

State Party's Report on the State of Conservation of its Property, Inscribed on the World Heritage List

Name of World Heritage Property: Yellowstone National Park, United States of America (N28)

Introduction

The World Heritage Committee listed Yellowstone National Park (YNP) as a World Heritage Site in Danger in December, 1995. In its decision, the Committee cited specific threats and dangers that were already affecting, were beginning to affect, or had potential to seriously compromise the outstanding universal values for which Yellowstone was inscribed as one of the first World Heritage sites. In its most recent decision (36COM7B.27, 2012) the Committee: 1) commended the State Party for progress made on key conservation issues, particularly relating to bison migration, suppression of the lake trout population, mitigation of human-grizzly bear conflict, improvement in winter visitor use, and mining and road impacts; 2) noted that YNP conservation programs will require sustained effort and considerable input of resources to ensure long-term success; 3) encouraged the State Party to establish co-operative relations between the park and private landowners and State land and wildlife regulatory agencies in lands surrounding the park, in the interest of achieving long-term preservation of bison, grizzly and wolf populations; and 4) requested the State Party continue to address key conservation issues, including funding and the establishment of co-operative relations between the park and other stakeholders. In keeping with the Committee's request, this document is the seventh progress report following YNP's removal from the Site in Danger list (in 2003) and includes updates on recent conservation issues and park programs that specifically seek to redress the 1995 threats and dangers.

Response from the State Party to the World Heritage Committee's Decision 36COM7B.27

"The WHC encourages the State Party to establish effective co-operative relations between the park and private landowners and State land and wildlife regulatory agencies in lands surrounding the park, in the interest of achieving long-term conservation goals for the park's bison, grizzly and wolf populations."

Bison

The Yellowstone National Park bison (*Bos bison* or *Bison bison*) population is the world's largest protected group of plains bison, and one of only a few populations to have continuously occupied portions of their current distribution. Within the park bison are managed as wildlife, not as livestock. They travel in multiple large herds across extensive portions of the landscape, both inside and outside park boundaries. Bison coexist with a full suite of native ungulates and predators, exposing them to competition for food and mates, predation, and survival under substantial environmental extremes. In addition, Yellowstone bison have high genetic diversity and are one of only a few bison populations with no evidence of interbreeding with cattle. As a result, Yellowstone bison have likely retained adaptive capabilities that may be diminished in other bison herds across North America that are managed like livestock.

Some Yellowstone bison are infected with brucellosis, a non-native disease that induces abortions, reduces bison birthing rates, and poses a risk of transmission to cattle. Livestock regulators' concerns over brucellosis have led to limited tolerance for bison in areas inside and adjacent to YNP and a lack of support for relocations outside of YNP for species restoration. When managing bison, YNP must also consider real or perceived conflicts including competition with cattle for grass,

property damage, fears for human safety, etc.; these conflicts also contribute to the limited tolerance for bison outside YNP. When bison leave the park, management jurisdiction passes to the surrounding states (Montana, Wyoming and Idaho). The State of Montana is evaluating how and where to provide additional tolerance for bison near YNP, and if wild bison should be managed elsewhere in the state. Currently, few bison migrate into Idaho or Wyoming.

Some Yellowstone bison need to be removed from the population on a regular basis to reduce the potential effects too many bison could have on ecosystem processes within their human-limited area of distribution. In 2000, state and federal managers created the Interagency Bison Management Plan (IBMP) with a guideline to maintain an end-of-winter population of approximately 3,000 bison. Under the Plan (2001-2014), the population has actually averaged about 4,000 bison and considerable new science and experience suggests the 3,000-population guideline should be reconsidered. Recently, YNP and the State of Montana have initiated a new planning process for bison management that could include alternatives with higher population levels. Yellowstone National Park and the State of Montana have initiated the preparation of a new Environmental Impact Statement over the next three to five years to consider changes in the management of Yellowstone bison and brucellosis given substantial new information, changed circumstances, and the passage of more than 13 years since the IBMP was implemented in 2001. **The park is also evaluating the feasibility of a bison quarantine program.** Under this program, bison under quarantine that test negative for brucellosis exposure could be considered for relocation in or outside YNP (e.g., tribal lands) for conservation, cultural, and commercial purposes.

The original IBMP envisioned a maximum of 100 bison being allowed to migrate both north and west of YNP to lower elevation winter ranges in Montana. However, adaptive management adjustments to the IBMP during 2005 to 2012 increased tolerance for bison on habitat in Montana by expanding the northern and western management areas and allowing more bison to occupy these areas during winter and spring. During March through May, 2009 to 2014, between 200 and 700 bison were allowed to migrate beyond the western boundary of the park and access suitable habitat north of West Yellowstone, Montana. During 2011 to 2014, more than 300 bison were allowed to migrate north of the park boundary onto habitat north of Gardiner, Montana. **Thus, these adjustments resulted in far more tolerance for bison than envisioned in the original IBMP.**

The National Park Service (NPS) has released details of annual bison management strategies, which were subject to a full discussion at public meetings regarding the IBMP. Meeting summaries, copies of annual plans and reports, and published articles are available online at <http://ibmp.info>. Additional information about Yellowstone bison and their management can be found at <http://www.nps.gov/yell/naturescience/bison.htm>.

Gray Wolves

Gray wolves (*Canis lupus*) are considered a keystone species in the Greater Yellowstone Ecosystem (GYE). Predator eradication programs eliminated wolf packs from YNP by the 1920's, and by 1978, all wolf subspecies were on the federal endangered species list for the lower 48 states except Minnesota. Restoration began in YNP in 1995, and the wolf population grew rapidly as the newly formed packs established numerous territories with sufficient prey, primarily elk. **Recent counts in YNP (2014) estimate 128 wolves living primarily in the park.** These totals are slightly higher than recent years when about 100 wolves were counted. Wolf numbers have decreased by about 50% since 2007, likely due to fewer elk in the ecosystem. Wolf numbers in central YNP decreased less than in northern YNP, likely due to supplemental predation on bison by those packs. The gray wolf

was removed from the endangered species list in Idaho and Montana in 2011 and in Wyoming in 2012. **However, in September 2014 a federal judge overturned the delisting of wolves in Wyoming and reinstated federal protection under the Endangered Species Act.**

Yellowstone National Park works closely with the Yellowstone Park Foundation to secure long-term funding for park wolf research. Additional funds are obtained through competitive grants (e.g., National Science Foundation). Each year, personnel in YNP, in coordination with university partners, conduct comprehensive research on the park's wolves. Work includes population dynamics monitoring, life history, dispersal, distribution, disease, genetics, predator-prey dynamics, and ecosystem impacts of wolves. Current field efforts documented a stable wolf population, not significantly affected by disease outbreak or wolf hunts outside the park boundaries. **Recently, at the park's request, the states of Montana and Wyoming reduced the quota of wolves in hunting districts adjacent to the park's northern and eastern boundaries. These changes increased the level of protection for wolves primarily living in YNP.**

Wolf management activities also included den site closures and wolf hazing events. Staff continue to manage wolf viewing areas in Slough Creek, the Lamar Valley, and other locations where wolves are frequently sighted. Park staff conducts significant public outreach related to wolves. In 2013, staff gave 265 formal talks, participated in 82 interviews, and made 18,822 visitor contacts.

For more information, please see <http://www.nps.gov/yell/naturescience/wolves.htm>.

Grizzly Bears

The grizzly bear (*Ursus arctos horribilis*) is an iconic species which has been prominently featured in historic literature and imagery of YNP. Predator eradication programs eliminated grizzly bears from most of the western United States by the 1950s. Due to its isolation, YNP became one of the last refuges for grizzly bears south of the Canadian border. Following the establishment of YNP, garbage became a significant food source for bears. To return bears to a diet of native foods, many garbage dumps in the GYE were closed or fenced in the 1960s and 1970s. Following the dump closures, human-caused mortality increased significantly and the population decreased from an estimated 234 grizzly bears prior to the dump closures to 136 bears in 1975. That same year the grizzly bear was federally listed as a threatened species. In 1973, it was determined conservation of the grizzly bear population in the GYE could be best accomplished by a unified, interagency group. The Interagency Grizzly Bear Study Team was formed; today, the group is comprised of four federal, three state, and two tribal agencies. The Team is directed to conduct research and monitoring of grizzly bears on behalf of the ecosystem. Research is focused on population and habitat monitoring, monitoring of food resources, and monitoring of grizzly bear-human conflicts in the ecosystem.

Intensive conservation efforts allowed bears to make a remarkable recovery. **As of November 2014, the grizzly bear population in the GYE was estimated at 674-839 bears.** There are more grizzly bears today, occupying a larger area in the GYE (53,151 km²), than there were in the late 1960s prior to the closure of the garbage dumps (234 bears occupying 7,813 mi²). Grizzly bears have reoccupied areas from which they have been absent for decades. In YNP, cub survival has significantly exceeded human-caused mortality in 25 of the last 26 years. Although park visitation now averages over 3 million visits annually, bear attacks on people and incidents of bears damaging property remain low. Bear attacks on people average one per year, while incidents of bears damaging property average five per year. The high visibility of bears foraging native foods in roadside meadows has made YNP one of the most popular bear viewing destinations in the world.

Whitebark pine (*Pinus albicaulis*) is an important, yet diminishing resource for grizzly bears in the GYE. However, bears with whitebark habitat within their home ranges continue to forage pine seeds when available. While the long-term future of whitebark pine remains uncertain due to climate change, grizzly bears are well suited to adapt to changes in the abundance of individual foods. Grizzly bears in the GYE currently consume more ungulate meat and eat more roots and false truffles during years with poor whitebark pine seed production. Ongoing research by the Interagency Grizzly Bear Study Team summarized in the report, *“Responses of Yellowstone Grizzlies to Changes in Food Resources: A Synthesis,”* indicates that the whitebark pine decrease has had no profound negative effects on grizzly bears at either the individual or population level. Yellowstone grizzly bears have shown notable resilience in the face of changing food resources. Grizzly bears have maintained body mass and percent body fat through diet shifts. The U.S. Fish and Wildlife Service is currently considering removing grizzly bears in the GYE from their federal status as a threatened species.

The National Park Service and its partner agencies, working through the Interagency Grizzly Bear Study Team and the Interagency Grizzly Bear Committee, continue public outreach efforts. One such program is the Wyoming Bear Wise Project (http://www.jhwildlife.org/index.php/bear_wise/jackson_hole/), which strives to educate the public on issues related to human-bear conflict and to empower landowners to prevent such conflicts. Private landowners and stakeholders surrounding YNP are engaged in grizzly bear management issues through twice per year meetings of both the Yellowstone Ecosystem Subcommittee and Interagency Grizzly Bear Committee. In addition, county commissioners from the states of Wyoming, Montana, and Idaho are members of the Yellowstone Ecosystem Subcommittee. Bear management efforts inside YNP continue through a combination of NPS funds and funds provided by the U.S. Fish and Wildlife Service, Yellowstone Park Foundation, and other organizations.

For more information, please see <http://www.nps.gov/yell/naturescience/gbear.htm>.

“The WHC requests that the State Party continue to address key conservation issues, including funding and the establishment of co-operative relations between the park and other stakeholders.”

One of Yellowstone National Park’s management goals is to minimize human interference with ecological processes in the park. To determine whether changes that take place in the park are a result of natural processes or of human influences (within or outside the park) requires systematic monitoring. This monitoring is conducted by YNP staff, other NPS staff, staff from other federal agencies, and university scientists. The park pays particular attention to key ecosystem processes or species. We also monitor use of the park by visitors, and employ mitigation strategies for human influence, such as our sustainability program and our various resource education programs. For more information, please see <http://www.nps.gov/yell/parkmgmt/upload/vitalsigns2-2.pdf>.

Climate

Climate is one of the primary drivers of the physical and ecological processes that determine the distribution, structure, and function of ecosystems. Moreover, there is strong evidence that climate has changed in the past century and will continue to change. The alpine zone, which begins at 9,500 feet, may migrate higher, with habitat for important species like whitebark pine substantially reduced. Changes in snowpack and timing of spring runoff may disrupt native fish spawning.

Changes in precipitation and temperature regimes could disrupt vegetation growth, which in turn would disrupt wildlife migrations.

Yellowstone National Park, in coordination with partners in the GYE, is developing a **Climate Change Response Strategy**. This strategy focuses on monitoring trends in temperature, precipitation, snowpack and runoff throughout the area and integrating that information into ongoing studies about wildlife and vegetation. Scientists are developing new small-scale water balance models that more accurately predict climate change effects at local levels. Yellowstone's managers are using these predictions to think about future climate scenarios and consider how climate change might affect park resources. The **Greater Yellowstone Area Climate Explorer** (<http://www.nps.gov/features/yell/climateexplorer/index.html>) allows users to compare historic averages to future predictions for climate variables in Yellowstone region. The **Greater Yellowstone Area Climate Analyzer** (http://www.climateanalyzer.org/greater_yellowstone/map.html) and **Yellowstone's Climate at a Glance** (http://www.climateanalyzer.org/y_dash) give park staff and the public access to current and historic climate data from all of the area weather stations and stream gages. The park's thermophilic plants may also provide clues to how other plants will respond to global climate change. Scientists are studying them to understand how they withstand high amounts of carbon dioxide and high soil temperatures. An entire *Yellowstone Science* issue devoted to climate change research in the GYE is planned for distribution in early 2015.

Fire

Wildland fire is monitored by YNP's Fire Management Program. Annual fire activity has fluctuated between less than one acre and nearly 29,000 acres since 1988. In 2014 there were five recorded wildland fires within the park. Three were started by lightning, and two were human caused for a total of approximately half an acre burned. This activity was well within the range for historic conditions. Three fires were suppressed and two fires quickly went out naturally. Park policy is to allow naturally ignited fires to burn, but suppress fires that are human caused or endanger people or property, taking weather conditions into consideration. Although the frequency and size of fires is affected by many factors, including wind conditions when a spark ignites, more acres are likely to burn during low-moisture summers.

For more information, please see <http://www.nps.gov/yell/naturescience/wildlandfire.htm>.

Geothermal Systems and Subsurface Geology

Yellowstone National Park contains over 10,000 thermal features (hot springs, steam vents, geysers, and mudpots) and is considered one of the largest geothermally active areas in the world. We are required by law to protect the park's unique, geothermal resources from the effects of geothermal development external to the park. The park tracks activities in known geothermal areas outside the park that, if developed, could have potential to alter the function of hydrothermal systems in YNP.

One method to monitor overall changes in the park's geothermal system is to measure the total amount of chloride leaving the park through its major rivers. Because chloride is thought to be sourced from deep geothermal reservoirs, variations in the total amount of chloride discharged may indicate changes in the geothermal system. Current data show no chloride values that are outside the normal range of variability. The park also uses aircraft to obtain thermal infrared images. These images are being used to document natural and anthropogenic changes in various geothermal areas within the park.

Although an eruption of the Yellowstone volcano is unlikely in the foreseeable future, monitoring of seismic activity, ground deformation, and changes in geothermal water chemistry provides information to the public and government agencies about a possible volcanic eruption. A partnership with the Yellowstone Volcano Observatory makes these monitoring efforts possible. Current earthquake activity and ground uplift patterns and rates are well within historical norms.

In 2013, YNP convened a meeting of leading experts from universities and federal agencies to review and summarize the geological and hydrological understanding of the Upper Geyser Basin area that includes the iconic Old Faithful Geyser. The **Old Faithful Science Review Panel** prioritized avenues for addressing key knowledge gaps that limit informed decision-making in this fragile, natural landscape. They also put forth guidelines to minimize future impacts to the hydrothermal system. The final report of the Old Faithful Science Review Panel is available at <http://pubs.usgs.gov/of/2014/1058/>.

For more information, please see <http://www.nps.gov/yell/naturescience/geologicactivity.htm>.

Water Quality

All water bodies within YNP are classified as Outstanding Natural Resource Waters (ONRWs). Designated due to their unique characteristics (e.g., waters of exceptional recreational, environmental, or ecological significance) all ONRWs must be maintained and protected according to U.S. Environmental Protection Agency (EPA) standards. Park staff and partners monitor water temperature, dissolved oxygen, pH, specific conductance, turbidity, total suspended solids, and a number of metals and nutrients at select streams and lakes throughout the park. Despite naturally high levels of arsenic associated with geothermal activity, nearly all monitored sites meet or exceed national and state water quality standards. The two exceptions that do exist are streams with impairments associated with either water right allocations that permit water removal or historic mining impacts—both activities occur outside the park boundary. Accordingly, portions of Reese Creek and Soda Butte Creek are present on the State of Montana’s list of impaired waters (i.e., 303(d) list) and park staff and partners are actively working to monitor conditions and characterize potential impacts in these streams.

On the park’s northern boundary, a segment of Reese Creek is described as only partially supporting cold water aquatic life. The cause of impairment to the creek (as identified by the State of Montana) is periodic dewatering associated with irrigation withdrawals just outside the park boundary. Because Reese Creek provides habitat for resident and migratory Yellowstone cutthroat trout, minimum stream flows were established (1.3 ft³/sec) for the period between mid-April and mid-October. Flow monitoring by park staff from 2008 to 2014 indicates that minimum stream flows vary seasonally and across years typically peaking in late May to mid-June. Over this period, stream flows below the minimum flow requirements were documented in only two years (2012 and 2013). In both years low flow periods were documented during late summer. In no years was a complete dewatering of the stream documented. The park continues to monitor flows in Reese Creek and is working closely with other federal agencies and the landowner to maintain summer stream flows and improve fish passage.

Mining activity that occurred outside of YNP’s northeast entrance and near Cooke City, Montana ceased in the 1950’s but some contamination associated with tailings present in the Soda Butte Creek floodplain remains. These tailings are believed to be the primary source of metals impairing a segment of Soda Butte Creek that extends downstream into YNP. Because of its impaired status,

park staff and partners periodically measure total and dissolved arsenic, copper, iron, and selenium in stream water. Metal concentrations for arsenic, selenium, and zinc were below EPA standards for drinking water and the State of Montana's aquatic life criteria. From 2010 to 2013, total iron concentrations exceeded the State of Montana's aquatic life criteria in approximately 20% of more than 75 samples collected between January and October over these four years. In 2014, an event-driven sampling campaign was employed to document iron levels during three rain/snow events. During all three events, State of Montana aquatic life criteria exceedances were documented for total iron. From these data, iron and copper concentrations appear to be highest during peak flows and immediately following precipitation events. Although elevated levels of iron and copper are still detected in the stream, these concentrations do not appear to have significant adverse effects on the benthic macroinvertebrate and fish communities. **Over the last three years, the State of Montana has worked to successfully remove tailings, arguably the largest source of metals to Soda Butte Creek, from the floodplain. As a result, park staff anticipates further reductions in the concentrations of heavy metals in stream water.** In cooperation with the Montana Department of Environmental Quality, the park continues to monitor background levels of metals and changes in metal concentrations following precipitation events within Soda Butte Creek.

For more information, please see

http://science.nature.nps.gov/im/units/gryn/monitor/water_resources.cfm.

Air Quality

As a federally designated "Class I airshed," Yellowstone National Park is required to meet high standards for air quality. In 2013, YNP was in compliance with federal standards for human health, ozone, particulate matter, carbon monoxide, nitrogen oxides, and sulfur dioxide. From 1999 through 2011, NPS Air Resources Division reported that air quality had neither deteriorated nor improved in the park. They are currently in the process of updating the Annual Performance and Progress Report for 2012-2013. At park locations where monitoring occurs, winter air-pollutant concentrations also remained below health standards set by the EPA.

Ozone is considered a moderate concern in the park. Visibility of viewsheds is monitored in the park and is considered a moderate concern. Sulfur dioxide, a major component of acid rain, is of moderate concern in the park. Nitrogen deposition, as a result of nitrogen oxides emissions, continues to be of significant concern because it is occurring at levels known to be harmful to sensitive areas including high-elevation alpine ecosystems, wetlands, lakes, and rangelands. Nitrogen depositions result from vehicle emissions, power plants, industry, agriculture, and fires. Total mercury wet (THg) deposition is also monitored in the park and has been relatively stable in the park. Concentrations of THg deposition measured in snowpack chemistry in the park are on the rise relative to the region.

Air quality is monitored at the West Entrance and at Old Faithful during the winter because of concern about the effects of over-snow vehicles (OSVs). **Since 2003, carbon monoxide and particulate matter concentrations have been greatly reduced, largely due to reduced snowmobile traffic and use of four-stroke engines in OSVs.** Although air quality in the park meets EPA standards for protection of human health, carbon monoxide and nitrous oxide levels sometimes exceed natural regional background levels in areas near congested vehicle routes.

For more information, please see <http://www.nps.gov/yell/naturescience/airquality.htm>.

Native Fishes

In 2010, Yellowstone National Park developed a **Native Fish Conservation Plan** to restore Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) and westslope cutthroat trout (*Oncorhynchus clarki lewisi*) to areas of their historic range. Management activities have primarily focused on the removal and control of non-native fishes in park lakes and streams, using application of piscicides, recreational fishing pressure, and gillnetting. At the onset of these efforts, the park developed a strong partnership with conservation and recreational angling organizations such as Trout Unlimited, the International Federation of Fly Fishers, the Greater Yellowstone Coalition, and the National Parks Conservation Association. YNP works closely with Wyoming Game & Fish, Montana Fish, Wildlife & Parks, the U.S. Fish and Wildlife Service, and the U.S. Geological Survey.

Efforts to restore Yellowstone cutthroat trout in Yellowstone Lake focused on the suppression of non-native lake trout (*Salvelinus namaycush*). Commercial fishermen and YNP staff removed 300,000 lake trout per year during 2012 and 2013, and 274,000 lake trout during 2014. **Lake trout predation pressure on cutthroat trout appears to have decreased, as there was a strong pulse of juvenile cutthroat trout in the system after these removals.** Additional restoration efforts for Yellowstone cutthroat trout occur in the northern region of YNP. A bedrock falls was modified in 2013 to prevent further invasion of upper Soda Butte Creek by rainbow trout. The design and engineering of barriers for Slough Creek and the upper Lamar River were also completed. Staff utilized raft electrofishing and targeted angling to remove non-native brook trout and rainbow trout from Slough and Soda Butte creeks, and the Lamar River. Finally, piscicide treatment of the Elk, Yanceys, and Lost Lake stream complexes occurred to address areas with high densities of invasive brook trout. These areas will be restocked with native Yellowstone cutthroat trout in coming years.

Westslope cutthroat trout recovery efforts focused on East Fork Specimen Creek, Grayling Creek, and the Goose Lake chain of lakes (Firehole River drainage). Eggs reared to eyed-stage were stocked in incubators along East Fork Specimen Creek. Following this effort, westslope cutthroat trout from these stocking efforts were observed spawning. In partnership with the Gallatin National Forest, a waterfall on lower Grayling Creek was modified to prevent the upstream movement of non-native fish into the park. Staff also treated Grayling Creek with piscicides to remove non-native fishes. Restocking of the Grayling Creek watershed with native fluvial Arctic grayling and westslope cutthroat trout is scheduled to begin in 2015.

For more information, please see <http://www.nps.gov/yell/naturescience/fish.htm>.

Wildlife Diseases

In national parks, where the goal is to minimize management intervention in ecological processes, disease outbreaks in wildlife may occur. Occasionally, intervention is considered necessary to reduce the impact of, or the risk posed by, a wildlife disease. However, none of the diseases mentioned here can be eliminated from non-captive animal populations by any currently available method. Significant diseases present in wildlife in YNP include brucellosis, parvovirus, distemper, mange, hepatitis, ranavirus, and chytrid fungus.

Many bison and elk in the GYE have been exposed to the bacterium that causes brucellosis, which originated in domestic livestock. It does not appear to have had substantial population-level impacts in wildlife, but infected females may abort their first calf, and the disease can be transmitted to livestock if they have contact with infected birth materials. Canine diseases, such as parvovirus, distemper, mange, and hepatitis are believed to have been a major factor in wolf population

declines in YNP in 1999, 2005, and 2008; these diseases also appear to have affected coyotes, foxes, and possibly cougars and other smaller carnivores. Amphibian diseases, such as ranavirus and chytrid fungus are of uncertain origin and often result in amphibian die-offs. Amphibian diseases are actively monitored by YNP and other NPS staff. Periodic monitoring for other diseases which have potential to appear but have not been documented in the ecosystem also occurs (chronic wasting disease, West Nile virus, and white-nose syndrome). Hantavirus, considered native in origin, has been found in some voles and deer mice, but transmission to humans in the park is not known to have occurred.

Visitor Use

Use by visitors is both a primary reason for the establishment of national parks and a factor in the condition of many of the natural and cultural resources that parks are intended to protect. While poaching and road collisions have immediate consequences for wildlife, most visitor impacts are less obvious. Ongoing visitor activities and associated infrastructure have the potential to affect many park resources, including air and water quality, natural soundscapes, night skies, wildlife, and archeological sites. After exceeding 3 million for the first time in 1992, annual visitation at YNP fluctuated between 2.8 and 3.3 million until new records were set in 2010 (3.6 million). Visitation remained high through 2012, and dropped in 2013 (3.1 million). About 70% of the visitation occurs from June through August. Winter visitation has never been more than 6% of the annual total. Similar to trends at other western parks, overnight backcountry use in YNP peaked in 1977 at more than 55,000 “people use nights” (the total number of nights spent in the backcountry). Since the mid-1990s, annual backcountry use has remained fairly steady, ranging between 37,000 and 46,000 person use nights.

While YNP has not set day-use limits for visitation, the park is in the process of increasing entrance fees and implementing an overnight backcountry use fee, which may result in increased recreational use costs to visitors. Beginning in 2016, YNP will be implementing day-use limits for commercial stock parties, limiting the total number of trips on specific trails. In addition, monitoring of resource impacts along roadways and in backcountry locations occurs on a consistent basis. Ongoing work includes audits of backcountry camping sites and trailheads, exotic vegetation control, wildlife monitoring near roadways, and instituting temporary speed reductions in sensitive areas. Yellowstone National Park has also implemented new programs to inspect all recreational watercraft for invasive aquatic species.

In an effort to reduce impacts of visitor-related road use on resources, the park carefully evaluates individual resources (e.g., geology, soils, geothermal resources, vegetation, wildlife, water resources, wetlands, historic structures, archeological resources, ethnographic resources) during road improvement projects. During the planning process, the park often implements necessary mitigation strategies to avoid impacts to resources, such as road realignment, road speed-limit reduction, and/or designing curves in roadways to reduce traveler speeds. In the recent Norris to Golden Gate Road Reconstruction Project, YNP determined road realignments were necessary to avoid continued or potential impacts to two thermally-influenced areas.

In terms of animal-vehicle collisions, in the last five years the park has seen a decrease in the number of road-killed wildlife. Analyses of wildlife data indicate that no population-level impacts are associated with road-kill mortality.

For more information on visitor use statistics, please see <https://irma.nps.gov/Stats>.

Winter Visitor Recreation

The popularity of visiting the park in winter, coupled with concerns over impacts to resources, has made the management of winter recreation a challenging issue for park managers. Yellowstone National Park has been challenged to carefully evaluate what type of transportation has the least impact on park resources, while providing for meaningful visitor experiences. For years, YNP managed the park in winter with interim management plans in the face of repeated courtroom challenges over snowmobiles and other winter operations. **The final management decision in October 2013 established a long-term management framework for winter use in Yellowstone National Park** and concluded more than 17 years of planning efforts and litigation. The new policy utilizes innovative approaches to **promote cleaner and quieter oversnow transportation in the park** by managing transportation events rather than capping a specific number of vehicles, provides greater flexibility for oversnow vehicle commercial tour operators, rewards new oversnow technologies that reduce noise and air pollution, and allows for increases in public visitation. In addition, the park authorizes an adaptive management approach to winter use management, which enables park managers to acknowledge uncertainties in the management of winter recreation and respond to changing conditions. Adaptive management emphasizes joint learning and active partnership between managers, scientists, and other stakeholders, including the public. Another component of this management decision allows for non-commercially guided snowmobile access to the park, which was also developed with significant input from stakeholders.

For more information, please see <http://www.nps.gov/yell/planyourvisit/winteruse.htm>.

Sustainability Initiatives

Yellowstone National Park, a certified “Climate Friendly Park” (see link below), continues to demonstrate a strong commitment to environmental stewardship by adapting facilities and programs to improve the sustainability of operations. While YNP continues to utilize long-standing sustainability initiatives, such as our waste stream diversion program, new initiatives are implemented annually. **In 2012, YNP completed a Strategic Plan for Sustainability**-since that time, the park has convened two workshops with partners to identify opportunities to meet the Plan goals. Recent sustainability achievements include the completion of a micro-hydropower energy plant in the Mammoth area of YNP, which the park hopes will reduce greenhouse gas emissions up to 15% by 2016. The park is also expanding the renewable energy electric grid at the Lamar Buffalo Ranch, and has installed five power saving units in emergency service vehicles (funding from the Department of Energy’s Clean Cities program). Additional projects were completed in partnership with the Yellowstone Park Foundation, who assists with corporate partnership development and marketing. One such YPF project was the completion of the renovation and LEED certification of the park’s historic Old Faithful Photoshop. The park also continues to work closely with universities for assistance and expertise in fleet, energy and water audits. Finally, YNP is in its 15th year of supporting a ride share program for Park employees who reside up to 55 miles north of the park. A park bus transports approximately 45 employees daily, reducing fuel consumption and air pollution, improving commuter safety, and reducing parking space pressure.

For more information, please visit <http://www.nps.gov/yell/parkmgmt/sustainability-contents.htm> or <http://www.nps.gov/climatefriendlyparks/>.

Public Outreach and Partnerships

In an effort to improve on the monitoring and management of park resources, Yellowstone National Park continues to seek new avenues to educate and engage the public and park stakeholders, and

identify funding sources to meet conservation goals. In 2015, the park will also focus efforts on the development of a long-term science strategy that will identify and prioritize research and monitoring goals for the park's top conservation challenges.

Over the past two years, YNP has engaged the public on conservation projects through public announcements, and has requested input on conservation and construction projects no fewer than 30 times and held no fewer than 7 public meetings and 4 tribal consultations. In addition to stakeholder outreach, YNP works to collaborate with other research entities and land management agencies on conservation issues. The park is a member of several interagency initiatives, including the Absaroka Wildlife Working Group, the Northern Range Wildlife Working Group, the Interagency Grizzly Bear Study Committee and the Interagency Grizzly Bear Committee, the Gardiner Gateway Project, and Friends of the Beartooth All-American Road.

Additionally, YNP works cooperatively with the Great Northern Landscape Conservation Cooperative (GNLCC) and the Greater Yellowstone Coordinating Committee (GYCC) on regional conservation issues. The GNLCC is comprised of 21 partners, both U.S. and Canadian, from across the Rocky Mountains and Pacific West. The GNLCC works to align and enact a unified regional response to landscape conservation initiatives, especially those related to climate change and stressors for the sustainability of natural and cultural resources. They facilitate data sharing and networking to meet data project goals, and promote cooperation across boundaries and jurisdictions. Like the GNLCC, the GYCC supports interagency cooperation in the greater Yellowstone region. Made up by four federal agencies (National Park Service, U.S. Forest Service, U.S. Fish and Wildlife Service, and the Bureau of Land Management), the group strives to identify emerging issues across the GYE where they can apply coordinated effort or approaches. The GYCC members find intersection in the missions of their agencies, by identifying opportunities of cooperative management or study of local resources.

Aside from having one of the NPS's largest resource education and outreach programs, YNP has a well-developed presence on social media. The park's Twitter feed has more than 50,000 followers subscribing to our daily posts (<https://twitter.com/YellowstoneNPS>). In 2010, the park created a Facebook page to strengthen public connections to park resources and to encourage visitors to share experiences of the park with each other. The Yellowstone National Park Facebook page (<https://www.facebook.com/YellowstoneNPS>) has been a successful outreach tool, with more than 500,000 followers, more than any other National Park Service unit. The park is also working on the expansion of resource information and content on the park's website, www.nps.gov/yell, and frequently uses Flickr and YouTube to promote park resources in photos and videos.

Other recent outreach and partnership efforts included hosting a scientific conference and establishing a new collaboration with the National Geographic Society. The 2014 Biennial Conference on the Greater Yellowstone Ecosystem, the twelfth in a series, focused on cross-boundary preservation of natural and cultural resources. The conference was an overwhelming success, uniting university researchers, various state and federal agencies, and interested community members. The 2014 development of a partnership with the National Geographic Society (NGS) will help the park to promote conservation by reaching NGS members and *National Geographic Magazine* readers. The NGS encourages stewardship through research, exploration, and education. To that end, NGS is producing an issue of *National Geographic Magazine* dedicated to the greater Yellowstone area that will educate the public about the unique conservation goals of

YNP. The historic collaboration between NGS and the National Park Service will serve as a highlight to the NPS Centennial celebration in 2016.

Funding

In fiscal year 2014, Yellowstone National Park obligated \$69.7M, of which \$33.8M was the park's base operating funds provided by Congress. This compares with fiscal year 2013 total obligations of \$66.0M, of which \$32.1M was park base. The total year-over-year increase of \$3.7M was the result of +\$1.7M increase to park base, +\$1.3M in project funding, +\$2.5M in construction spending offset by -\$1.7M reduction in fire costs. Park revenues increased year-over-year by \$1.8M, driven primarily by higher concessions franchise fees (+\$1.4M) and higher donations (+\$237K). A portion of these funds was spent on YNP's largest conservation issues, as outlined in this report.

“In conformity with paragraph 172 of the Operational Guidelines, please describe any potential major restorations, alterations and/or new construction(s) within the protected area (core zone and buffer zone and/or corridors) that might be envisaged.”

While there have been various construction projects within the park during the reporting period, none have had impacts that created or represented any threat, damage, or loss of Outstanding Universal Value, integrity, or authenticity, to the property as inscribed as a World Heritage site. Additionally, there have been no new major restorations or constructions meeting these criteria and occurring within the park since the last report in 2012. Furthermore, based on current knowledge, there is no single action in scoping within the GYE that would have an effect on the park as described within Chapter IV of the 2011 Operational Guidelines.

Relevant Literature

Interagency Grizzly Bear Study Team. 2013. Response of Yellowstone grizzly bears to changes in food resources: a synthesis. Report to the Interagency Grizzly Bear Committee and Yellowstone Ecosystem Subcommittee. Interagency Grizzly Bear Study Team, U.S. Geological Survey, Northern Rocky Mountain Science Center, Bozeman, Montana.

Koel, T.M., J.L. Arnold, P.E. Bigelow, P.D. Doepke, B.D. Ertel, and M.E. Ruhl. 2012. Yellowstone Fisheries & Aquatic Sciences: Annual Report, 2011. National Park Service, Yellowstone Center for Resources, Yellowstone National Park, Wyoming, YCR-2012-03.

Old Faithful Science Review Panel. 2014. Hydrogeology of the Old Faithful area, Yellowstone National Park, Wyoming, and its relevance to natural resources and infrastructure. U.S. Geological Survey Open-File Report 2014-1058.

Smith, D., D. Stahler, E. Stahler, M. Metz, K. Quimby, R. McIntyre, C. Ruhl, M. McDevitt. 2014. Yellowstone National Park Wolf Project Annual Report 2013. National Park Service, Yellowstone Center for Resources, Yellowstone National Park, Wyoming, YCR-2014-2.

The United States Department of the Interior. 2013. Budget Justifications and Performance Information Fiscal Year 2013. The United States Department of the Interior.

http://www.nps.gov/aboutus/upload/FY13_NPS_Greenbook.pdf

van Manen, F.T., M.A. Haroldson, K. West, and S.C. Soileau, editors. 2013. Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team, 2013. U.S. Geological Survey, Bozeman, Montana.

Yellowstone Center for Resources. 2013. Yellowstone National Park: Natural and Cultural Resources Vital Signs. National Park Service, Mammoth Hot Springs, Wyoming, YCR-2013-03.

Yellowstone National Park. 2012. The Greenstone: Sustainability Report 2012 Yellowstone National Park. National Park Service, Mammoth Hot Springs, Wyoming.

Yellowstone National Park. 2014. Yellowstone Resources and Issues Handbook: 2014. Yellowstone National Park, Wyoming.

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