



**NATIONAL
CONSERVATION
LANDS**

Gold Butte

National Monument

Nevada

Annual Manager's Report – Fiscal Year 2020

U.S. Department of the Interior
Bureau of Land Management

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U.S. Department of the Interior
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Gold Butte

National Monument

Designating Authority

Designating Authority: Presidential Proclamation -- Establishment of the Gold Butte National Monument 9559

Date of Designation: December 28, 2016

Additional Designations

There are two wilderness areas, a wilderness study area, and an instant study area; a National Back Country Byway; Desert Tortoise Critical Habitat; and six Areas of Critical Environmental Concerns (ACEC) within Gold Butte National Monument (GBNM).

Site Description

GBNM is located 80 miles northeast of Las Vegas and 20 miles south of the City of Mesquite. The monument encompasses nearly 300,000 acres of remote and rugged desert landscape in southeastern Nevada where dramatic red sandstone, twisting canyons, and tree-clad mountains punctuate desolate stretches of the Mojave Desert. The sandstone provides a canvas for the monument's famous rock art. The area is popular for outdoor recreation and visitors to the monument can hike to rock art sites, drive the Back Country Byway to the area's namesake mining ghost town, hunt Desert bighorn sheep, or tour the area's peaks and canyons on horseback.

Monument Offerings

GBNM has over 300 miles of designated routes, including a 64-mile Back Country Byway, which provides the public access to a variety of features. Some of those features include:

Whitney Pocket

A popular camping destination with Aztec sandstone formations, rock stories carved into stones by indigenous peoples, and structures built in the 1930s by the Civilian Conservation Corp.

Gold Butte Townsite

Building foundations and mining equipment for crushing ore are all that are left of the mining boom of the early 1900s at the Gold Butte Townsite.

Devil's Throat

An unusual geologic feature, Devil's Throat is a large, 100-foot-deep sinkhole.

Lime Canyon Wilderness and Jumbo Springs Wilderness

These two remote wildernesses offer opportunities for uninterrupted solitude and

spectacular views of the valleys and rivers below.

Year Accomplishments

- Junior Ranger Book developed with an anticipated release date in early 2021.
- Interpretive kiosks for Devil’s Throat sinkhole and Gold Butte Townsite installed.
- Whitney Pocket kiosk map was updated and installed.
- Volunteer cleanups at three sites were completed.
- Signs improved with assistance from Friends of Gold Butte (FOGB).
- Back Country Byway maintenance was done in collaboration with Clark County.
- Graffiti removal was completed from multiple sites.
- A volunteer monitoring program was implemented with the support of FOGB.
- High-use campsites had barriers installed to minimize impacts to resources.
- A United States Geological Survey stream guage was installed.

Future Priorities and Opportunities

The Bureau of Land Management (BLM) will focus on the following priorities for Fiscal Year (FY) 2021:

- Integrated Activity Planning and Land Tenure Updates.
- Community Engagement and Volunteer Program Development.
- Restoration and Invasive Species Eradication.
- Cultural Site Protection.
- Recreational Facility Improvements and Designated Route Naming.
- Hydrologic Groundwater Flow and Discharge Investigations.

Gold Butte

National Monument

Southern Nevada District Office

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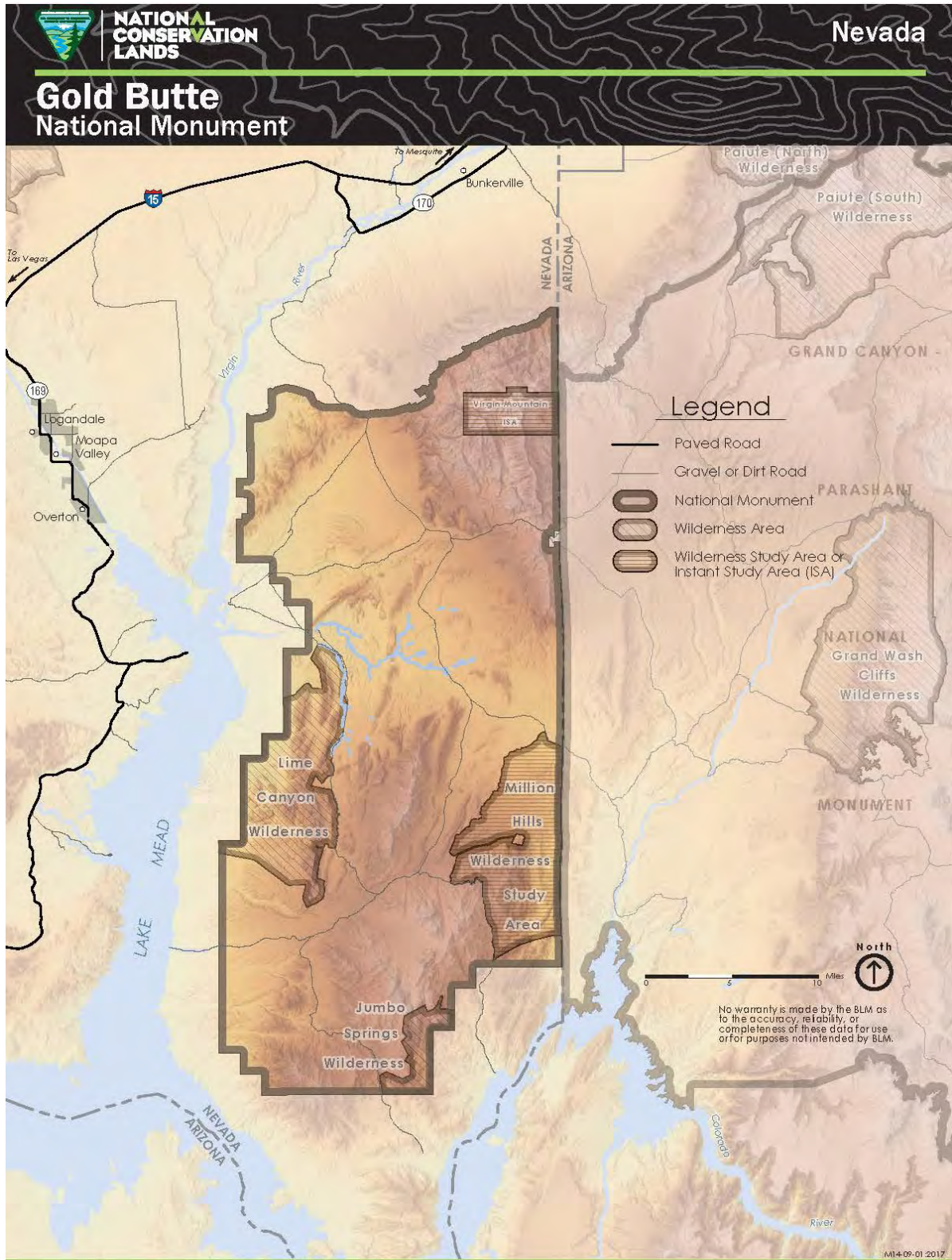
Las Vegas, NV 89130

Phone: 702-515-5000

Unit Manager: Lee Kirk

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Map of Gold Butte



1 Gold Butte Overview

Acreage

Total Acres in Unit	296,937
BLM Acres	285,158
Other Federal Acres	11,779
State Acres*	0
Private Acres*	0

*State and Private Acres are not part of the total unit acres

Budget

Budget Title	Code	Funding
Monuments & Conservation Areas	1711	\$112,797
Other (Southern Nevada Public Land Management Act BL 85 and BL 88)	5861	\$167,861
Gold Butte springs groundwater study	1711	147,800
USGS stream gauge installation at select springs	1160	71,000
Total Budget		\$499,458

Current Areas of Focus

Recreational use continues to increase within GBNM and impact cultural resources. The BLM finalized an environmental assessment (EA) in 2020 and will finalize a Historic Properties Treatment Plan (HPTP) in fiscal year (FY) 2021. This plan will provide for interpretation and recreation amenities at the Falling Man, Kirk's Grotto, and Whitney Pocket cultural sites. The recreational amenities could include interpretive kiosks, bathrooms and trails.

Planning and NEPA

Resource Management Plan

The Southern Nevada Public Land Management Act (SNPLMA) Project BL17-88 will enable GBNM to develop an Integrated Activity Plan, complete a cadastral boundary survey and land tenure adjustment, enhance the existing volunteer program and develop new visitor education materials that was initiated in FY 2020.

The integrated activity plan will consolidate information and analysis that has been collected over the years by the BLM and will include measures for the protection of the objects and values of the monument. The Integrated Activity Plan will adhere to already established planning doctrine from the Las Vegas and Pahrump Field Offices Resource Management Plan which includes the Gold Butte National Monument resource area.

The plan will respond to these preliminary questions:

- **Cultural and Historic Resources:** How should the cultural or historic resources and traditional cultural sites of the monument be protected, preserved, or restored, while still allowing for appropriate public visitation, outreach, and educational efforts? What level of management should the BLM apply to restore and enhance post-contact historical resources?
- **Tribal Resources:** What management measures are needed to ensure continuation of tribal activities and traditional use of sacred sites?
- **Wildlife and Special Status Species:** What management is needed to restore, maintain, or enhance priority species and their habitats, including critical habitat for listed species such as the Desert tortoise?
- **Vegetation Resources:** What goals, objectives, and management actions are necessary to maintain and improve vegetation, biological crusts, and native plant communities? Which treatments should be considered to reduce the spread of exotic or invasive species?
- **Recreation:** How will areas of high visitation be managed to protect sensitive resources? How should future Special Recreation Permits be managed? Are any facilities, such as campgrounds or trails needed for current recreation use, or should the issues be deferred to a detailed implementation-level recreation plan?
- **Lands and Realty:** What management actions are necessary to ensure water delivery facilities from valid existing water rights can be renewed, operated, and maintained, replaced, modified, or upgraded while protecting resources?
- **Wilderness and Wilderness Study Areas:** What management actions require implementation for the maintenance of wilderness areas and to insure adherence to non-impairment of these resources.

Travel Management Plan

A Travel Management Plan (TMP) was completed in 2008 to designate routes for ACECs located in the northeast portion of the Southern Nevada District Office (SNDO). The TMP designated 812 miles of routes as open to motorized use, with 300 miles of those routes located in GBNM.

National Environmental Policy Act (NEPA)

The Draft Environmental Assessment (EA) DOI-BLM-NV-S010-2019-0096-EA was completed. The EA disclosed and analyzed the environmental effects of the GBNM HPTP (Proposed Action), which consists of the installation and maintenance of interpretive and recreational facilities at three cultural complexes within GBNM: Falling Man, Kirk's Grotto, and Whitney Pocket cultural sites. The recreational amenities could include interpretive kiosks, bathrooms, and trails. The EA will be completed once the HPTP is finalized and signed.

Staffing

The monument continues to be managed by an Acting Monument Manager as the monument's staffing needs are addressed. Below is the organizational structure submitted to the State Director for review and approval:

-
- Monument Manager (GS-12) (Approved)
 - Natural Resource Specialist (GS-11) (Approved)
 - Outdoor Recreation Planner (GS-11) – Shared position (Approved)

These positions have been approved but remain vacant at this time. We anticipate these positions being filled in FY21. Additionally, the Law Enforcement Ranger position that serves the monument is actively being recruited after 5 years of vacancy.

The Southern Nevada District Office (SNDO) staff (e.g. wildlife biologist, wilderness specialist, botanist, maintenance, and law enforcement) provide key support to the operation and management of GBNM in the form of management recommendations for protecting or enhancing the natural resources of GBNM, providing public safety and resource protection, and addressing maintenance concerns.

2 Programs and Accomplishments

General Accomplishments

In 2020 the BLM continued to leverage the interest and abilities of tribes, federal agencies, local agencies, universities, friends' groups, and volunteers in the successful management of GBNM. In doing so, the BLM was able to make progress in meeting numerous program's needs. For example, route and intersection signs were installed helping to improve recreation activities and public safety. Also, a new radio repeater was installed in order to facilitate law enforcement and fire communications coverage throughout the entire monument.

2020 resulted in tremendous slowdown in planned work due to the impacts of the COVID-19 pandemic. While this slowed planning processes for administrative programs, focus switched to field activities enabling the BLM to address recreational needs and resource assessments throughout the monument.

The BLM continued establishment of the SNPLMA funded Gold Butte HPTP including completing the draft document, drafting of a Memorandum of Agreement with the State Historical Preservation Office, and recruiting a Tribal Liaison to aid and guide in the protection of the resources.

The BLM also began a study of the Gold Butte Back Country Byway, submitting a road improvement project for inclusion in the Great American Outdoors Act. The byway will require major improvements in the upcoming years to accommodate the growth of visitation since being named a monument.

General Accomplishments Table

Activity	Number of Visitors	Education Participants	Interpretative Participants	Contact Station Visits	Hours of Volunteers	Inventory water resources*
TOTALS	22782.5	N/A	N/A	N/A	2000	139

*number of parameter measurements

Education, Outreach, and Interpretation

The BLM continues efforts to engage the community through outreach by attending local town board and city council meetings. These activities ceased during the second part of the year due to the COVID-19 pandemic. These public forums have not yet been restarted, either in a virtual or in-person format.

Fish and Wildlife

Fish and wildlife monitoring and inventory activities were minimized during the year. Coordination with the Nevada Department of Wildlife (NDOW) continued in order to monitor and manage Desert Tortoise protection measures throughout GBNM.

NDOW continues to document environmental conditions (temperature, humidity, etc.) in some mines for on-going White-nose Syndrome surveillance. White-nose Syndrome is a fungal infection which can be fatal to bats and has decimated bat populations across the United States.

GBNM is home to multiple bat species. In 2019, thirty (30) sites scattered across GBNM were surveyed over a four-day period identifying 530 total bats representing 12 different bat species. The species captured are all special status species and include California Leaf-nosed bat (*Macrotus californicus*), California Myotis (*Myotis californicus*), Canyon bat (*Parastrellus hesperus*), Pallid Bat (*Antrozous pallidus*), and Yuma Myotis (*Myotis yumanensis*). Survey efforts in 2020 were limited due to COVID-19.

NDOW, in cooperation with BLM, conducts regional surveys to assess population trends of different species, and several surveys occur in GBNM. NDOW has a winter raptor survey route through GBNM. The route usually records a low number of raptors, but the following species were observed: Red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), Cooper's hawk (*Accipiter cooperii*), and Northern Harriers (*Circus hudsonius*). NDOW also has volunteers assist with road surveys in GBNM to record herpetofauna in the monument. The following species have been sighted during surveys: Sidewinders (*Crotalus cerastes*), Mojave rattlesnakes (*Crotalus scutulatus*), long-nosed snakes (*Rhinocheilus lecontei*), gopher snakes (*Pituophis catenifer*), and patch-nosed snakes (*Salvadora hexalepis*) as well as banded geckos (*Coleonyx variegatus*).

Desert Tortoise

Within GBNM is land designated critical habitat for Desert Tortoise, a federally listed threatened species. Designated by U.S. Fish and Wildlife Service in 1994, approximately 46% of GBNM is considered critical habitat for Desert Tortoise. The designation was made because this area of GBNM contains features essential to the conservation of Desert Tortoises. This habitat is characterized as sparse Creosote bush scrub on gentle slopes which allows for herbaceous plant growth. Efforts to protect and improve this habitat include habitat restoration, weed/invasive management, fire/fuels management, as well as promoting proper grazing allotment and horse and burro management, all of which are discussed below.

Grazing

There are two active grazing allotments on the GBNM. Lime Spring Allotment is entirely within the GBNM and consists of approximately 3,596 acres of public land. It is administered by the Arizona Strip Field Office (ASFO) through agreement with Nevada BLM. The agreement for allotment management by ASFO pre-dates the creation of the GBNM. The Lime Spring Allotment is designated as available for livestock grazing as an ephemeral allotment in the ASFO Resource Management Plan (2008). The allotment has a term grazing permit for ephemeral use, as such, grazing is authorized on a year-by-year basis dependent on available forage. This allotment was authorized for use in FY 2020. It is expected that grazing use would continue in the reasonably foreseeable future.

The Mesquite Community Allotment is also administered by the ASFO. Approximately 6,515 acres, or 13 percent, of the Mesquite Community Allotment is within the GBNM. The rest of the allotment is divided between the Grand Canyon-Parashant National Monument and the ASFO in Arizona. The allotment is designated as available for grazing in the ASFO Resource Management Plan (2008). There is an active term grazing permit for the allotment. The allotment was grazed in FY 2020. It is expected that grazing use would continue in the reasonably foreseeable future.

No grazing permit renewals were completed in either allotment in FY 2020. The Mesquite Community Allotment was monitored in FY 2020 but there are no monitoring locations within the GBNM. The Lime Spring Allotment was not monitored in FY 2020.

There were no new range improvement projects completed on either allotment within the GBNM in FY 2020. Regular maintenance of existing improvements was completed through cooperative agreement with grazing permittees.

There has been no change to authorized Animal Unit Months (AUMs) since the creation of the GBNM.

Partnerships

Friends of Gold Butte (FOGB)

The mission of FOGB is “to promote the responsible enjoyment of the Gold Butte National Monument through education, stewardship, advocacy, and preservation of natural and cultural resources.”

The BLM has entered a Memorandum of Understanding (MOU) with the FOGB as a joint effort to protect, monitor, and sustain the natural and cultural resources; increase public awareness, increase educational and interpretive resources; enhance and restore areas that have experienced human-caused or natural adverse effects; and enhance the quality of recreational opportunities in GBNM in a way that also protects the landscape.

While FOGB activities were substantially hindered by the ongoing pandemic, the team was able to contribute volunteer hours to resource protection initiatives and hikes throughout the monument. Specifically, FOGB participated in a National Public Lands Day project. While coordinating with the BLM, 20 volunteers contributed their time to cleaning up multiple sites. FOGB also held monthly cleanups from October through December.

Leaning to the educational element of their mission, FOGB held an online Speaker Series focusing on natural elements of Gold Butte to draw the average person out of the city and into the monument’s natural landscape to reap the benefits the Paiute people have long known were critical to good health.

FOGB led hikes, completed small restoration projects, provided site monitoring, and

maintained a significant presence throughout Gold Butte during a very challenging year.

Friends of Nevada Wilderness

The mission of Friends of Nevada Wilderness (FONW) is “preserving all qualified Nevada public lands as wilderness, protecting all present and potential wilderness from ongoing threats, educating the public about the values of and need for wilderness, and improving the management and restoration of wild lands.”

The FONW joined and participated in the Seeds of Success project and monitored “sky brightness” in the monument for urban light pollution. Unfortunately, volunteer events were canceled for the majority of the year, but they are stalwart to their goals and they are re-initiating volunteer stewardship in Spring 2021.

Partners in Conservation

The mission of Partners in Conservation (PIC) “is an information conduit that fills the gap between rural communities and government entities; develops specific partnerships to resolve conservation, recreation, and public land issues; PIC also develops specific partnerships and administers common-sense projects that provide win-win opportunities for all involved.”

PIC provides the BLM insight on the thoughts and concerns from the rural communities that surround GBNM.

Virgin Valley Water District

The Virgin Valley Water District (VVWD) has numerous water rights within the monument. These water rights are critical to meet the future water needs of the communities of Bunkerville and Mesquite. The Las Vegas Field Office continues to work collaboratively with the VVWD to ensure that rights-of-way for water delivery needs are authorized.

Volunteers

Volunteer activity was reduced this year with ongoing public health and safety concerns. Small groups were able to conduct conservation initiatives with the assistance and coordination of our partner groups.

A total of 20 volunteers, for a total of 160 hours, participated with a cleanup on National Public Lands Day. The monument also received sporadic volunteer aide through site visits, monitoring and trash pickup during unofficial visits.

Wild Horse and Burro

The Acceptable Management Level (AML) for wild burros in the Gold Butte Herd Management Area (HMA) is 22-98 animals. Current population estimates as of September 2020 are approximately 546 wild burros. These numbers include animals that reside on BLM-administered lands within the HMA and do not account for animals that may be residing on lands administered by the National Park Service or land outside of their HMA, either publicly or privately owned.

The BLM has begun planning to bring the HMA within acceptable management levels. A wild horse and burro gather environmental assessment is being developed and removal of excess animals will be determined by national program budget and priorities.

Public Access

Safety and directional signs were installed along Gold Butte Back Country Byway with the assistance of the FOGB. The signs were funded through a grant from the Nevada Off-Highway Vehicle (OHV) Grant Program.

A road survey was conducted of the byway between Riverside Road and Whitney Pocket. Planning is ongoing for road improvements to the 21 mile stretch of the Byway to improve public access and safety.



Installation of a new monument portal sign.

Habitat Restoration

GBNM continues to be the focus of a landscape-scale re-vegetation partnership project to re-establish three important shrub and yucca species that have not recovered from wildfires of 2005. During FY 2020, BLM seeded and planted 24 "habitat islands" distributed across an approximate 500-acre area.

Riparian Management

Restoration of riparian and aquatic habitat at three springs in Gold Butte began in earnest during FY 2020 and will continue in the next four years as part of an interagency effort across southern Nevada. These projects aim to improve hydrologic conditions and riparian and aquatic habitat for a rich assemblage of species including experimental populations of the relict Leopard frog that was once thought to be extinct.



An NCC crew at Bearpaw Poppy Spring installs a relict leopard frog breeding pool.

Three springs received treatment that included cutting and removing invasive species including non-native tamarisk and native cattails. Small pools were crated to enhance frog breeding habitat at Bear Paw Poppy and Quail Springs and the initial observations have shown an increase in tadpoles. Fencing to limit the impact of wild horses/burros and feral cattle for portions of each spring has been partially successful, but difficult to maintain due to tampering. BLM biologists work closely with University of Nevada, Las Vegas researchers to assess the effects of restoration and other activities on a monthly basis.

Weed Management

Tamarisk, or salt cedar, continues to be an issue in many previously treated springs. Sahara mustard continues to spread into GBNM along the Back Country Byway. Small infestations have been detected as far into the monument as Whitney Pocket. Puncturevine has also been spotted along the Back Country Byway. Tamarisk at springs continue to be monitored and treated. Monitoring continues for Malta Star Thistle, red brome and cheatgrass found throughout GBNM.

Fire Management

Gold Butte experienced one major fire during the year, burning 1600 acres of the Virgin Mountains in the northeastern portion of the monument. Portions of the Virgin Mountain Instant Study Area and the Gold Butte Part C ACEC within the monument were impacted by the fire.



Image of the burned area from the Virgin Fire

3 Science

Science

The BLM has partnered with Northern Arizona University (NAU) to study the restoration of rare plants using biological soil crusts on gypsum soils within GBNM. NAU obtained funding through the National Landscape Conservation System's annual grant program in the amount of \$25,000. Their work will try to restore impacted gypsum soils that have been crushed by illegal OHV use or trampling by wild burros or unauthorized cattle. The project is important because three of the sensitive species in GBNM (one of which is state listed as endangered) only grow on gypsum soils and are often associated with healthy biological soil crust (BSC) communities. These BSCs are important in helping the rare plants to obtain nutrients and hold water. Results of this study will improve habitat for rare plants within the GBNM and give the BLM more information about how to restore habitat for these rare plants elsewhere.

Researchers with the USGS are currently collecting data on vegetation responses, herbicide effects, small mammal distribution, and costs and benefits associated with three experimental restoration techniques. Final implementation of the project this fall will be followed by three years of vegetation sampling, analysis, and several planned publications. The project is the first attempt at landscape-scale restoration in Mojave Desert tortoise habitat. The carefully planned associated studies will help the BLM develop best management practices for restoration of burned habitat.

BLM is partnering with USDA-ARS's "bee lab" out of Ogden, Utah, to survey for and document Mojave poppy bee (*Perdita meconis*) populations in GBNM, which is an obligate pollinator of the Las Vegas bearpoppy (*Arctomecon californica*). Both the plant and the bee have been petitioned for federal Endangered Species Act listing and have had positive 90-day findings. The bee is extremely difficult to find because it is tiny, solitary (they don't live in hives like honeybees) and live in the ground (no one has ever found a nest). The goal of the project is to document the presence of this species throughout the monument ahead of the Species Status Assessment and to proactively protect habitat. USDA-ARS is also surveying for other sensitive bee species and may expand the study to better understand mutualisms between the plant and the bee (pending funding).

Another partnership with a different USDA-ARS group out of Reno is focused on studying the effects on pre-emergent herbicide on unburned areas invaded by invasive annual grasses. This study was initiated in Fall of 2019, and the first year of monitoring treatment effects took place in 2020. The goals of the project are to determine both the longevity of the treatment effect, how the herbicide impacts native species in an unburned area, and how native plants respond post-treatment (i.e. what is the competitive effect the invasive grasses have on the native plants). This is important for better understanding how invasive annual grasses impact tortoise habitat and tortoise forage, which are primarily native annual plants.

Researchers with the USGS Nevada Water Science Center are currently collecting and analyzing water samples from Bear Poppy, Horse, Quail, and Red Rock Springs in Gold Butte National Monument to provide information on possible sources of water to the springs. The water samples are being analyzed for major ions, trace elements, stable isotopes of hydrogen and oxygen, dissolved gasses, chlorofluorocarbons (CFCs), sulfur hexafluoride (SF₆), and tritium/helium. The analyses is performed at the USGS National Water Quality Lab (NWQL), the USGS Reston Stable Isotope Laboratory (RSIL), and the USGS Reston Groundwater Dating Lab (RGDL). The results of laboratory analyses will be accessible to the public from the USGS National Water Inventory System web portal.



Red Rock Springs Monitoring Site Visit by USGS and BLM Resource Staff

Laboratory results will be analyzed and interpreted. Anticipated analyses include:

- a. Major ions and trace elements data will be used to evaluate water-rock interactions along spring-water flow paths.
- b. Hydrogen and oxygen isotope data will be compared to isotope data from nearby springs that have sources of water that have been identified previously.

c. Dissolved gasses, CFCs, SF6, and tritium/helium data will be used to evaluate the age of the spring water and to determine the elevation and temperature of the source water when it entered the groundwater system.

4 Resources, Objects, Values and Stressors

Cultural/Archeological

GBNM contains an extraordinary variety of diverse and irreplaceable historic and prehistoric cultural resources, including many sites important to the history and identity of Native Americans, and remnants of our Western mining and ranching heritage. The landscape reveals a story of thousands of years of human interaction with this harsh environment and provides a rare glimpse into the lives of Nevada's first inhabitants, the rich and varied indigenous cultures that followed, and the eventual arrival of Euro-American settlers.



Petroglyphs at the Falling Man Complex

GBNM's dynamic environment has provided food and shelter to humans for at least 12,000 years. Remnants of massive agave roasting pits, charred remains of goosefoot and pinyon pine nuts, bone fragments, and projectile points used to hunt big horn sheep and smaller game serve as evidence of the remarkable abilities of indigenous communities to survive across this desert landscape. GBNM contains ancient rock shelters and hearth remnants concealed in the Aztec Sandstone formations. This sandstone is the canvas for the monument's spectacular array of rock art, depicting

human figures, animals, and swirling abstract designs. Pottery sherds and other archaeological artifacts scattered throughout the landscape reveal the monument's role as a corridor for the interregional trade of pottery, salt, and rare minerals.

By the time Spanish explorers arrived in the region in the late eighteenth century, the GBNM was home to the Southern Paiute people, who to this day retain a spiritual and cultural connection with the land. Early settlers grazed livestock and explored GBNM's unique geology in pursuit of mining riches. Their activities left behind historic sites and objects that tell the story of the American West, including the Gold Butte Townsite, a mining boomtown established in the early 1900s, but mostly abandoned by 1910. In the 1930s, the Civilian Conservation Corps was put to work in the area, leaving behind a variety of historic features including a dam and remnants of a camp in the Whitney Pocket area in the northeastern region of GBNM.

Cultural/Archeological Status and Trend Table

Status of Resource, Object, or Value	Trend
Fair	Slowly declining

Cultural/Archeological Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Objects	Acres Monitored in FY
296,937	10	25	35

Stressors Affecting Cultural/Archeological

Cultural resource sites are under imminent threat from the impacts of recreational use, which have already resulted in the dismantling of archeological features and other damages due to foot traffic and unauthorized artifact collection. Sites most affected by this unauthorized collection are rock shelters with associated artifact scatters, as well as areas that are likely to contain human burials. Common impacts to petroglyph areas in the region are graffiti and scratching on the panels and glyphs. Other impacts to the sites in GBNM are trash/dumping, firearm use, campfires, unauthorized vehicle use, and unauthorized cattle grazing.

Desert Tortoise

Habitat for the Mojave population of the Desert tortoise is below 4,500 feet elevation in the Creosote bush-bursage series of the Mojave desert scrub biome. Dominant plants are Creosote bush (*Larrea tridentata*) and White bursage (*Ambrosia dumosa*). Desert tortoise habitat may also include various cacti species (*Opuntia* spp.), saltbush (*Atriplex* spp.) scrub, and Joshua tree (*Yucca brevifolia*) forests at elevations up to approximately 5,000 feet.

Primary constituent elements for the Desert tortoise are those physical and biological attributes that are necessary for the long-term survival of the species. These elements

are sufficient space to provide for movement, dispersal, and gene flow; sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Mojave Desert tortoises are typically active during the day and when annual plants are most abundant--during spring and early summer; however, they can also be active following rain events and unseasonably warm periods during fall and winter. If rain events occur at night, tortoises may emerge from their burrows to drink. Female Desert tortoises construct nests during the late afternoon and evening and any Desert tortoise may emerge from its burrows at night during extreme heat. Desert tortoises usually spend the remainder of the year in shelter sites escaping the extreme weather conditions of the Mojave Desert.

Desert Tortoise Status and Trend Table

Status of Resource, Object, or Value	Trend
Good	Stable

Desert Tortoise Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	186,909	186,909	0

Tortoise habitat exists throughout GBNM below the 4500 ft elevation threshold in habitat described above.

Stressors Affecting Desert Tortoise

GBNM continues to experience an increase in visitation. Increased visitor use and vehicle traffic increase risks to tortoise and their habitat by direct mortality and disturbance through use by visitors in occupied tortoise habitat.

Motorized recreation results in mortality and permanent habitat loss from activities that fragment and degrade habitats, which include the proliferation of roads and trails and increased habitat invasion by nonnative invasive species.

Non-motorized recreation such as camping, hunting, target shooting, rock collecting, hiking, horseback riding, biking, and sightseeing can also result in impacts to both tortoise and their critical habitat from increased visitation.

Increased frequency of wildfire due to the invasion of non-native plant species has burned thousands of acres of tortoise habitat. Changes in plant communities caused by

non-native plants and recurrent fire can negatively affect the Desert tortoise by altering habitat structure and species available as food plants.

Vegetation

The 296,937-acre GBNM ranges in elevation from 1,420 feet – 8,051 feet and hosts a diversity of plant and wildlife species due in part to the convergent vegetation influences of the Mojave, Great Basin, and Sonoran deserts and the Colorado Plateau. The steep elevation gradients and complex orthography of the basin and ranges can affect localized seasonal temperature and precipitation patterns. The most common habitat types include Mojave mixed scrub and creosote (*Larrea tridentata*) – bursage (*Ambrosia dumosa*) desert scrub. Substantial wash systems and geomorphologic formations such as rocky outcrops, erosional highlands and sand sheets provide a unique range of habitat types for many organisms and plant communities.

There are seven sensitive plant species within GBNM; Las Vegas bearpoppy (*Arctomecon californica*), Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*), three-cornered milkvetch (*Astragalus geyeri* var. *triquetrus*), Blue Diamond cholla (*Cylindropuntia multigeniculata*), Beaver Dam breadroot (*Pediomelum castoreum*), sticky buckwheat (*Eriogonum viscidulum*), and chalk liveforever (*Dudleya pulverulenta*). There is also a sensitive moss, *Didymodon nevadensis*, which occurs on gypsum soils within the monument. Two of these plant species are state endangered. This is the highest concentration of sensitive plant resources that occurs within a special protection area in southern Nevada, with exception of Ash Meadows National Wildlife Refuge (which has one of the highest rates of endemism in the country).

Large-scale fires in 2005 burned many acres of native vegetation in the GBNM, most of which has become a monoculture of red brome, an invasive grass species. These fires and the coupling of invasive species' presence is detrimental to native plant communities. Additionally, grazing pressure exists in the GBNM from unauthorized cattle grazing and overpopulated herds of wild burros. BLM Assessment, Inventory, and Monitoring (AIM) data over the last seven years shows high cover of invasive annual grasses throughout the GBNM, a lack of native perennial grasses where one would expect to see high cover of perennial grasses due to the site potential, and moderate to extreme departures from reference conditions due to the aforementioned factors.

Vegetation Status and Trend Table

Status of Resource, Object, or Value	Trend
Poor	Stable

Vegetation Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	296,937	296,937	150,000

Stressors Affecting Vegetation

Fire, invasive species, overpopulated wild burros, and unauthorized cattle grazing are all responsible for negatively impacting vegetation resources. Negative feedback loops exist between all four issues. Invasive species, most notably red brome, have become monocultures in burned areas from large fires in 2005 in the GBNM. These plants are more susceptible to future fires and crowd out native plants. The grazing pressure reduces the amount of forage plants (notably perennial grasses) that remain on the landscape.

When added to the amount of area burned in the GBNM, very little native forage remains for native wildlife species and native plant communities are not able to recover from fire or grazing. These heavily impacted vegetation communities are not resilient to other outside stressors and therefore cannot recover easily after fire, OHV intrusion, or climate impacts. Over time, these other stressors will further degrade vegetation communities in GBNM unless deliberate actions are taken to alleviate these pressures.

Infestations of Sahara mustard, a state noxious weed, are common along the I-15 corridor north of Gold Butte and have been spreading throughout Gold Butte over the last several years. Sahara mustard is now common in popular camping sites near Whitney Pocket, where it is likely picked up by the vehicles camping there and spread further into GBNM.

Wild Horse and Burro

Wild horses and burros can be found throughout 10 western states, including Nevada. The wild burros (burro is the term used for a wild donkey) are the descendants of donkeys that were released by miners who resided within the area during the late 19th and early 20th century.



Wild Burros photographed during a site visit early in 2020.

Wild Horse and Burros Status and Trend Table

Status of Resource, Object, or Value	Trend
Good	Declining

Wild Horse and Burros Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	Varied*	170,354	Varied **

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
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Acres inventoried within the HMA are limited to vehicle accessibility and therefore, vary. Key forage species are inventoried each spring in 15-25 different areas within the HMA to monitor the amount of forage being consumed within the HMA.

A full aerial survey of the HMA was conducted in FY19. With the use of a helicopter, transect lines spaced ½ to ¾ of a mile apart are flown throughout the entirety of the HMA and the surrounding areas using the simultaneous double count method. Data is then verified and analyzed by the USGS before distribution to the BLM and the public.

Stressors Affecting Wild Burros

Wild burros are dependent upon vegetation and natural spring resources found within GBNM. The drought that has occurred over the past several years has affected both resources in a negative way. Wildfire has affected vegetation production within the HMA, creating room for invasive species, such as red brome and cheatgrass that have replaced more highly palatable species, such as *Ephedra nevadensis*, Big galleta, and Indian ricegrass. The drought has affected the hydrology of the HMA and as a result many water resources go dry, either temporarily or in some cases permanently. This has resulted in many of the burros moving to and residing permanently on National Park Service and private lands.

Overpopulation may be affecting wild burro populations due to the limited resources that are present within the monument. Wild burro populations double every four years due to having very few natural predators and having a highly successful rate of raising foals. As herd numbers increase it puts further strain on the limited resources within the Mojave Desert ecosystem. Acceptable Management Levels (AML) are established based off modern rangeland monitoring and scientific methods and are periodically updated to ensure that rangeland health standards are being met within Herd Management Areas. For wild burros, the AML is 22-98 animals.

Invasive Species/Noxious Weeds

Nevada State listed noxious weed species found in GBNM include Malta starthistle (*Centaurea melitensis*), saltcedar (*Tamarix ramosissima*), Sahara mustard (*Brassica tournefortii*) and puncturevine (*Tribulus terrestris*). The Nevada Department of Agriculture categorizes state listed noxious weeds into three categories: A, B, and C. Category A noxious weeds are subject to active exclusion and eradication wherever found, Category B weeds require active exclusion where possible, and Category C weeds require active eradication from the premises of a dealer of nursery stock. Malta starthistle is classified Category A, indicating the occurrence of these species is limited throughout the state, thus all infestations must be actively controlled with the goal of eradication. Sahara mustard is classified Category B and must be excluded where possible. Saltcedar and puncturevine are Category C noxious weeds, indicating the species are generally well established and widespread in Nevada. Historically, puncturevine populations have been small in southern Nevada but appear to be expanding. Tamarisk and Sahara mustard are known to contribute to wildfire problems.

Puncturevine “fruit” have spines which can cause injury to livestock and humans and can also puncture tires. Puncturevine foliage can be toxic to livestock.

There are also species in Gold Butte that are non-native and invasive but legally not designated as noxious by the State of Nevada. The following invasive plant species can be found in GBNM: Various brome species (*Bromus rubens*, *Bromus tectorum*, and *Schismus spp.*), London rocket (*Sisymbrium irio*), African mustard (*Malcolmia africana*), and Russian thistle (*Salsola spp.*). Tamarisk, or salt cedar, has re-sprouted in many previously treated springs. No new springs were inventoried in FY2020. Heavy tamarisk populations occur along the Virgin River and near Lake Mead. Sahara mustard was found spreading into Gold Butte along the scenic byway. Small infestations were detected as far into the monument as Whitney Pocket. Puncturevine has also been spotted along the byway. These infestations are reported as small. In 2019, above average brome grass populations contributed to heavy fine fuel loading which led to the Bonelli Peak Fire.

Invasive Species/Noxious Weeds Status and Trend Table

Status of Resource, Object, or Value	Trend
Fair	Declining

Invasive Species/Noxious Weeds Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	40,000	30,000	5

Stressors Affecting Invasive Species/Noxious Weeds

GBNM is an important regional destination and more people are expected to visit Gold Butte. Increased visitation will potentially bring more disturbance and invasive plant seeds. This could increase the amount of invasive and weed species already in the area and bring new invasive species to the area. OHV use can disturb soils which will create an area for invasive species to grow. Wildfires may create large swaths of disturbance where invasive species thrive, and native species have very poor recruitment. The effects of previous fires are still obvious. Weather patterns in the area of GBNM are critical because changes in precipitation patterns and temperature affect plant communities. Increased precipitation can help native species in a harsh environment but can also lead to an increased grass crop that contributes to the annual grass-fire cycle. Above average precipitation in the spring of 2019 resulted in an above average brome grass in 2019. Unauthorized cattle grazing is contributing to the spread of invasive annual grass, other fire prone invasive species, and noxious weeds. Gold Butte AIM data is showing that the area is trending towards type conversion from native plant

species to invasive annual grass. Increased brome grass is likely to lead to an expanding invasive annual grass fire cycle.

Wildland Fire and Fuels

Wildfires can benefit ecosystems or damage them. Much of the Mojave Desert, including much of the GBNM, is not fire adapted. The desert tortoise and its habitat are not fire adapted. Historically, infrequent low to moderate severity fire played a role in some native plant communities, promoting plant and wildlife habitat diversity in a mosaic pattern. Most native plant populations in the Mojave Desert are discontinuous and usually do not support fire spread. As a result, wildfires under normal conditions tend to be small. This condition has changed in the presence of plant invaders.

Wildfire size in Gold Butte has ranged from 0.1 to over 80,000 acres. In 2005, over 100,000 acres burned in GBNM during the Southern Nevada Complex, primarily due to the abundance of invasive annual grass present at that time. In 2019, extensive invasive annual grass filled in native plant interspaces and created a continuous combustible fine fuel bed, especially in previously burned areas. This resulted in the first large fire in GBNM since 2005. The 2019 Bonelli Peak Fire had the potential to re-burn much of the area burned in 2005 however, firefighters were able to contain and control the fire at less than 5,000 acres through safe and effective fire response.

The primary fuels and fire management objective in GBNM is for public and firefighter safety through safe and effective fire response. Fuels management and restoration activities seek to reduce wildfire risk by maintaining or restoring native plant communities and preventing or reducing invasive plant infestations. Also important is preventing human caused fires through enforcement, education, and outreach activities.

Fire/Fuels Status and Trend Table

Status of Resource, Object, or Value	Trend
Fair in unburned areas. Poor in burned areas.	Declining

Fire/Fuels Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	50,000	50,000	0

Stressors Affecting Fire/Fuels

Previously burned areas have not recovered and invasive brome grass dominates burned areas. Unauthorized cattle grazing has contributed to decreased ecosystem health through direct impacts to native plant communities. This is supported by BLM AIM data. Native GBNM grasses are considered ephemeral, which means they only occur when favorable weather conditions such as sufficient precipitation are present to promote growth. The GBNM is within the Mojave ecoregion which is known for its very

low annual precipitation. Native and invasive plant species are very dependent on precipitation frequency and occurrence. Cattle are known vectors for spreading noxious and invasive plant species including cheatgrass and red brome. The conversion of native plant communities to fire prone invasive annual grass is the primary stressor. Wildfires burning in cheatgrass or red brome typically remove and replace native vegetation. Because of invasive annual grass, propagule pressure, and the presence of noxious weeds on adjacent lands, future wildfires will continue to be problematic.

There is a need for increased enforcement, public outreach and education on wildfire hazards and the impacts of wildfire to the environment. Human caused fires account for more than 50 percent of all wildfires in southern Nevada. Future increased visitor use is likely to increase human caused fires in GBNM.

GBNM AIM data has documented a significant shift from native plant species to highly combustible plant invaders. This trend means an expanding annual grass fire cycle is likely to result in type conversion to invasive annual grass at the landscape level. Increased presence of invasive annual grass above historic levels is an indicator there is an increased risk for large, catastrophic fires in the GBNM. LVFO's Restoration Program has initiated the Burn Area Recovery Project with the intent to promote and restore native vegetation and reduce invasive annual grass in burned areas. The Bonelli Peak Fire Emergency Stabilization and Rehabilitation (ESR) Plan includes measures to control plant invaders and promote natural recovery.

Hydrologic Conditions

GBNM is located within the Colorado River hydrographic region or basin. The region is further divided into three hydrographic areas (listed below) which are partially contained within the planning area.

Hydrographic Area	Region/Basin	Number
Virgin River Valley	Colorado River Basin	222
Gold Butte Area	Colorado River Basin	223
Greasewood Basin	Colorado River Basin	224

The three hydrographic areas within the Colorado River Basin are tributaries to the Colorado River. Approximately 210,000 acres, or 71 percent, of the national monument drain into the Gold Butte Area Hydrographic Basin and 70,000 acres, or 24 percent, drain into the Greasewood Basin, both of which contribute to Lake Mead and the Colorado River. The remaining 15,000 acres, or 5 percent, of the GBNM drain into the Virgin River Valley Hydrographic Basin and eventually into the Virgin River and to the Colorado River.

Surface Water

Surface water occurrence is far less abundant than groundwater and is limited to springs and ephemeral streams. Streams such as Nickel Creek and Cabin Canyon Creek, during most years, flow short distances for short periods of time, primarily during early spring. Numerous ephemeral washes transect the area, conveying flows only in

response to storm events. These drainages are subject to short-duration, high-intensity thunderstorms which produce rapid runoff and, at times, flash flooding of downslope areas. Mud Wash and Quail Spring Wash are the more significant drainages; however, there are no drainages or areas within the monument that are classified as Flood Hazard Areas by the Federal Emergency Management Agency (FEMA).

High-intensity thunderstorms often produce rapid runoff and flash flooding which can result in floodwater and sediment damage within the region. Flash flooding, which has been on the increase, usually occurs from tropical depressions out of the south or southwest.

Springs are important water sources in the monument as with the rest of southern Nevada. A total of 128 springs have been identified within the planning area. The average flow of these springs is less than one (1) gallon per minute (gpm), with some springs being nothing more than a seep area with little discernable flow, while others measured as high as three (3) gpm.

Groundwater

Groundwater is vital in this region of few surface water sources. Depth to water varies throughout the monument, but it can be generally characterized as ranging from at or near the surface to several hundred feet.

Most groundwater recharge in southern Nevada is derived from winter and spring precipitation, representing approximately one-half of the total annual precipitation. The moisture is stored in snowpack at elevations of 7,000 feet and higher. Precipitation reaches the groundwater reservoirs by way of streams which eventually discharge onto alluvial aprons or by infiltrating directly into consolidated rock and percolating vertically and laterally to the valley fill aquifer. Additional inflow is received from localized intense storms and groundwater discharge from adjacent areas. Natural discharge of groundwater in the basins occurs as a result of transpiration from phreatophytes (deeply rooted plants that obtain water from the water table or the soil layer just above it), spring discharge, evaporation from bare soil, interbasin flow, and base flow to streams.

Water Quality

In Southern Nevada, one critical water resource problem is the poor quality of much of the surface and ground water. Several factors contribute to the high quantities of chemicals and solids in the regional water. High evaporation rates leave concentrations of salts at or near the soil surface after rainfall. The composition of rocks and soils, often containing calcium, magnesium, carbonates, silicates, metallic and nonmetallic minerals, also affects water quality. As water moves slowly into and through the soil profile, it dissolves and acquires these constituents. In addition, dust containing salts is blown from playas onto standing surface water and onto soil where it enters both surface and groundwater.

Levels for turbidity, total dissolved solids, sulfate, chloride, manganese, iron, and nitrate nitrogen exceeded Federal standards in several springs. Many of these levels do not pose health hazards; only nitrate nitrogen is potentially dangerous.

The quality of groundwater varies throughout the GBNM, as it does in the remainder of the state. In general, groundwater in areas of recharge has low chemical concentrations, but as it moves through the groundwater system to discharge areas (i.e. valley bottoms), it dissolves sediment and rock materials. The extent to which chemical constituents are dissolved is largely determined by these factors: 1) the solubility, volume, and distribution of the materials; 2) the length of time that the water is in contact with the materials; 3) the distance that the water travels from the point of recharge; and 4) the temperature and pressure within the groundwater system.

Hydrologic Conditions Status and Trend Table

Status of Resource, Object, or Value	Trend
Poor	Stable

Hydrologic Conditions Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	N/A	N/A	N/A

Stressors Affecting Hydrologic Conditions

Impacts to surface water resources result from both natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, disturbance from wildlife, and high precipitation events resulting in high flow. Anthropogenic impacts include driving off-road vehicles; grading for rights-of-ways, unsustainably high numbers of wild burros and unauthorized livestock; roads, trails, and associated drainage, dumping, invasive weeds, and water use by water rights holders.

Riparian/Wetlands

Riparian and wetland areas are sensitive vegetative or physical ecosystems that develop in association with surface or subsurface water. Riparian and wetland ecological systems comprise only a small portion of the GBNM, but they are among the most important, productive, and diverse ecosystems on the landscape. Benefits from riparian/wetland ecosystems are essential to both human and wildlife values and includes the following:

- Maintaining clean renewable water supplies.
- Providing for diverse plant and wildlife ecosystems, including special status species.
- Importance in cultural and historic values.
- Greenbelt-associated recreation and scenic values.

- Thermal/shade protection, which is especially important within the arid Southwest.

Riparian and wetland areas include, but are not limited to; areas adjacent to waterways (whether waters are surface, subsurface, or ephemeral), springs, potholes, wet meadows, floodplains, and reservoirs. Riparian areas are recognized as a form of wetland transition between permanently saturated wetlands and upland areas. For BLM purposes, riparian and wetland areas are referred to synonymously unless specifically discerned. The BLM utilizes various tools to describe, analyze, and evaluate riparian/wetland ecosystems relative to their potential and capability to achieve a properly functioning and healthy ecosystem.

Riparian habitats are fragile resources and are often among the first landscape features to reflect impacts from management activities. These habitats are used as indicators of overall land health and watershed condition. A healthy riparian system will filter and purify water as it moves through the riparian zone; reduce sediment loads and enhance soil stability, reduce destructive energies associated with flood events, provide physical and thermal micro-climates in contrast to surrounding uplands, and contribute to groundwater recharge and base flow. Within most riparian systems in the arid southwest, the potential of a riparian ecosystem is strongly dependent upon the availability of water. The degree, timing, and source of water availability, among other physical factors, is commonly referred to in terms of perennial (yearlong), interrupted (perennial flow discontinuous in space), intermittent (seasonal), or ephemeral (storm) water sources.

Riparian/Wetlands Status and Trend Table

Status of Resource, Object, or Value	Trend
Poor	Stable

Riparian/Wetlands Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	500	500	3

Stressors Affecting Riparian/Wetlands

Riparian resources within the monument are limited. These resources are managed for conservation and public use. Impacts to surface water resources result from both natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, disturbance from wildlife, and high precipitation events resulting in high flow. Anthropogenic impacts include driving off-road vehicles; grading for rights-of-ways, unsustainably high numbers of unauthorized livestock as well as wild burros; roads, trails, and associated drainage; dumping; invasive weeds; and water use by water rights holders.

Soils

Throughout GBNM, there is a sharp contrast in physiography between mountainous areas and lowlands. Soils in the area developed under different environmental influences. Under the arid conditions which prevail at all but the highest elevations, little downward movement of the soluble constituents of the soil occurs. Most leaching is confined to the translocation of the soluble material (usually lime) from the surface to the subsoil, with the resultant formation of a hardpan. These soluble salts are usually leached only to a depth of one to two feet.

In this climate, rocks tend to break down by disintegration rather than by decomposition. Mechanical breakdown (spalling) is more common than chemical action. As a result, mountains are covered with a thin veneer of rock fragments. Cloud bursts and showers sweep large quantities of this material into ravines and valleys, forming alluvial fans of the coarser material. Finer-grained sediments are washed into the lowlands.

Wind is also an active agent in soil genesis. Wind-blown sand is common, with the greatest accumulations found in the lower valleys, often forming dunes. Wind-blown silts, mixed with the fine alluvium washed down from the slopes, comprises the soil mantle of the lowlands. The term "blow sand" arises from the fact that much of the surface soil is wind deposited.

Organic matter in most desert soils is far less than the average 3 to 5 percent by weight contained in soils formed in humid regions. Even in a wet year when spring annuals are abundant, much of the vegetal matter is oxidized by the summer heat before it can be turned into humus. A gravelly surface, referred to as "desert pavement", can be found in the monument. A desert pavement is an arid land surface that is covered with closely packed, interlocking angular or rounded rock fragments of pebble and cobble size. A notable feature of desert pavements is the development of the so-called "vesicular A" soil horizon just below the surface of pebbles, gravels, and small stones that form the ground surface of desert pavement. The soil horizon layer consists of dust-sized wind-deposited particles underneath the pavement. Most of the particulate matter consists of very fine silt and fine sand. The desert pavement surface is stable and resistant to erosion when not disturbed. Erosion is normally active on surfaces lacking a desert pavement. The sparse cover of vegetation does little to reduce wind and water velocities. Wind erosion is a major factor in recharging surface soils with carbonates through the movement and deposition of calcareous dusts.

Soils in the monument are primarily Entisols and Aridisols. These are described in detail below. The Entisols have little or no evidence of development of pedogenic horizons. They are located in areas where the soils are actively eroding (steep slopes) or receiving new deposits of soil materials (alluvial fans and floodplains).

Aridisols have one or more pedogenic horizons that may have formed in the present environment or that may be relics from a former pluvial period. These soils do not have water available to plants for long periods of time and the surface is generally bare. Aridisols are often associated with desert pavement.

Some areas of the GBNM support biological soil crusts (biocrusts: a soil surface consortium of cyanobacteria, mosses, and lichens) which can also be reduced or destroyed by fire. Biocrusts perform a variety of relevant functions which enhance habitat quality. They aggregate soil, reducing erosion susceptibility, a function that is especially relevant where soils are naturally erodible and rock cover is sparse. Biocrusts also create and maintain soil fertility. In some ecosystems present in GBNM, biocrusts enhance infiltration rates compared to uncrusted soils. Finally, they may also discourage invasion by exotic annual grasses. Restoration of soil health would be expected to promote vegetation recovery.

Soils in the GBNM have been surveyed previously by the Natural Resources Conservation Service (NRCS). Soils were mapped as a part of the Soil Survey of Clark County, Nevada, in 2006. The surveys contain detailed soils descriptions, supporting data, and maps.

Soil erosion involves two processes: 1) a detachment or loosening influence, and 2) transportation by means of floating, rolling, dragging, and splashing. Freezing and thawing; flowing water; and rain impact provide the detaching agents. Raindrop splash and especially running water facilitate the carrying away of loosened soil. On comparatively smooth soil surfaces, the beating of rain drops results in most of the detachment.

During the high intensity, short duration thunderstorms that are common in the region, raindrop impact tends to destroy soil aggregates, enhance sheet and rill erosion, and encourage considerable transportation by splashing. A hard crust often develops upon drying. This crust impedes seedling emergence, greatly reduces infiltration for the next storm, and limits the possibilities for vegetative shielding which, by absorbing the energy of rain impact, prevents the loss of both water and soil and reduces degranulation to a minimum. However, in some desert locations, this surface crust does cover loose, fine soil particles, resulting in limited protection from wind erosion. In the vegetation types offering generally sparse cover, little interception of precipitation or protection from overland flow of water occurs.

As is the case with water erosion, the loss of soil by wind movement also involves detachment and transportation. The abrasive action of the wind results in some detachment of tiny soil grains from the granules or clods of which they are a part. When the wind is laden with soil particles, its abrasive action is greatly increased. The impact of these rapidly moving grains dislodges other particles from soil clods and aggregates. The cutting and abrasive effects, especially of sand, upon tender leaves and vegetation is harmful.

Erosion susceptibility is a measure of the erosion potential of a soil whose surface has been disturbed. Wind and water erosion potential are used to determine susceptibility in an area. Soil surveys conducted by the Natural Resources Conservation Service were used in the development of erosion susceptibility ratings for the area.

Soils Status and Trend Table

Status of Resource, Object, or Value	Trend
Poor	Stable

Soils Inventory, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	296,937	296,937	0

Stressors Affecting Soils

Impacts to soil resources result from both natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, disturbance from wildlife, and high precipitation events resulting in high flow. Anthropogenic impacts include driving off-road vehicles; grading for rights-of-ways, unsustainably high numbers of wild burros as well as unauthorized livestock; roads, trails, and associated drainage; dumping; and invasive weeds preventing the formation of natural soil crust.

Wilderness

The Wilderness Act of 1964 established the National Wilderness Preservation System and officially designated wilderness as a resource. The BLM was originally not a wilderness managing agency; however, with the passage of the Federal Land Policy and Management Act of 1976 (FLPMA) the BLM became the 4th agency with wilderness management responsibilities under the Wilderness Act. The Wilderness Act mandates that each administering agency preserve or enhance the wilderness character of designated areas. Wilderness character is defined in the Wilderness Act and is composed of 4 mandatory qualities and a 5th optional quality:

1. Untrammeled: wilderness ecological systems are essentially unhindered and free from intentional actions of modern human control or manipulation.
2. Undeveloped: being without structures or installations, the use of motorized vehicles, motorized equipment, or mechanical travel. The area is retaining its primeval character of influence, without permanent improvements or human habitation, where the imprint of man's work is substantially unnoticeable.
3. Natural: a place where ecological systems are substantially free from the effects of modern civilization.
4. Solitude or Primitive and Unconfined Recreation: wilderness provides opportunities for visitors to experience: natural sights and sounds, remoteness, isolation, and unfrequented or secluded places. There is freedom, risk, physical and emotional challenge, self-discovery, self-reliance, and lack modern societal pressures.
5. Other Features of Value: the monument may contain ecological, geological, or other features of scientific, educational, scenic, or historical value. When these

other values are present, they are part of the monument's wilderness character and must be preserved as such.

The GBNM has two congressionally designated wilderness areas: Jumbo Springs and Lime Canyon Wilderness. These areas were added to the National Wilderness Preservation System by the Clark County Conservation of Public Lands and Natural Resources Act of 2002 (Public Law 107-282; November 6, 2002).

Wilderness Status and Trend Table

Status of Resource, Object, or Value	Trend
Good	Stable

Wilderness, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
28,470	0	28,470	9000

Stressors Affecting Wilderness

Positive, negative, and potential impacts to wilderness character of both the Lime Canyon and Jumbo Springs Wilderness Areas are identified below:

Untrammelled

In FY 2020 there were no known trammeling actions; either administrative or unauthorized. The increase in invasive non-native vegetation is negatively impacting the natural character of the wilderness areas, trammeling action may be needed in the future to address this increase.

Much of the GBNM is not fire adapted, meaning fires are not frequent and have low severity. However, invasive annual grasses are changing the natural fire cycle, trammeling fire suppression action may be needed in the future to address the departure from the natural fire cycle.

Natural

Intrusive human activities and wildlife overpopulation impose long-term threats to the Wilderness. Unauthorized grazing, illegal vehicle access, and herd expansion are actively impacting these areas. Lime Canyon Wilderness shows persistent impacts from the unauthorized grazing as native wildlife must now compete for forage utilization. Additionally, these non-native species trample native vegetation and riparian areas impacting the natural hydrology and spread invasive non-native plants. Invasive non-native vegetation, primarily cheatgrass and red brome, continue to persist and degrade the natural character in these wilderness areas.

Similarly, the high burro population above the HML is negatively impacting the natural quality of wilderness character. Continued management of the HMLs to reduce the burro population to manageable numbers is necessary in order to protect the ecological balance of the range from threats of degradation associated with overpopulation.

Motorized and mechanized intrusions remain a threat to the natural quality of wilderness character. As the GBNM continues to grow in popularity the potential threat of vehicle intrusions also grows. Proactive management is needed to address this potential threat, restoration of closed routes and improved signage will assist in the reduction of illegal motorized use.

Native wildlife remain stable but natural and human activity threaten the stability and possible growth of the populations. The Bighorn sheep population in the wilderness areas remain viable. Hunting of the sheep within the wilderness is ongoing; however, these species continue to have potential threats -- primarily disease and reduced water resources. The Desert tortoise population in the wilderness areas are stable; nonetheless, unauthorized grazing and motorized intrusions threaten population increases.

Undeveloped

Six tenths of a mile of a two-track route remains in the wilderness areas. As visitation continues to rise, motorized or mechanized transportation trespassing remains a threat to the wilderness characteristics of these areas.

Additionally, unauthorized facilities remain a threat to the wilderness areas. These threats often arise from unauthorized developments installed to support unauthorized grazing or unsanctioned recreational facilities.

Opportunities for solitude or primitive and unconfined recreation

The wilderness areas in the GBNM continue to offer pristine opportunities for solitude or primitive and unconfined recreation. In fact, the Jumbo Springs Wilderness remains one of the most remote locations within the Southern Nevada District Office. Though the visitation to GBNM is increasing, solitude is readily available within these areas.

Weed management through the use of weed-free hay poses limitations to equestrian visitors throughout GBNM and requires the upmost of adherence within wilderness. Visitors must be knowledgeable of this resource need prior to recreating as local supplies are not readily accessible.

The growth of tourism throughout Southern Nevada has led to increased helicopter overflights throughout the monument. These overflights often interrupt the solitude of wilderness areas threatening the characteristics with noise pollution.

Unique/supplemental value

Interest in cultural resources and potential collection or destruction, continue to remain a threat to this quality of wilderness characteristic.

Wilderness Study Areas

Wilderness Study Areas (WSA) were designated through the direction in FLPMA because they were determined to possess wilderness characteristics that indicated the presence of the wilderness resource; these areas are suitable for designation as wilderness by Congress. WSAs are managed in a manner that would not impair the suitability of the areas for preservation as wilderness, while these areas are under review by Congress. Within the GBNM there are two areas managed as WSAs, the Million Hills WSA and the Virgin Mountain Instant Study Area (ISA). The total acres of the two areas are: 21,692 in the Million Hills WSA and 6,560 in the Virgin Mountain ISA.

Wilderness Study Areas Status and Trend Table

Status of Resource, Object, or Value	Trend
Good	Stable

Wilderness Study Areas, Assessment, Monitoring Table

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
296,937	28,252	28,252	1,000

Stressors Affecting Wilderness Study Areas

Motorized vehicle surface disturbance remains the primary stressor within these areas, otherwise there are few additional stressors. In FY 2020 there were no administrative actions and no known unauthorized actions that will impair these areas from wilderness designation if Congress chooses to act.

5 Summary of Performance Measure

Resources, Objects, and Values Status Summary Table		
Resource, Object, or Value	Status	Trend
Cultural/Archeological	Fair	Slowly declining
Desert Tortoise	Good	Stable
Vegetation	Poor	Stable
Wild Horse and Burro	Good	Rising
Invasive Species/Native Weeds	Fair	Declining
Fire/Fuels	Fair/Poor	Declining
Hydrologic Conditions	Poor	Stable
Riparian/Wetlands	Poor	Stable
Soils	Poor	Stable
Wilderness/Wilderness Study Area	Good	Stable

6 Manager's Letter

As the nation met the challenges of the pandemic during 2020, so too did the BLM. Plans and activities were evaluated to determine what could be accomplished while keeping our personnel, volunteers, and partners safe and healthy. We were fortunate in that many field activities could continue with adjusted protocols.

Mindful of the monument's importance to the community and the rapid growth of visitation, public outreach continues to be a priority. As community, government, and tribal meetings transitioned to virtual formats, we are excited to resume our outreach efforts and share ideas for plans, projects, and activities.

Understanding the importance of protecting the cultural heritage of Gold Butte while allowing for multi-use recreation, the completion of the environmental assessment, allowing for the implementation of protection measures at three key cultural complexes, is extremely significant. These measures will allow the BLM to begin improving visitor use areas while ensuring cultural resources are not degraded in the process.

While we are pleased with the initiation of the Historic Properties Treatment Plan and associated environmental assessment, some of the proclamation's directives remain outstanding, particularly, the preparation of a management planning document. A notable challenge to progress is the absence of a designated staff to apply focused management. It is partially a result of this that proclamation directives are not being met. The planning process will be the principal focus in the upcoming year. This initiative will be realized utilizing funds awarded through the SNPLMA project initiated in 2020.

The public's renewed interest in outdoor activities during the pandemic has led many to discover this phenomenal monument. Southern Nevada and Utah residents sought out the serenity, culture, and back country experiences that Gold Butte has to offer, confirming the extraordinariness of Gold Butte National Monument.

Lee Kirk
Monument Manager (Acting)
Las Vegas Field Office
Southern Nevada District



**NATIONAL
CONSERVATION
LANDS**

Gold Butte National Monument

Southern Nevada District
Bureau of Land Management
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