
Indicator of Condition	A selected subset of components or elements of a Priority Resource that are particularly "information rich" and that represent or "indicate" the overall condition of the Priority Resource. There may be one or several Indicators of Condition for a particular Priority Resource.
Interpretation	Interpretation is the explanation of the major features and significance of a park to visitors. Interpretation can include field trips, presentations, exhibits, and publications, as well as informal conversations with park visitors. A key feature of successful interpretation is allowing a person to form his or her own personal connection with the meaning and significance inherent in a resource.
Invasive Species	Invasive species are non-indigenous (or non-native) plants or animals that can spread widely and cause harm to an area, habitat or bioregion. Invasive species can dominate a region or habitat, out-compete native or beneficial species, and threaten biological diversity.
List of Classified Structures (LCS)	LCS is an inventory system that records and tracks the condition of the approximately 27,000 historic structures listed in the National Register of Historic Places that are the responsibility of NPS.
Museum Collection	NPS is the steward of the largest network of museums in the United States. NPS museum collections document American, tribal, and ethnic histories; park cultural and natural resources; park histories; and other aspects of human experience. Collections are managed by professionally-trained NPS staff, who 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.