To: Lynn Roth[lroth@blm.gov]
From: Bilbao, Anita
Sent: 2017-03-09T17:33:06-05:00
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From: **Staszak, Cynthia** <cstaszak@blm.gov>
Date: Thu, Mar 9, 2017 at 3:28 PM
Subject: Reports
To: Anita Bilbao <abilbao@blm.gov>
Cc: Edwin Roberson <eroberso@blm.gov>, Gary Torres <gtorres@blm.gov>

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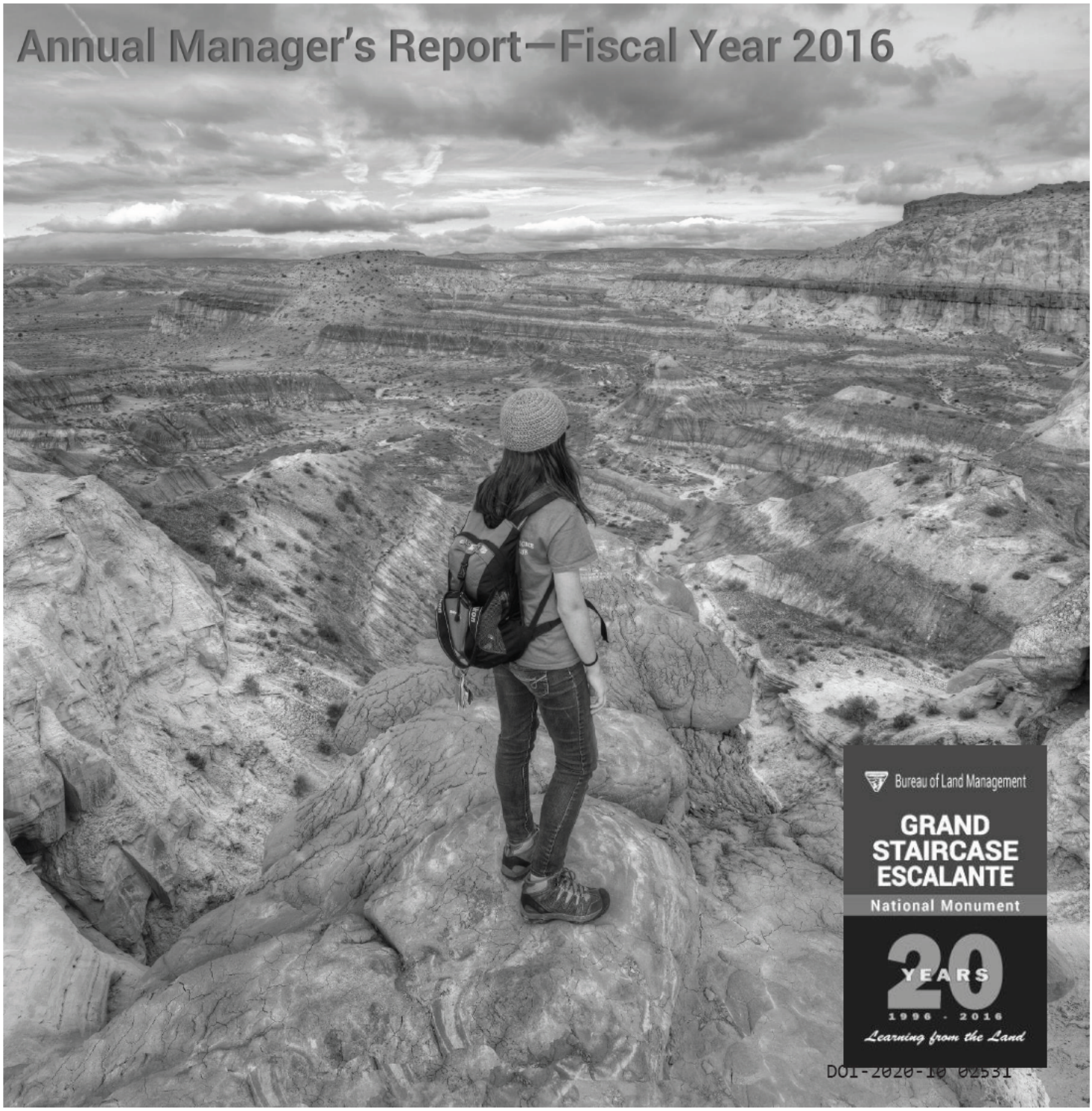
NATIONAL CONSERVATION LANDS

Utah

Grand Staircase-Escalante

National Monument

Annual Manager's Report—Fiscal Year 2016



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1 Grand Staircase-Escalante Profile

Designating Authority

Designating Authority: Presidential Proclamation 6920

Date of Designation: September 18, 1996

Acreage

Grand Staircase-Escalante National Monument (GSENM) spans nearly 1.9 million acres of America's public lands. Managed by the Bureau of Land Management (BLM), GSENM is part of the National Conservation Lands. Reporting directly to the BLM Utah State Office, the Monument Manager oversees public lands which contain some of America's most scientifically exciting and visually stunning landscapes. The Monument boundary encompasses approximately 1,880,461 total acres including 14,130 acres that are privately held. There is no state land found within GSENM.

Total Acres in Unit	1,880,461
BLM Acres	1,866,331
Other Federal Acres	0
State Acres*	0
Private Acres*	14,130

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

Contact Information

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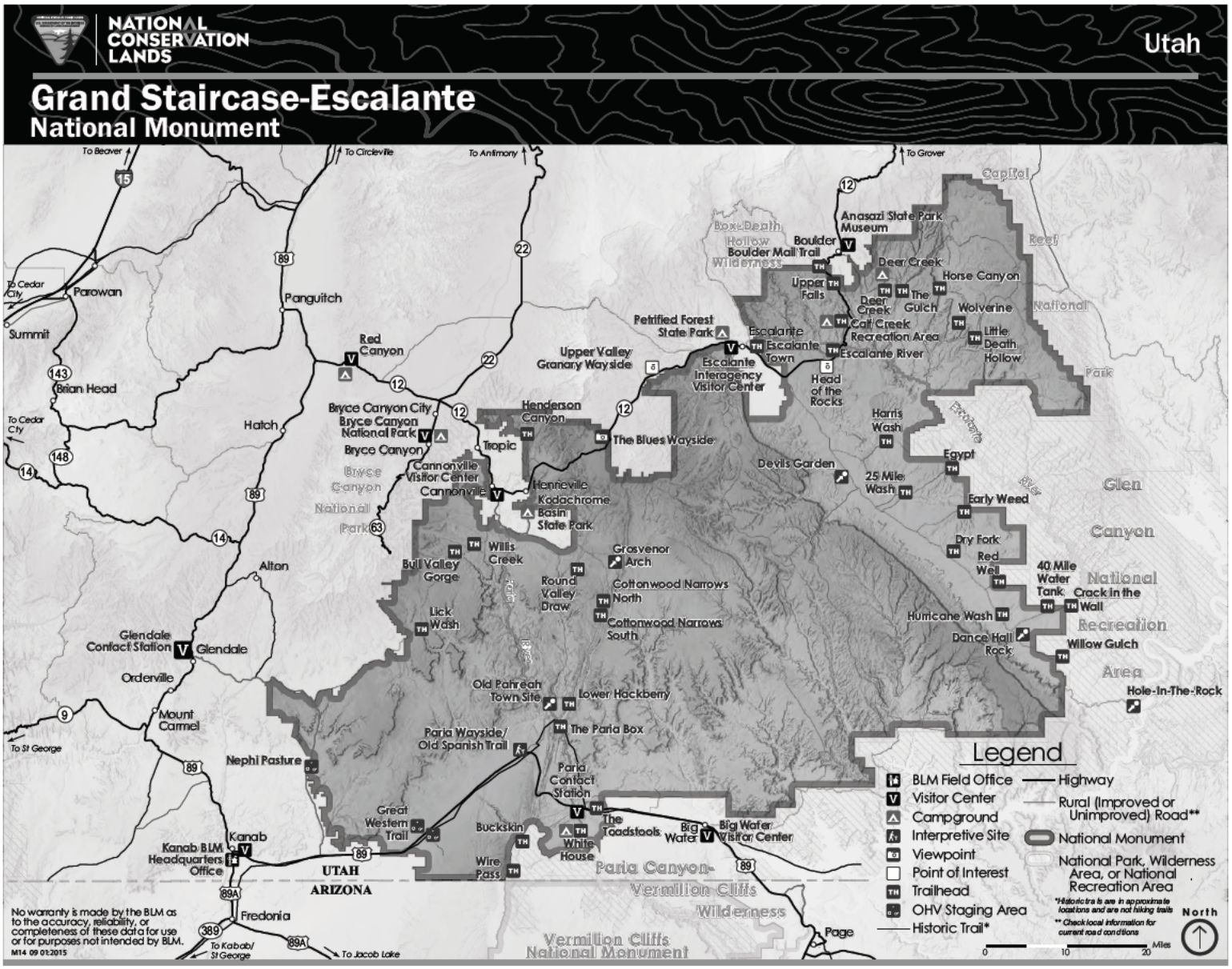
District Office Name	N/A
State Office Name	Utah



Budget

Total Fiscal Year 2016 Budget	$7,029,800
Subactivity 1711	$4,728,600
Other Subactivities' Contributions	$1,274,000
Other Funding	$1,027,200

Managing Partners

N/A

Staffing

Grand Staircase-Escalante National Monument is the largest unit in BLM's National Conservation Lands system, and the largest national monument in the contiguous United States. The Monument is comparable in program size, complexity and land base to many BLM Districts, and considerably larger than most BLM Field Offices. In BLM-Utah's organization, the Monument is equivalent to a District Office.

In FY16, Monument staff consisted of 49 full-time employees, led by two line officers, the Monument Manager and Associate Monument Manager. Staff is organized into three major functional Divisions: Planning and Support Services, Resources, and Science and Visitor Services. Monument staff includes an administrative team, facilities management, backcountry rangers, visitor center staff, planners, a science program administrator and resource specialists. GSENM serves a nationally significant conservation role for the Bureau with programs managed by resource specialists, in paleontology, archaeology, biology, botany, ecology, history, wildlife, planning and environmental coordination, range management, realty, recreation, soil, air and water, wilderness, and visual resources. Two BLM law enforcement officers are assigned to GSENM; one full time in Escalante and one shared with the Kanab Field Office in Kanab.

The Monument shares its Headquarters building; at 669 South Highway 89A, with the Kanab Field Office (a unit within BLM-Utah's Color Country District) and the two offices share front desk and administrative staff duties. The Monument also receives administrative support, primarily in property management, but also including some contracting and engineering functions, from the Color Country District.

The Monument works with the Kanab Field Office and Arizona Strip District to administer the Paria Canyon/Coyote Buttes Special Management Area (SMA) under

a Memorandum of Understanding (MOU) between the three offices. The Monument manages the Kanab Visitor Center, the major contact point for visitors to the Paria Canyon/Coyote Buttes SMA in Utah, and location of the world-famous “Wave Lottery”. Major trailheads to the Wave originate on the Monument, and Whitehouse Campground, the primary overnight camping facility for Wave permit holders, falls within the Monument boundary.

The Escalante Interagency Center, located in Escalante, Utah, is one of four Monument Visitor Centers found in the communities surrounding the Monument. This BLM facility is the only federal building located in Escalante and provides workspace for Monument staff, the Dixie National Forest-Escalante Ranger District, and Glen Canyon National Recreation Area staff.

The Monument administers grazing permits for a number of allotments which fall fully or partially within the boundaries of three other units: the Kanab Field Office (Color Country District), the Arizona Strip Field Office (BLM Arizona, Arizona Strip District), and Glen Canyon National Recreation Area (National Park Service).

2 Planning and NEPA

Status of the Resource Management Plan

Grand Staircase-Escalante National Monument is managed under a Monument Management Plan (MMP) adopted in 2000, and a series of four Management Framework Plans (MFP), adopted in the 1980s, which govern livestock grazing. The MMP replaced any previous decisions for resource management in the four MFPs, with the exception of livestock grazing. In 1999, the Escalante MFP was amended to reallocate 5,630 AUMs of forage to purposes other than livestock grazing. This amendment also created a forage reserve to be used during emergencies or for research purposes. The MMP has been amended twice; the 2011 Record of Decision (ROD) for the Tropic to Hatch 138 kV Transmission Line Project EIS in which a 300-foot wide by approximate 3-3/4-mile long swath of the Monument was changed from Primitive Zone to Passage Zone and from Visual Resource Management (VRM) Class II to Class III and the 2015 Record of Decision (ROD) for the Utah Greater Sage-Grouse Land Use Plan Amendment which provides management for the greater sage-grouse. This includes approximately 5,841 acres identified as a Priority Habitat Management Area and 23,662 acres identified as Opportunity Habitat within the Monument.

In the latter part of FY13, GSENM launched a planning effort to prepare a Livestock Grazing Monument Management Plan Amendment with an associated Environmental Impact Statement (EIS). BLM contracted Environmental Management and Planning Solutions Inc. (EMPSi) to write the EIS in September 2013. The Plan Amendment will make land use-level decisions associated with livestock grazing, including lands available or not available for livestock grazing, forage currently available on an area-wide basis for livestock grazing and available for anticipated future demands, and guidelines and criteria for managing the land to be as productive as feasible for livestock grazing through implementation of best management practices. The EIS will analyze the effects of all alternatives on the Monument's resources.

The Notice of Intent to initiate the planning effort was published in November, 2013. In FY 2014, Public Scoping & Socioeconomic Workshops were held, the Scoping Report was completed and Alternatives were formulated. During FY15, GSENM held public meetings to receive public comment on the Preliminary Draft Alternatives for the EIS. After a 45-day comment period, GSENM worked with environmental groups and Cooperating Agencies to develop the Draft Alternatives that will be analyzed in the EIS.

In addition, the Analysis of the Management Situation and the Socioeconomic Baseline Report was completed. In FY 2016, the preliminary alternatives were revised, the comment report completed and Cooperators helped develop the Draft Chapters 1-5 of the EIS. To date, GSENM has facilitated twenty-seven Cooperating Agency meetings, twelve forage team meetings, government-to-government consultation with the Kaibab Band of Paiute Indians and Hopi Tribe, 12 public scoping meetings and/or workshops, five newsletters, 15 fact sheets, and briefings with the Monument Advisory Committee, Kane County, Garfield County, the State of Utah and the public on the livestock grazing plan amendment and EIS.

Status of Activity Plans

Transportation Management Plan

The Transportation Management Plan (TMP) for GSENM was completed and included in the MMP (2000). Open routes have been signed in Kane County (approximately 2/3 of the land area) but not in Garfield County. Some administrative routes have been signed. Due to the legal status of RS2477 road claims and ongoing litigation, many routes that were not considered necessary or desirable have not been physically closed or rehabilitated. GSENM does not have a detailed route inventory. The Monument has identified this as a priority data need.

Special Recreation Management Area Plans

Six Special Recreation Management Areas (SRMA) were established in the MMP "where more intensive recreation management may be needed because the area will be a focal point for visitation or because recreational uses within the area need to be closely managed or limited to prevent conflicts with Monument resources." Activity plans for the six SRMAs have not been completed. The Monument is developing information for this effort through its Recreation Baseline Study, continued in FY 2016, through workshops and reports on visitor use in the Escalante Canyon Region in FY2015, through visitor satisfaction surveys conducted in FY2016 and through ongoing backcountry monitoring. These efforts are discussed elsewhere in this Report.

Status of Resource Management Plan Implementation Strategy

The MMP was the subject of an Implementation Review in 2010. Management actions taken to remedy issues and concerns noted in the review report include developing and carrying out an action plan; revising the GSENM Table of Organization;

filling critical positions where possible; renewing the GSENM commitment to a focus on science and science-based decision making; and working with interested public and applicable agencies and organizations to resolve issues regarding travel and transportation management, grazing administration, and protection of objects identified in the Monument's Proclamation.

Per the Implementation Review and resulting Action Plan, a Plan Implementation Strategy was initiated at GSENM. The Implementation Strategy identified numerous projects in the Monument's program areas. The Monument continues to identify priorities and implementing projects as staffing and funding allow.

Key National Environmental Policy Act Actions and/or Project Authorizations

GSENM completed eight categorical exclusions, and 26 Determinations of NEPA Adequacy in FY16. GSENM also completed four environmental assessments (EA). Two EAs analyzed campground improvement projects at Deer Creek Campground and at the Whitehouse campground. These projects included new vault toilets, tent pads, picnic tables, and improved parking spaces. A third EA was developed to authorize South Central Communications to install fiber optic line from their Buckskin Mountain substation to Page, AZ, within the Congressionally Designated Right-of-Way Corridor to improve Wi-Fi service to that city. The fourth EA analyzed filming in a Wilderness Study Area (WSA).

Interest in commercial film permits continues to grow at GSENM, with 5 film permits issued to support tourism marketing, event filming, and small production movies. As needed, GSENM park rangers work as film monitors and resource advisors during these productions.

Special Recreation Permits

In FY16, the number of Special Recreation Permit (SRP) holders rose from 101 to 108. More than 100 applications have been processed using the *Programmatic Environmental Assessment for Issuing Special Recreation Permits within GSENM* since it was signed in 2012, including 33 in FY16.

3 2016 Projects and Accomplishments

Fiscal year 2016 was quite successful for GSENM. In addition to celebrating the 20th Anniversary of the Monument with events, presentations, publications and a Science Forum, we improved rangeland health on many allotments, improved our developed campgrounds, improved facility security, provided authorizations for local businesses and utilities, advanced research on Bighorn Sheep, Hummingbirds, Soundscapes, Night Skies and Paleontology, and managed the steadily increasing visitation on the Monument. Monument management, staff and partners are proud to share highlights of these successes.

20th Anniversary Events

In celebration of GSENM's 20th Anniversary, GSENM in cooperation with Kanab Field Office, Grand Staircase Escalante Partners (GSENM), and Glen Canyon Natural History Association (GCNHA), sponsored 96 celebration events, presentations, field-trips, demonstrations, exhibit, commemorative items, publications, parade entries, press releases, and website stories. Included in these opportunities were birthday celebrations in each of our visitor centers held on September 18, 2016; and a special Respect & Protect National Public Land Days Event at Calf Creek Recreation Area. Overall, 2,948 people participated in the GSENM 20th Anniversary Special Events.

Participants of the special GSENM 20th Anniversary Respect & Protect National Public Lands Day Event at Lower Calf Creek Falls.

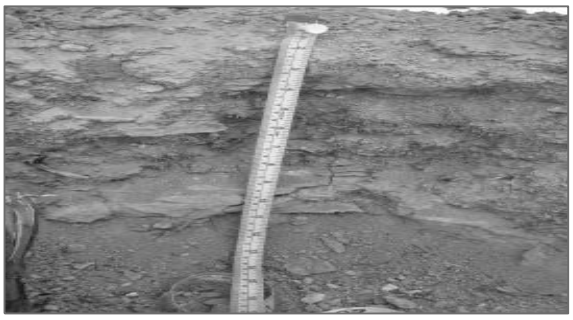
Science Symposium participants enjoy presentation on paleontology as part of the GSENM 20th Anniversary Science Symposium in Escalante.

Science Symposium: As part of its 20th Anniversary Celebration, GSENM sponsored a Science Symposium, located in Kanab and Escalante, Utah and featuring 26 lectures and fieldtrips given by prominent scientists from around the country. Drawing 309 participants, these educational presentations highlighted GSENM research, discoveries, and accomplishments. In addition, GSENM created a Science Report publication and DVD containing summaries of research conducted on GSENM over the last 10 years. A copy of the Science Report may be downloaded from the Grand Staircase Escalante Partners website at: www.gsenm.org.

Natural Resource Management Highlights

Rangeland Administration: During FY2016 the range program completed monitoring and data collection including utilization, long term trend or a combination of both at 75 locations across GSENM. Additionally, 250 livestock grazing compliance inspections were conducted throughout the 79 active GSENM-administered livestock grazing allotments. Information gathered from these activities is used to make both short and long-term decisions regarding the administration of GSENM rangelands.

AIM: Assessment Inventory and Monitoring (AIM) assessments recorded 24 AIM points across 15 allotments. Monument staff also conducted AIM on 22 sites within the Sage Grouse Priority Habitat Management Area (PHMA) located in the Kanab Field Office and GSENM. AIM points were identified in 10 selected vegetation strata using LANDFIRE Bio-physical Setting (BPS) vegetation data.



Left: AIM Soil Pit located on a Big Sage Brush LANDFIRE-BPS site. Right: AIM transect located on a Blackbrush LANDFIRE-BPS site.

Range Improvements: The range program works closely with grazing permittees, as well as the general public, to maintain infrastructure and provide for proper management of the livestock grazing program. Several projects completed in 2016 demonstrate the commitment by grazing permittees and the public to the sustainable management of livestock grazing on GSENM. This includes maintenance and repair of existing improvements such as livestock water developments, corrals and fences. Depending on the type of improvement, BLM and the grazing permittees may coordinate their efforts to accomplish these projects. This year maintenance on several important livestock water developments was completed including Cave spring, Calf Pasture Spring, Rock Seep, and Coombs Seep. Deteriorating metal tanks were replaced with low profile recycled/repurposed tire tanks that are highly durable and

have a lower profile, making water more accessible for young livestock and smaller species of wildlife.



Left: Coombs Seep tire tanks **Center: Cave Spring tire tanks** **Right: Calf Pasture tire tank**

Several fencing projects were also completed this year, including the Center Knoll spring protection fence and water development. This approximately 2 acre enclosure provides protection to sensitive riparian habitat while providing off site water for grazing livestock.

Left: Center Knoll Spring riparian area during protection fence construction. Right: Center Knoll Spring riparian area approximately 1.5 years later .

Also the Long Canyon stock driveway drift fence replaced a series of wire and brush stop gaps with a more functional and aesthetically pleasing structure that also aids ranchers in moving cattle more efficiently through the Long Canyon area of the Burr trail.

Long Canyon Stock Driveway Drift Fence

Weed Program: The GSENM has an active weed management program. Scotch Thistle, Knapweed, Whitetop, Russian Olive and Tamarisk are our biggest threats. Each year we try to focus on the known populations and inventory for any new ones. We are involved in the local Cooperative Weed Management Area and commit substantial time throughout the weed season assisting on these communal spray projects. As shown below we helped the Zion National Park spray Silver Nightshade which is an invasive plant that has become a threat to native plants in the area.

Left: Spraying Scotch Thistle at Nipple Lake.

Right: Canyon Country Weed Management Area spray day in Zion National Park.

Hummingbird and Bat Studies: The Monument continued long-term studies of bats and hummingbirds. During 2016 GSENM monitored bats in locations ranging from just over 4,000 feet elevation to 10,000 feet, which resulted in catching 12 out of the 18 known species from Utah. The Monument also hosted an acoustic bat

detection training session that was attended by bat enthusiasts and biologists from across the West.

In addition to noting species, weight, and key measurements on the hummingbirds, staff scientists study plant species utilized by these birds. This marked the seventh season for hummingbird monitoring and pollen collection, working with the Hummingbird Monitoring Network. Pollen swabs show the variety of plants visited by hummingbirds, including Utah penstemon and other native species critical for pollinators. Totals for the life of the project are 6,793 hummingbirds captured and 5,057 hummingbirds banded.

GSENM hummingbird and bat studies

Greater Sage-Grouse Habitat Assessment: Monument wildlife staff completed an ocular assessment of greater sage-grouse habitat on the Monument in the summer of 2016. Nearly 30,000 acres were assessed on foot and horseback to determine the current condition of our sage-grouse habitat. The Monument management plan was amended in September 2015 to include protections for sage-grouse and their habitat. In our area, encroachment of pinyon and Utah juniper trees is a major cause for concern as it leads to a decline in sage-grouse habitat condition.

Left: Phase I pinyon/juniper encroachment. Center: Tree encroachment and subsequent habitat decline led to accelerated erosion and gully formation. Right: Phase III tree encroachment - sagebrush understory is nearly completely absent

This assessment informs managers of the current condition of the habitat and helps managers make decisions about options are available to improve the habitat. Based on this assessment, the Monument is in the planning stages of future sage-grouse habitat restoration.

Wildlife Habitat Improvement and Monitoring Projects: Monument resource staff completed several wildlife water projects during 2016, leading to improved species distribution and alleviating impacts to key areas and critical natural waters. Projects included the installation of overflows and lids on three large water storage tanks. These tanks are often the only water source for miles, and wildlife is drawn to them, resulting in entrapment and mortality. The lids also help control water evaporation. Using donated funds from Sportsmen for Fish and Wildlife, materials were purchased to build water overflows and install lids at Buckskin, Five Mile, and Sink Hole water catchment sites. Overflows were constructed using 8" PVC pipe and the lids were installed using a new material called hexa-cover which consists of numerous floating discs that interlock to form a semi-solid lid that moves up and down in the tank with the level of the water.

Left: Seasonal range and fire staff assist in construction of overflows. Center: Hexa-cover discs being added to a large storage tank. Right: The floating discs are beginning to interlock to form a semi-solid lid. These lids reduce evaporation by 95% and reduce wildlife mortality.

Wildlife, range, and fire staff also joined forces to complete numerous water projects during 2016. Staff repaired major damage to several water catchment aprons. These aprons collect precipitation and flow it into large water tanks which store it for future use by wildlife and livestock. These catchments are essential for wildlife and livestock distribution and aid in maintaining a healthy rangeland. Staff replaced a water trough in the Coyote Wash area that receives substantial use by pronghorn. Approximately 4 miles of pipeline was replaced on West Clark Bench. This pipeline sustains water for three troughs which helps distribute livestock and wildlife. Water storage capacity was increased at the Timber Mountain catchment by adding an additional water storage

tank. The catchment apron and wildlife watering drinker at Timber Mountain were also repaired to a functional condition.

Left: Five Mile catchment apron before repair. Center: Five Mile apron after repair. Right: New tire trough replacing an old trough at Coyote Wash.

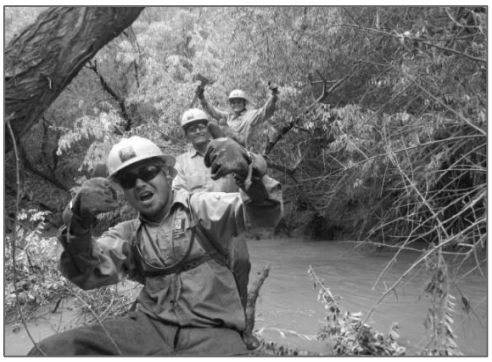
Left: Staff replacing valves on the West Clark pipeline. Center: Newly replaced wildlife drinker in foreground and water storage tank in background at Timber Mountain. Right: Rain water flowing into the new tank at Timber Mountain.

Monument wildlife staff completed additional inventory on reptiles and amphibians in 2016. Seventeen different reptile and amphibian species were recorded. Christmas bird counts were conducted in Escalante, Kanab and Boulder. One of the highlights of the counts was the appearance of flocks of Lewis' woodpeckers. GSENM wildlife staff also assisted the Utah Department of Wildlife Resources with midwinter bald eagle surveys, the annual bat blitz, peregrine surveys, Colorado cutthroat trout spawning and winter bird surveys.

Installation of a sediment collection structure at Old Corral Spring to control erosion and rebuild the system.

Riparian Restoration: There are many riparian systems throughout the GSENM all of which are managed to restore the functionality of a riparian system. For the past several years we have focused a lot of our time on one in particular, Old Corral Spring. This project is more than just a spring restoration project it's a Native American Native Plant Restoration Project and is an on-going Hands-on-the-Land Youth project.

Escalante River Watershed Restoration: The Escalante River Watershed Partnership (ERWP) is a collaboration among private and public stakeholders (see http://escalanteriverwatershedpartnership.org) to eradicate invasive woody species along one of the West's most iconic rivers. In seven years, close to 5,000 acres have been returned to open galleries of cottonwoods and willows, and 50 miles of native fish habitat have reconnected or improved in this Watershed. Crews removing Russian-olive and other woody invasive plants made great progress in 2016. A total of 78 out of 90 river miles of Escalante Main-stem plus tributaries have been cleared. This includes 233 acres of new treatments and 541 acres of re-treatment. The remaining 12 river miles, encompassing approximately 500 acres, should be very close to finishing by end of year 2018.



SWCC Ancestral Lands Program

Grand Staircase-Escalante Partners (GSEP) functions in an important role within the partnership by coordinating private funding and by providing guidance to the conservation corps supporting the project. GSEP obtained in grants from entities such as the Walton Family Foundation, Utah Partners for Conservation and Development (UT-DNR), as well as other private foundations and organizations. GSEP also provided two employees and worked with an Americorp intern to provide field support for each crew, as they did retreatment in both GSENM and Glen Canyon National Recreation Area. Three conservation corps participated in the this year's work, Utah Conservation Corps (16 youth) Canyon Country Youth Corp (16 youth), Southwest Conservation Corp (SWCC) - Ancestral Lands Program (5 youth). The Great Old Broads for Wilderness also provided a crew 12 people who gained experience in woody invasive removal in 2016.

Seeds of Success: Precipitation amount and timing during early FY2016 provided an excellent growing season for native plants. Seed from over 30 species of plants were gathered on the Monument for the Seeds of Success program and reclamation

efforts on the Monument. Through an agreement with the Chicago Botanic Garden, a crew of four researchers inventoried and collected locally-sourced seed from GSENM to be used on Monument restoration projects.

Left: C*armin gilia* Center: Crew from the Chicago Botanic Garden Right: Inventory and seed collection

Eightmile Salinity Control Project: Monument staff have engaged over the past three years to restore Eightmile Pond, a large salinity collection structure. Several similar structures across the monument collect highly saline soils and keep them from entering the Colorado River system. Phase 1 (2013) included site stabilization work, including spillway reconstruction, spillway restoration and spreader dike construction in preparation for major site work performed in FY14. Phase 2 (2014) began capacity restoration to the impoundment reservoir. Over 60,000 cubic yards of saline material was removed from the reservoir and impounded on site. Work in 2015 finalized the impoundment area and sediment retention; much of the pond was functioning to retain soils and water.

Left: Removal of saline sediment from the north reservoir. Center: Eightmile Reservoir filled to capacity after 2015 monsoonal moisture. Right: Eightmile Reservoir with impounded saline soil captured in the background.

In 2016 the Eight Mile Salinity Control Structure collected sediment and water during the summer 2015 monsoon rains. As of July 1, 2016 the pond was inundated with water so it was not possible to measure the depth of sediment that accumulated

during the previous year. However, based on a 40 year average of 0.4 feet of sediment retention per year the estimated salt reduction was approximately 28.7 tons in 2016.

Telegraph Flat and Finn Little Wash Salinity Control Structures: In 2016, GSENM identified five salinity control structures for repair and maintenance on Telegraph Flat, north of Hwy 89 at the southern end of GSENM. Telegraph Flat and Finn Little Salinity Control Structures were excavated during the week of June 27, 2016. Telegraph Flat 1 consists of two adjacent ponds that were full of sediment. Both reservoirs were filled with sediment and the dam was breached. Approximately 1,067 yd^3 of sediment was excavated from the two ponds and used to repair the breached dam and reinforce the dike structures. The last clean out date was unknown so the annual salinity load was not estimated.

Left: Telegraph Flat 1 before excavation.

Right: Telegraph Flat 1 during excavation.

Telegraph Flat 2, 3, and 4 consist of three consecutive gully plug salinity control structures installed in a gully that drains an intermittent stream to Clay Hole Wash. The Telegraph Flat 2 and 3 structures were functioning but full of sediment. The dam had been breached and blown out at the Telegraph Flat 4 structure and was in need of repair. In addition, the Telegraph Flat 4 retention pond was full of sediment. Telegraph Flat 2-4 were previously cleaned out in 2012 but have since filled in with sediment. Sediment was removed from the three ponds and used to reinforce the dam structures. The blown out dam at Telegraph 4 was also repaired. During the current cleaning we estimated that approximately 5,051 yd^3 of salt-laden sediment was removed from the three salinity control structures, constituting an average of 85 tons of salt retention per year over the past four years.

Left: Telegraph Flat 2 before excavation.

Right: Telegraph Flat 2 after maintenance.

Left: Telegraph Flat 3 before excavation.

Right: Telegraph Flat 3 after maintenance.

Left: Telegraph Flat 4 gully before repair.

Right: Telegraph Flat 4 after maintenance.

The Finn Little Salinity Control Structure is a gully plug located on Finn Little Wash. The structure has not been maintained for many years and the pond was filled with sediment and the dam was blown through. Sediment was cleaned from the pond and used to reinforce the dam structure and repair the blown out portion of the dam. During the current cleaning we estimated that approximately 3,129 yd^3 of salt-laden sediment was removed. The total salt retained prior to the dam being breached was approximately 209 tons, however we were not able to estimate the annual load since the last cleanout date is unknown.

Left: Finn Little gully before repair.

Right: Finn Little salinity control structure after repair.

FY2016 Wildfire Suppression Support: GSENM staff assisted in wildfire suppression as members of several Incident Management Teams and as single resources in a number of overhead and firefighting positions. Staff participated on 13 separate wildfire incidents, across 7 western states, involving approximately 434,000 acres.

Non-renewable Resource Management Highlights

Cultural Resource Inventory and Monitoring: Efforts in 2016 were again largely conducted in support of the ongoing Livestock Grazing Plan Amendment EIS and the upcoming allotment-specific EAs for permit renewal, as well as for Section 106 compliance on a variety of small projects. The allotment inventories and monitoring efforts were needed to characterize the archaeology of areas within GSENM that have not seen adequate archaeological efforts to date. Inventory in 2016 resulted in more than 1100 acres being covered and documentation of 35 previously unrecorded Historic Properties. Associated monitoring efforts resulted in updated information on 80 cultural resource sites. Inventory and monitoring for the above research was carried out largely by BLM archaeologists, while the GSENM Site Stewards program monitored sites as part of the overall cultural resource site monitoring program.

As part of the Respect and Protect campaign, GSENM initiated an ethnobotanical and cultural importance inventory of springs and riparian zones across GSENM. Federal Cultural Resources programs are primarily concerned with historic and prehistoric archaeological sites, or the material culture (artifacts and sites) left behind by previous inhabitants of an area. What is often overlooked is the landscape itself, and non-site-bearing parts of that landscape that were important to the inhabitants. One example of this is water sources such as springs. Going hand-in-hand with an inventory of springs is ethnobotany, or the study of how man uses plants, and how plants in return affect human cultures. In 2016 GSENM began a research project involving the importance of springs to Native American groups such as the Paiute, Hopi, and Navajo. A Northern Arizona University graduate student undertook an inventory project designed to identify the cultural importance of 30 different springs and riparian areas across GSENM, the presence or absence of culturally important plants, and the historical and ongoing Native American use of these locations. The Graduate student

identified dozens of important plant species at GSENM springs and riparian zones, including some that may represent intentional prehistoric propagations across GSENM and the greater southwest. The research will be included in a Master's thesis at NAU (in progress).

Visitor and Recreation Management Highlights

Visitor Center Management: Recreational visitation continued to increase throughout Southern Utah and especially along the All American Highway 12 as part of the Utah Office of Tourism Mighty Five Campaign which continues to draw visitors from all over the world. In addition to the Mighty Five Campaign, the "Road To Mighty" campaign which was designed to increase visitation on routes between parks. The National Park Service celebrated their 100-year anniversary which increased visitation throughout the region. Visitation at the Monument's four key visitor centers continued to reflect the same record visitation as experienced last year with the notable exception that visitation is substantially increasing during the shoulder season. Spring and fall months continue to show the greatest increases effectively expanding the busy season to 9 ½-10 months. Two park rangers were hired just in time for the spring season to fill vacancies at the Escalante Interagency Visitor Center.

GSENM Visitor Center 2016	Visitors
Big Water Visitor Center	33,097
Kanab Visitor Center	45,479
Cannonville Visitor Center	35,796
Escalante Visitor Center	76,179

Glen Canyon Natural History Association (GCNHA) operates the Monument retail sales program in four visitor centers. An annual Aid to Park budget was funded with approximately $24,000 granted to finish publishing the new paleontology book highlighting GSENM discoveries, which was released in fall of 2016. Six "Aid to Park" requests were also funded including Artist in Residence assistance, support for open houses and 20th Anniversary events, festivals in surrounding communities, annual Audubon Bird Count, staff training and dark skies astronomy equipment.

Recreation Visitation: Approximately 926,236 visitor contacts were made on GSENM including recreation sites and visitor centers. Visitation to GSENM continues to be collected and recorded in the BLM Recreation Management Information System (RMIS) via six different methods: foot and vehicle counters at key destinations, Visitor Center counts, fee envelope data, trailhead registers, and overnight permits in a backcountry data base. Record high visitor counts occurred at Lower Calf Creek Falls (36,437), Devil's Garden (27,802), Dry Fork Slot Canyons (27,647), Spencer Flat Road (15,275), Burr Trail (78,917), Grosvenor Arch (13,685), Paria Movie Set (19,099) and Toadstools Trailhead (18,765). The most popular trailheads experienced at least 3,000 more hikers than in 2015 and Dry Fork Slot Canyons received approximately 6,000 more hikers than the prior year.

Fee Program: The Monument administers a fee program for day-use and camping at Calf Creek Recreation Area and camping at Deer Creek Campground. Day-use visitation continues to rise at Calf Creek Recreation Area. Resultant parking issues require staff to direct traffic on busy weekends and holidays. Calf Creek Recreation Area Recreation Use Permits (RUP) for standard amenity day-use numbered 8,629 with 24,232 visitors purchasing permits totaling $40,543 in fee revenue ; Calf Creek Campground expanded amenity RUP permits numbered 2,077 serving more than 5983 campers totaling $29,780 in fee revenue; and Deer Creek Campground had 362 permits and received 760 campers totaling $3308. The recreation fee program deposited a total of $84,985 in a dedicated a recreation fee account in 2016.

In 2016, the Monument continued an agreement with Glen Canyon Natural History Association to sell *America the Beautiful* passes at Monument Visitor Centers. The NHA purchased 100 passes at the beginning of the spring season, adding $7,200 into a recreation fee account.

Backcountry Program: Backcountry Rangers responded to multiple incidents of vandalism of graffiti on cultural sites as well as canyon walls. One project was submitted and awarded grant funding for a new Respect and Protect campaign. The project is a series of community exhibits designed to reach visitors and locals who do not come into visitor centers with messages aimed at reducing vandalism at cultural sites.

In spring and summer the backcountry program had a focus on staff training in the inventory process for lands with wilderness characteristics. Two sessions of lands with wilderness characteristics inventory training were conducted on-site with participation of 12 interdisciplinary staff from GSENM, KFO and SGFO. A week long

training session conducted by the Utah State Office National Landscape Conservation System (NLCS) program lead, was conducted for the Upper Kanab Creek unit.

During Fiscal Year 2016, visitor center and backcountry ranger staff issued 2,602 backcountry permits for 205,847 visitor use days, and 1,497 car camping permits and 12,559 visitor use days for a total of 4,099 overnight backcountry and car camping permits and 218,406 visitor use days. Free overnight camping permits are mandatory.

Backcountry rangers conducted the majority of 1,044 backcountry patrols. Highlights include a total of 2,333 visitor contacts in remote areas of the Monument, more than 250 square feet of graffiti was removed, 1,210 feet of social trails were removed, 6,661 feet of vehicle tracks were removed and 622 campsites monitored with 98 fire pits removed and 66 cleaned. Human waste continues to plague day use hiking locations and more than 300 human waste incidents were hauled out of the canyons and plateaus. GSENM continued to install new trailhead signs as well as regulatory signs targeting resource, permittee and land owner issues.

Backcountry Monitoring Program: An assistance agreement was awarded to Penn State University. This project is intended to continue to inventory and monitor recreation impacts primarily in backcountry and dispersed areas throughout GSENM. This will include monitoring for both overnight camping and road-based impacts through a network of more than 700 dispersed campsites and 800 miles of roads as well as newly identified recreation nodes in backcountry areas. Monitoring will focus on dispersed recreation impacts at newly identified sites associated with wilderness therapy programs permitted to operate in the backcountry on the south side of the Monument. This project is based on a planning approach entitled Limits of Acceptable Change which assumes that the number and extent of physical human impacts on any recreation site are useful indicators. A variety of indicators were developed historically to measure physical impacts. The recipient will continue to monitor using these existing indicators and be given access to build on existing data compiled over a 12 year period, as well as develop and implement new monitoring protocols based on indicators and thresholds to address growing day-use visitation impacts for subsequent years of the project.

Escalante Interagency Interpretive Workshop: An interagency team comprised of 15 recreation staff, mid-level and Monument managers from the Dixie National Forest, Glen Canyon National Recreation Area and BLM GSENM staff was facilitated in Escalante during early January 2016. This day-long workshop was designed to review record visitation in 2015 and discuss priority needs and next steps for serving visitors

in the Escalante Interagency Visitor Center. A common vision was articulated by the group which identified the top areas for funding emphasis to assist staff. An interagency funding mechanism was established through a Service First agreement and $55,000 was targeted from BLM, USFS and the NPS. Monument staff established the agreement and wrote the Scope of Work and Technical Requirements for Interpretive Planning, Graphic Design, Writing, Art/Photos and Fabrication for Exterior Interpretive Exhibits and Audio Media. The contract was written awarded in September of 2016.

2016 BLM Visitor Satisfaction Survey: Calf Creek Recreation Area was the site of a BLM Utah Visitor Satisfaction Survey conducted on-site by an intern from the Southern Utah University Intergovernmental Internship Cooperative (IIC) program who was hired with recreation fee dollars. The intern administered approximately 300 random surveys over the course of two months in the summer, contacting 1286 visitors at the Calf Creek picnic and parking area. The survey was developed to measure the site's performance related to *BLM GPRA Goal 3.1, Provide for a quality recreation experience, including access and enjoyment of natural and cultural resources on DOI managed and partnered lands and waters.* Results revealed that the proportion of site visitors satisfied overall with visitor information, facilities, management, interpretation/education, staff services and programs exceeded the GPRA Goal at 98%. Other highlights found 90% of all respondents felt the fee was about right and respondents also indicated a high level of cleanliness for the site.

Recreation Experience Baseline Study: Colorado Mesa University's Natural Resource Center and GSENM used base funding (1711) and Federal Lands Recreation Enhancement Act (FLREA) fees to support the fourth phase of a multi-year study aimed at helping the BLM better respond to the public's desires and expectations for how recreation on the Monument is managed. Phase 4 studied the areas in the northern and eastern portions of the Monument - areas accessed by Scenic Byway 12 and Burr Trail Road. Thirteen focus groups in four communities occurred in March, August, and October 2016. Four webinar style focus groups occurred in July. There were a total of 100 participants in this phase of the study. The results of Phases 1, 2, and 3 were presented by Dr. Tim Casey at the GSENM 20th Anniversary Science Forum in August. Phase 5 will synthesize the data collected in the four data collection phases.

Respect and Protect Community Exhibits: Support from the Utah State Office (UTSO) provided funding for an interpretive project aimed at protecting cultural resources with specific focus on an anti-graffiti and anti-vandalism campaign.

Monument staff are working with the design firm, Blueraven-Creative, to develop sign panels and messaging. The design process will continue into 2017 and exhibits will be installed in a variety of community and business locations surrounding the Monument to target a public audience.

SUU Agreement for Acoustic Baseline: The Department of Psychology at Southern Utah University (SUU) conducted a final phase of baseline acoustic monitoring in 2016 in order to continue to identify current soundscape conditions and develop a better understanding of how natural sound and noise affect visitor experience and monument resources. Due to the size of the Monument and the distance from major urban areas, GSENM is suspected to be one of the quietest areas in the nation Due to the size of GSENM, additional acoustic monitoring data was needed to produce a more robust understanding of current soundscape conditions based on vegetation type, terrain and visitor use patterns. This project continued the work from the first two phases of the acoustic monitoring program of research. The final phase, which continues into the fall of 2017, will provide a complete representation of soundscape conditions in remote and heavily visited locations, including Devils Garden, Wolverine Canyon, No Man's Mesa, and Fifty Mile Mountain. More sensitive equipment was deployed at Dry Fork slot canyons, one of the quietest areas discovered during Phase I and II of this project in an effort to determine if this site is truly the quietest recorded in the US. Results from this research will continue to inform the future protection and management of natural soundscapes as a previously unknown scientific resource of the Monument. Students in the project have also started work on a listening library of sounds recorded as part of the project.

Night sky over Escalante Canyons

Dark Skies Research: In the spring of 2016, a research team from Weber State University and the International Dark Sky Association operating under a Monument Science permit collected baseline night sky quality measurements using hand-held sky quality meters that were calibrated with satellite images at 12 different locations within GSENM. Analysis of the results indicates that not only is the Monument dark, it may be the darkest place in the lower 48 states. The research team approached the Monument about being recognized as a Dark Sky Sanctuary, a new recognition status that is suggested for places like GSENM as some

of the most remote and darkest places in the US. A working team was formed consisting of GSENM staff as well as two BLM science and resource staff at the Grand Canyon-Parashant National Monument to explore the possibility of pursuing this recognition. In the summer, after dialogue with BLM WO staff, a communication plan for internal and external audiences was developed. It is anticipated that the draft proposal will be written in the winter of 2017 for review.

Paria Team: The Paria Team (staff from Vermillion Cliffs National Monument, Kanab Field Office, and GSENM) met every other month in 2016 to discuss issues associated with the Business Plan for managing North and South Coyote Buttes (The Wave) and the Paria Canyon-Vermillion Cliffs Wilderness. GSENM continued to host the daily walk-in lottery for the Wave at the Kanab Visitor Center with more than 49,000 visitors contacted and oriented to recreation opportunities on GSENM, Vermillion Cliffs and the KFO.

Education, Outreach, and Interpretation

Youth Employment Program: In partnership with Southern Utah University's Intergovernmental Internship Cooperative, Great Basin Institute, and the Escalante River Watershed Partnership, GSENM sponsored 154 youth internships and CORPS crews who worked on a wide variety of agency programs and projects including Assessment, Inventory, and Monitoring (AIM); Escalante River Watershed Project; Sage Grouse Habitat Restoration; Range Management; Native Plant Restoration; Recreation; Facility Management; Wildlife Assessment and Monitoring; and Paleontology.

Administered through our partner organizations, these BLM mentored employment opportunities promote professionalism in land stewardship and create opportunities to learn about, contribute to, and benefit from land management and resource conservation. In fiscal year 2016, youth provided 28,819 hours of service to the GSENM.

In continuation of the Title I Native American, Underserved, & Rural Disadvantaged Youth Engagement, Education, & Employment Program, interns provided by Southern Utah University IIC disseminated federal career recruitment information for diversity students, created by program sponsored Native American interns in 2015.

Paiute Youth Conservation Corps (YCC) crew working on experimental planting bed as part of on-going Native Plant Restoration

Native Plant Restoration Project: GSENM continued the Native Plant Restoration Project at Old Corral Spring in partnership with Grand Staircase Escalante Partners (GSEP), Glen Canyon Natural History Association, Youth Conservation Corps, Kaibab Paiute Band of Indians (KPBI), Paiute Tribe of Utah (PTU), and Southern Utah University Intergovernmental Internship Cooperative (IIC). In support of the program, IIC applied for and received a grant from the National Fish and Wildlife Foundation for Riparian Restoration in 2016 and 2017 at the Old Corral Springs test site.

The project is part of the Native American, Underserved, & Title I Youth Engagement, Education, & Employment Program. This STEM-based service learning project engages Native American and other Title I underserved youth in researching, restoring, and monitoring native plants within the BLM GSENM and Kanab Field Office (KFO).

Overseen by GSENM and KFO staff, GSENM sponsored 5 Youth Conservation Corps participants providing 400 hours of service. The YCC crew repaired flood damage to the exclosure fence at the Old Corral Spring test site, constructed two erosion control structures, cleaned out brush from inside the exclosure fence, prepared seedbeds for experimental plantings in 2017, and monitored native plant plantings from 2015. In addition, to encourage tribal youth to consider careers in natural resource management or in other science base fields, YCC members participated in GSENM's 20th Anniversary Science Symposium, attending presentations on archaeology, botany, and biology.

GSENM Paleontologist Alan Titus guided Kanab Elementary 4th grade students through classroom fossil identification activities

Frontier Science School: In cooperation with GSENM, KFO, and IIC, Grand Staircase Escalante Partners (GSEP) coordinated the pilot educational program called Frontier Science School and companion website: http://www.frontierscienceschool.org/.

This program provides regional educators (K-12) opportunities to collaborate with agency staff in the development of Science, Technology, Engineering, and Math (STEM) and Play, Learn, Serve, and Work (PLSW) based natural and cultural resource related hands-on

learning activities disseminated via classroom visits, school assembly presentations, field excursions, summer camps, and/or sponsored programs (i.e. 4H, Future Farmers, Girls Scouts, Boy Scouts, Native American youth camps, etc.).

GSENM provided educational events for 2,529 regional youth (including 1719 fourth graders as part of the Every-Kid-in-Park program). In working with educators in the development of lesson plans, the BLM insures that activities meet educator expectations and needs, and Utah and Arizona curriculum standards. At the same time, this collaboration allows GSEP and BLM to build mutually beneficial relationships with educators and their students grounded within a solid foundation of public land stewardship. As a result, BLM is better able to communicate and recruit participants for progressively more engaging land management opportunities to a wider and more receptive audience.

Students participate in an Every-Kid-in-Park information scavenger hunt at the GSENM Kanab Visitor Center

Kwiyamuntsi and Kaibab Paiute Youth Camp: In cooperation with the Kanab Field Office, National Park Service, United States Forest Service, Grand Staircase Escalante Partners, and Glen Canyon Natural History Association (GCNHA), GSENM co-sponsored Camp Kwiyamuntsi Event and participated in the Kaibab Paiute Camp for regional Paiute Youth. GSENM staff gave 10 formal presentations to 36 participants.

Junior Ranger Program: The Junior Ranger Program targets children six through twelve years old, and provides parents and children a fun and educational way to enhance their experience on public lands. Discovery Backpacks contain equipment, supplies, and information on how to perform rudimentary experiments and identify specimens using scientific methodology. Parents may check out and return a backpack to any of the four GSENM visitor centers without charge. For those children not able to take advantage of the Discovery Backpacks, a Junior Scientist Booklet is available at visitor centers free of charge. The booklet offers children fun activities, highlighting visitor center interpretive exhibits and the scientific process. GSENM issued 1000 badges to youth who completed the activity guide for the Junior (Scientist) Explorer program.

Artist-in-Residence Workshop participants show off artwork in Escalante, Utah,

Artist-in-Residence (AiR) Program: The purpose of the GSENM Artist-in-Residence (AiR) Program is to promote awareness of the exceptional natural and cultural treasures preserved and protected by GSENM - part of our National Conservation Lands - through the celebration of art. By bringing professional artists into the GSENM landscapes for a determined length of time to create works that inspire and promote stewardship of public lands is truly "Taking Public Lands to Heart."

In 2016, GSENM and our local community partner organizations offered four artist-in-residence opportunities in Music, Writing, Photography, and Graphic Art during two community events. One was the Artist-in-Residence in May hosted in Kanab, Utah, in conjunction with the annual Amazing Earthfest community event. The second was the Artist-in-Residence Plein Air held in September and hosted in Escalante, Utah, in conjunction with the Escalante Canyons Art Festival annual community event. As part of the program, GSENM provided 27 presentations, activities, website stories, and a booth at a convention in support of the program drawing 1,293 participants. In addition, AiR participants combined their unique musical compositions, exceptional photographic perspectives and thought provoking written insights into an extraordinary DVD production for public enjoyment.

Interpretive Events: Drawing 36,067 participants, BLM staff or partner organizations, Grand Staircase Escalante Partners or Glen Canyon Natural History Association, provided 2,287 visitor center or community based interpretive opportunities, including: showings of GSENM's Traces in Time DVD; ranger talks; Walks & Talks Presentations; offsite guided fieldtrips; booths at community events such as the Audubon Xmas Bird Count Event Balloons & Tunes Festival, Shamrocks & Red Rocks Festival, Earth Day Festival, Amazing Earthfest, Escalante Art Fair, Bryce Canyon NP Geology Festival, Western Legends, National Public Lands Day, Big Water Dinosaur Festival; presentations at science or resource related conferences or professional organizations; and news releases or radio interviews.

Interpretive Media: In fiscal year 2016, GSENM updated two interpretive and visitor service publications. GSENM printed 55,000 copies of the Visitor Information Brochure and 35,000 copies of the Calf Creek Guide.

Featuring a five-foot reconstructed *Deinosuchus hatcheri* skull, GSENM loaned the Department of Interior one of their Traveling Exhibits for display at the Main Interior

Traveling Exhibits (TE): The Paleontological Traveling Exhibit Program was devised to help generate public appreciation and participation in GSENM's paleontology program. The TE program provides opportunities for an estimated 12,000 or more people a year to see real fossils and related reconstructed specimens of dinosaurs, excavated in GSENM, in public forums that are more convenient and locally accessible than distant curator museums in Salt Lake City or other urban areas. Exhibits are self-contained and include interpretive panels and informational hand-outs. GSENM, Kanab Field Office, and Grand Staircase Escalante Partners featured traveling exhibits at several regional school assemblies or in-class presentations, public outreach events, visitor centers, and public venues, and school program. In addition, TEs were loaned to Kane County for exhibition at their administrative and Travel Council offices in Kanab, Utah; the John Wesley Powell Museum in Page, Arizona. One Monument exhibit was in on a long term loan to the BLM Washington Office and is displayed prominently at BLM offices at Main Interior.

Audubon Society Christmas Bird Count (CBC): A Hands on the Land/Take it Outside event, GSENM co-sponsored the CBC with the BLM Kanab Field Office (KFO) and in partnership with the Audubon Society, Bryce Canyon NP, Glen Canyon NRA, Grand Staircase Escalante Partners, Glen Canyon Natural History Association, Dixie/Arizona Strip interpretive Association, Bryce Canyon Natural History Association, and Kane, Garfield, Page, and Fredonia Schools. At area schools, GSENM and KFO staff set up bird feeders, and distributed bird identification materials. In addition, the GSENM Biologist provided two in-class presentations to 80 students and fieldtrip for 30 students and teachers. Over 1500 students from around the region participated in the CBC event, identifying and collecting bird and migration data.

BLM-GSENM Meets with University of Georgia Interdisciplinary Field Program: On July 1, 2016, nineteen University of Georgia undergraduate students along with several instructors met with a Monument staff member to learn about the BLM, National Conservation Lands, and the history of the GSENM as part of the universities' Interdisciplinary Field Program (IFP). The IFP is an eight-week field-based program that takes university students across the Western U.S teaching them about North American landscapes and environments. The group visited over 20 national parks and monuments during their trip. Students participating in the course come from a variety of majors, including: Anthropology, Art-Ceramics, Business, Ecology,

English, Environmental Chemistry, Environmental Economics, Environmental Engineering, Health Promotion, Geology, Journalism, Landscape Architecture, Mass Media Arts, Music, Natural Resources and Tourism, Physical Education, Social Work, and Theater. The students visited the GSENM to learn about the geology, history, and ecology of the area.

Cultural Resource Educational and Interpretive Presentations: Public education and interpretation have always been considered important parts of the overall GSENM Cultural Resources program. 2016 was considered another very successful year in this regard, with presenting or contributing to presentations at 37 different events and opportunities. These included a variety of both field and non-field presentations to a wide variety of attendees, from grade school Native Americans to professional archaeologists. Several events deserve particular merit:

GSENM participated in the first involved filming of the GSENM archaeologist for ARTE TV (roughly a French/German equivalent American public TV), featuring archaeology along Highway 12. GSENM contacted 898 people directly through the 2016 presentation of this film, and it is unknown how many thousands more will be exposed (and educated!) in Europe as a result of this project. Then, in the first week of August, GSENM held its third Learning from the Land Science Symposium. These symposia are put on by GSENM every ten years in an effort to showcase the wide variety of scientific investigations and projects happening at GSENM, including sections for paleontology, geology, biology, sociology, and a wide variety of other disciplines. Papers in the Archaeology/History block included research presentations by the GSENM Archaeologist as well as two seasonal cultural resource staff, recent graduate research regarding GSENM pollen core analysis, and research by the University of Utah into prehistoric use and distribution of a wild, local species of potato. It was a very successful symposium, and made public the stunning amount of research ongoing at GSENM. Unrelated to the Science Symposium but very strong along the lines of GSENM Cultural Resource research is the publication of The Formative Chronology of GSENM. This publication (Utah Cultural Resource Series No. 28 / Grand Staircase-Escalante National Monument Special Publication No. 4) was authored by retired GSENM Archaeologist Douglas McFadden, and represents the summation of more than 20 years of archaeological research in the northeastern edge of the Virgin Anasazi area. This will prove to be the “go to” reference for archaeological investigators in the GSENM and Arizona Strip area for decades to come.

Paleontological Resource Educational and Interpretive Presentations: Highlights of the first quarter include leading a Kanab High School field trip into the

Monument, and the Monument Paleontologist giving a lecture series on the evolution of birds for the Audubon Christmas bird count. Also, special temporary exhibits were put up and lab tours offered for National Fossil Day (October 15th). Through much of the spring, Christa Sadler's beautiful full color book on the fossil resources of the southern Utah (with a focus on GSENM), was finalized for printing. Although officially in print in FY16, the book, titled "Where Dinosaurs Roamed: Lost Worlds of Utah's Grand Staircase", did not reach the shelves of Glen Canyon NHA shops until late October.

In July, the paleontology program ran a portion of the Utah State University's Master Naturalist course. Later in the summer the program also supported the Western Legends, Escalante Arts Fair, and Big Water Dinosaur Festivals with booth staffing and exhibits. Paleontology was also a major theme for the 20th anniversary celebration (Learning from the Land Forum), which featured a number of excellent presentations on recent research as well as a field trip to the Rainbows and Unicorns tyrannosaur bonebed site in the northern Kaiparowits Plateau.

Near the end of the year a collaborative effort with the Denver Museum of Nature and Science led to a live broadcast from the field to thousands of school children across the US. BLM's new cultural and paleontological "Respect and Protect" theme was featured, as well as the museum's latest excavations and research. The event was interactive with the students and was a great success. Also near the end of the fiscal year, the contract for completely new exhibits in the Big Water Visitor Center was awarded and installation began in mid-September. The new exhibit outlines the evolution of the one of the most majestic and awe inspiring fossil animals found in GSENM, the rhinoceros-like ceratopsids. Six replica skulls and accompanying interpretive panels and artwork tell the unique story of these animals in the southwestern US, much of which has only come to be known from recent work done in the Kaiparowits Plateau.

In addition to these special events, the paleontology program conducted 56 tours, radio interviews, and lectures to thousands of members of the public. Also, rangers at the Big Water Visitor Center continue to give annually dozens of presentations on paleontology to hundreds of members of the public in organized tour groups.

Partnerships

The Monument's extensive research, outreach, and educational programs were supported by more than 50 active partnerships in FY16. These included the Monument's non-profit friends groups, Grand Staircase Escalante Partners and Glen Canyon Natural History Association (GCNHA) as well as private foundations, academic institutions and individual researchers, regional and statewide partnerships, and interagency partnerships. In addition to stewardship and restoration-focused initiatives, GSENM also maintains nearly 4 dozen active research programs with academic institutions and individuals. These programs are identified individually in Section 4 of this report.

Volunteers

Grand Staircase Escalante National Monument sponsored 103 volunteers (including 8 youth volunteers) and 93 hosted workers for a total of 196 in FY16. These volunteers and Hosted Workers preformed a total of 42,628 duty hours to our programs, with a monetary value of $983,428. Volunteers were recruited and managed through several Monument programs, including our Site Steward Heritage stewardship initiative, our watershed restoration work, and the paleontology laboratory. Several organized volunteer groups donated time and effort to the Monument in FY16, including Great Old Broads for Wilderness, Wilderness Volunteers, Utah Backcountry Volunteers, and the Grand Staircase Escalante Partners. The Escalante River Watershed partnership (ERWP) also continues in collaboration with Grand Staircase Escalante Partners, coordinating our largest workgroups on the Monument.

In light of our 20 year anniversary, we held an appreciation picnic for all Volunteers providing 250 hours of service or more. We had approximately 50 attendees from near and far. Support was provided by both nonprofit partners: Glen Canyon Natural History Association and Grand Staircase Escalante Partners. All volunteers received recognition by certificate for achieving over 250 hours of volunteer work on behalf of the monument; of those, 7 volunteers received special awards (Brazos walking sticks with GSENM medallions) for service above & beyond.

Land (or Interests in Land) Acquisitions

GSENM initiated no acquisitions in 2016.

4 Science

Moving Bureau-wide Science Initiatives Forward

GSENM is surrounded by other large tracts of federal and state lands, and shares borders with three National Park Service units, two state parks, and a National Forest. Together, these units include over 4 million acres of lands managed for conservation. In FY16, GSENM worked with Great Basin Institute project leaders and field crews to establish an additional 24 Assessment, Inventory, and Monitoring (AIM) stations on the Monument and worked with the National Operations Center and with the Utah State Office, and Utah State University scientists to begin work on a step-down project of the Colorado Plateau Rapid Ecoregional Assessment (REA) to the Escalante River watershed and develop a toolkit for Monument planning purposes.

Current Science Projects

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds
GSENM Archaeological and Historical Assessment Assistance Agreement L16AS00140 L16AC00252	The purpose of this project is to research and produce a comprehensive grazing and ranching history for the GSENM area (Kane and Garfield Counties) as well as produce interpretive information for the old Paria townsite.	grazing, ranching, archaeology	Jerry Spangler, Colorado Plateau Archaeological Alliance	Reports in progress	$45,500
Archaeological Inventory and Monitoring (part of Assistance Agreement L11AC20222: NLCS GSENM Archaeological Assessment)	The purpose of this project is to gather baseline data on the Archaeological sites and distributions within GSENM, as well as monitoring the conditions of these sites.	archaeology, history, monitoring	Jerry Spangler, Colorado Plateau Archaeological Alliance	Report awaiting final BLM review	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Meadow Canyon Archaeological Inventory (part of Assistance Agreement L11AC20222: NLCS GSENM Archaeological Assessment Project)	The purpose of this inventory is to characterize the archaeology in the vicinity of the Meadow Canyon Pollen Core so that data from the core can be used in conjunction with historic and prehistoric use of the landscape and climate change over time.	archaeology, paleoenviro-nments, palynology, botany, climate change	Jerry Spangler, Colorado Plateau Archaeological Alliance	Final report awaiting BLM review (NOTE: funds for this project lumped with those for "Archaeological Inventory and Monitoring"--same Assistance Agreement)Analysis in progress	$0
Lake Pasture Archaeological Inventory (part of Assistance Agreement L11AC20222: NLCS GSENM Archaeological Assessment Project)	The purpose of this inventory is to characterize the archaeology in the vicinity of the Meadow Canyon Pollen Core so that data from the core can be used in conjunction with historic and prehistoric use of the landscape.	archaeology, paleoenviro-nments, palynology, botany, climate change	Jerry Spangler, Colorado Plateau Archaeological Alliance	Final report awaiting BLM review. (NOTE: funds for this project are combined with those for "Archaeological Inventory and Monitoring"--same Assistance Agreement)	$0
GSENM Pollen Core and Ethnobotanical Analysis Assistance Agreement L16AS00143 L16AC00252	The purpose of this inventory is to further analyze the pollen cores collected and initially analyzed under agreement L11AC20222; this information can be used in conjunction with historic and prehistoric use of the landscape and climate change over time.	archaeology, paleoenviro-nments, palynology, botany, climate change	Dr. Scott Anderson, Northern Arizona University	Report in progress	$30,000
Identification and collection of Penstemon taxa native to Utah for diversification, documentation, and genotyping studies	Purpose: To produce a Penstemon field guide for Utah, and to gain a better understanding of the genetic diversity of Penstemon within Utah.	botany	Mikel R. Stevens, Brigham Young University Plant and Wildlife Sciences Department	Research in progress; one public presentation at GSENM	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Baseline Inventory of Bryophytes of GSENM (Assistance Agreement L14AC00275)	This proposal will examine questions/issues dealing with (1) what species of bryophytes occur within the GSENM?, (2) where are the “hot spots” of bryophyte diversity within the GSENM?, and (3) characterizing rare, regionally disjunct, or new species to science within the GSENM.	botany, bryophyte, inventory, taxonomy, diversity	Lloyd Stark, University of Nevada-Las Vegas	Project initiated in FY14	$38,000
Scent-mediated diversification of evening primrose (Onagraceae) flowers and moths across western North America	This project will examine the role of floral scent in the diversification of a model plant-pollinator-enemy system in the western North American evening primroses (Onagraceae), focusing on how chemically-mediated interactions between flowering plants, pollinators, and enemies affect diversification at population, species, and higher levels.	botany, ecology, plant ecology, pollination	Dr. Krissa Skogen, Jeremie Fant, Rick Overson, Tania Jogesh, Matt Rhodes, Evan Hilpman: Chicago Botanic Garden	Research in progress; annual report submitted	$0
Special Status Species: Threatened and endangered species monitoring (L11AC20161)	Annual monitoring and surveying of three federally listed plant species. Ute Ladies'-tresses, Jones' Cycladenia, and Kodachrome bladderpod. Monitoring is used to detect trend and surveys occur to find unknown population sites	botany, endangered species	Amber Hughes, GSENM	Research in progress	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Seeds of Success	Seeds of Success (SOS) was established in 2001 by the Bureau of Land Management (BLM) in partnership with the Royal Botanic Gardens, Kew Millennium Seed Bank (MSB) to collect, conserve, and develop native plant materials for stabilizing, rehabilitating and restoring lands in the United States. The initial partnership between BLM and MSB quickly grew to include many additional partners, such as botanic gardens, arboreta, zoos, and municipalities. These SOS teams share a common protocol and coordinate seed collecting and species targeting efforts. SOS is a vital part of the Native Plant Materials Development Program.	botany, native plants, restoration	Amber Hughes, GSENM	Research in progress	$0
Phylogeography and evolution of *Mentzelia cronquistii* (Loasaceae) and the *Mentzelia marginata* complex	This project will explore how geographic and topographic complexity shape migration routes, gene flow, and plant speciation on the Colorado Plateau through a study of the geographic patterning of genetic diversity in the *Mentzelia marginata* complex.	botany, plant speciation	Dr. Larry Hufford and Joseph Grissom, Washington State University; Wendy Hodgson, Desert Botanical Garden, Phoenix, AZ	Research in progress	$0
Learning from native 'winners'	Purpose: to identify native species and populations that can perform well in degraded sites and potentially facilitate succession to diverse native communities.	botany, restoration	Andrea Kramer et al, Chicago Botanic Garden	Research in progress; annual report submitted	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
BLM Utah rare plant research and ex-situ conservation of plant species	The purpose for this project is to conduct ex-situ conservation through seed collection and long-term storage of threatened, endangered, candidate, BLM sensitive and native species in southwestern and other areas of Utah. Seed collected will be stored as long-term ex-situ onservation germ plasm at both Red Butte Garden and CGRP in Fort Collins. If seed numbers allow, a small portion will be used to conduct non- destructive seed viability and propagation studies.	botany, seed conservation	Rita Reisor, Red Butte Garden, University of Utah	Research in progress	$0
USDA Forest Service National Forest Inventory and Analysis program	Purpose: To conduct forest inventory at selected locations throughout the Monument to determine: status and trends in forest area and location; species, size, and health of trees; total tree growth, mortality, and removals by harvest; wood production and utilization rates by various products; and forest land ownership.	ecology, forestry, forest ecology, forest inventory	Maryfaith Snyder, USDA Forest Service Rocky Mountain Research Station, Interior West Forest Inventory and Analysis	Research in Progress.	$0
Paleoecology study of the GSENM	Assistance Agreement L11AC20143	ecology, paleoecology, paleoenviro nment, cultural resources	Scott Anderson, Northern Arizona University and Ken Cole, USGS	Closed. Master Thesis (report) delivered in FY2016.	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
untitled	Purpose: To test the hypothesis that habitat near or at ecological potential will show significantly reduced impacts from the expected effects of climate change.	ecology, plant ecology, climate change	Jim Catlin, Wild Utah	Research in progress; annual report submitted.	$0
Restoration Studies (and dust collection study)	Determines what mechanisms of disturbance create the greatest opportunity for success in restoration processes. Dust collection study is designed to collect data on soil loss from disturbed sites.	ecology, restoration, soil, erosion	Raymond Brinkerhoff, GSENM; UPCD; Color Country District BLM; Utah Cooperative Extension Service; NRCS	Research in Progress.	$8500
Sandstone Weathering Profiles	The purpose of this project is to study weathering processes and their products in the Navajo Sandstone, and to compare them with those in Japan and related areas in Asia with different geologic and climate settings.	geochemistry, weathering	Hirokazu Yoshida, Nagoya University	Project initiated in FY14. No fieldwork in FY2016. Peer reviewed publication expected in FY2017.	$0
Geomorphology and geochronology of andesitic boulder deposits in the Escalante Canyons section of GSENM	This project will study the andesitic boulder deposits around the southern Boulder Mountain and Aquarius Plateau piedmont, including the effect that andesitic boulder gravels have on modern river incision rates.	geology	David Marchetti and Amy Ellwein, Western State Colorado University; Scott Hynek and Thure Cerling, University of Utah	Research in progress.	$0
Mass Extinction Recovery	This project will focus on the biotic recovery after the end-Permian mass extinction (252 Ma ago) in order to better understand patterns and processes of diversity dynamics during the Early Triassic	geology, geochemistry	Arnaud Brayard et al, Centre National de la Recherche Scientifique, France (National Center for the Scientific Research)	Research in progress; no field work in FY16.	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Iron Geochemistry in Sandstone Formations.	Purpose: To study various iron- oxide rich concretions using petrography and SEM, and to measure the orientation of more pipe-like concretions that define the flow direction and geochemical evolution of a paleoaquifer.	geology, geochemistry	David B. Loope, University of Nebraska Department of Geosciences	Research in progress.	$0
Early Laramide influenced sedimentary patterns along the East Kaibab Monocline.	The purpose of this project is to examine the geology of the East Kaibab Monocline, especially with respect to sag ponds.	geology, sedimentology	Dr. Ed Simpson, Kutztown University of Pennsylvania, Department of Physical Sciences and Dr. Mike Wizevich, Central Connecticut State University	Research ongoing. Two scientific publications in FY2016. Annual Report submitted.	$0
Upper Paleozoic and lower to middle Mesozoic eolian quartzarenites on the western Colorado Plateau Province	This project will study quartzarenites from upper Paleozoic and lower to middle Mesozoic lithostratigraphic units of mainly eolian origin on the western Colorado Plateau Province in southwestern Utah. Several specific eolian stratification types (wind-ripple, sandflow, and grainfall strata where preserved in the Lower Jurassic Navajo Sandstone, Middle Jurassic Page Sandstone, particularly the Thousand Pockets Tongue and Leche-e Memberand eolian beds in the Middle Jurassic Entrada Sandstone) will be sampled. Textural attributes will be compared with eolian calcarenites from the Bahamas.	geology, sedimentology	Dr. Mario Caputo, San Diego State University & California State Polytechnic University, Pomona	Research in Progress.	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
The Permian-Triassic boundary and the Early Triassic in Transcaucasian pelagic sections	This project will examine early Triassic microbialites to determine mode of deposition (abiotic, microbially-control, or microbially-induced), and to characterize the relationship between microbialite occurrence and oceanic conditions at deposition.	geology, sedimentology	Dieter Korn, Berlin Museum of Natural History	Project closed in FY2015	$0
NSF Earth Life Transitions (ELT) Project: Perturbation of the Marine Food Web and Extinction During the Oceanic Anoxic Event at the Cenomanian/Turo-nian Boundary	The purpose of this project is to test for evidence of ocean acidification during the OAE 2 event. This permit authorizes the team to drill a hole in the Tropic Shale to collect samples of unaltered bivalves, snails, and ammonites for analysis.	geology, sedimentology, paleobiology	Brad Sageman (Northwestern); Mark Leckie (UMass-Amherst); Tim Bralower, Mike Arthur, Matt Fantle, and Lee Kump (Pennsylvania State U); Mick Follows, Julio Sepulveda; (Massachusetts Institute of Technology)	Core was drilled summer of FY2014. Samples currently undergoing analysis.	$0
Correlation and Environments of the Cretaceous age Naturita Formation	This study is establishing detailed correlations between the Naturita in GSENM and outcrops elsewhere in the Colorado Plateau region.	Geology Stratigraphy.	Brad Sageman (Northwestern University).	New project for FY2016. Fieldwork conducted in FY2016.	$0
Regional correlation of the Triassic age Chinle Formation	This study is attempting to establish a detailed time based correlation of Late Triassic strata in the Circle Cliffs area with that of the	Geology, stratigraphy	Dr. Jeff Martz, University of Houston.	New project for FY2016. Research ongoing Fieldwork was conducted summer of FY2016.	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Soft Sediment Deformation and Injectites in the Jurassic Carmel Formation, Southern Utah: Implications for Reservoir Characterization, and Geomorphic Features on Mars	This study will examine a well-exposed example of numerous injectites/clastic pipes in the Jurassic Carmel Formation south of Big Water, Utah and to compare them to similar pipes along the White House Trailhead road, South of the Paria Contact Station. The objectives are to: characterize the sedimentology, mineralogy, and diagenesis of the pipes; map population clusters; measure size hierarchies; and examine spatial relationships of regional tectonics, faulting, and relation to paleoshorelines.	geology, sedimentology paleoshorelines	Dr. Marjorie Chan, University of Utah	Research In Progress; annual report submitted; Peer reviewed journal article published in FY2016.	$0
Isotopic Signatures of Carbonates in Kaiparowits Formation	This study seeks to characterize environmental parameters (temperature, hydrologic function) of 75 million year old Kaiparowits Formation.	Paleo environmental studies.	Dr. Celina Saurez, University of Arkansas.	Ongoing. Second season of fieldwork conducted in FY2016. Report submitted.	$0
Tar sands generation and migration study	This project is sampling tar sand deposits in the Circle Cliffs to understand the origins of such deposits at a regional scale.	Fluid hydrocarbon generation studies.	Jason Flaum, Exxon-Mobile Research Dept.	Ongoing. No fieldwork conducted in FY2016.	$0
EarthScope Program	Purpose: To install one GPS monument in GSENM as part of a network of 33 sites in the southwest to study the crustal motion and deformation of the Colorado Plateau and the transition zones with the northern and southern Basin and Range.	geology, seismology	Cornelius Kreemer, University of Nevada Reno Nevada Bureau of Mines and Geology	Permit expired in FY2014, but station is still installed and reporting data to network.	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Paleomagenti Survey of Late Cretaceous Strata Kaiparowits Plateau, Utah L16AC00160	Purpose: To refine the temporal characterization of late Cretaceous strata through magnetostratigraphic analysis and its correlation to the Global Geomagnetic Polarity Time Scale (GPTS) in order that the hundreds of fossil localities currently known can be accurately placed in time. Field collection of rock samples to analyze at the UC Berkeley Geochronology lab for remnant magnetism to determine polarity and age.	geology, stratigraphy, dating	L. Barry Albright III, University of North Florida Department of Physics	Research ongoing. Peer reviewed paper published FY2016. Funded for an additional 5 years.	$6,000
Facies analysis, correlation, and reservoir prediction in nonmarine shallow marine strata: Cretaceous Straight Cliffs Formation, Utah	Purpose: To document fluctuating marginal marine successions, explain facies variation in correlative nonmarine strata, and address the possible primary factors driving development of sequence and stratigraphic architecture (e.g., tectonic and eustatic controls).	geology, stratigraphy, deposition	Cari Johnson, University of Utah Department of Geology and Geophysics	Research in progress; annual report submitted; Four peer reviewed papers published; one dissertation finished and submitted.	$0
Stratigraphy, sedimentology and taphonomy of Upper Cretaceous strata in the Kaiparowits Basin	This project will resolve the temporal, taphonomic, paleogeographic, and paleoenvironmental framework of the Upper Cretaceous Kaiparowits, Wahweap, and Straight Cliffs formations by: 1) developing a chronostratigraphic record from volcanic ashes; 2) making paleoenvironmental interpretations from invertebrate and ichnological fossils; and 3) analyzing paleosols and associated fluvial and paludal sediments.	geology, stratigraphy, paleoenvironments	Dr. Eric Roberts, James Cook University, Queensland, Australia.	Research in progress	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Ground Water Study to Inventory and Map Water Wells in the Grand Staircase Escalante National Monument (L16PG00016)	The USGS, Utah Water Science Center, will complete an update of the water well inventory was done in 2000 - 2001. The area of coverage will be same as the previous inventory, to include the entire GSENM as well as the lands adjacent to the GSENM on the north side in the vicinity of the town of Boulder, and the lands on the west side of the monument in the vicinity of the town of Escalante. The inventory will include 1) review and completion of missing data elements in the existing inventory (where additional data is available), 2) updating the inventory data base with all new wells drilled since the last inventory, and 3) the inventory of wells will be mapped into GIS coverage, so that individual wells can be reviewed for relevant information, such as date drilled, total depth drilled, producing aquifer, producing yield, screened interval, etc. Approximately 12 data attributes will be selected to comprise the well data, and will be selected by mutual agreement with USGS and BLM.	hydrology, ecology	Bert Stolp, USGS Utah Water Science Center	Project ongoing.	$45,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
BLM Assessment, Inventory and Monitoring (AIM) Project (Assistance Agreement L13AC00126)	This project will collect data on land health for the Utah pilot implementation project of BLM's national Assessment, inventory and Monitoring (AIM) strategy. The study will follow a probabilistic (random, stratified) sampling design developed in conjunction with USDA ARS Jornada Experimental Range. Data will be collected in accordance with AIM standard methods.	land health	Jerry Keir, Great Basin Institute	Research in progress; annual report and datasets submitted	$80,000
Toward an integration of historical and contemporary data to inform assessment, monitoring, and decision-making on the Grand Staircase-Escalante National Monument (Assistance Agreement L13AC00249)	Purpose: to conduct a retrospective study of existing vegetation assessment and monitoring data and to compare the results of that study with anticipated results under the AIM strategy. This study will: a) evaluate the representativeness of existing GSENM vegetation monitoring data previously sampled using both probabilistic and non-probabilistic designs; b) summarize and compare methodologies used to collect these data in a rigorous analytical framework; and c) evaluate the potential for integration of these data into the stratified probabilistic design to be developed through the application of the AIM strategy for land health assessment on GSENM.	landscape ecology, land health, range assessment, range monitoring	Brett Dickson, Northern Arizona University	Research in progress; preliminary results submitted.	$0
Cretaceous microvertebrate diversity.	To sample mudstone facies to recover small terrestrial vertebrate fossils and assess overall diversity of different times and facies.	paleontology (vertebrate)	Dr. Jeff Eaton, Natural History Museum of Utah	Research in progress; annual report submitted	$6,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Cretaceous Paleobotanical Heritage Resource Inventory/Specimen Protection (L11AC20100)	Purpose: To inventory Cretaceous paleobotanical resources in the Kaiparowits Plateau region. Ground inventory for significant plant fossils using GPS technology, field notes, and photographs to document resource location/condition. Significant specimens are collected to preserve them. Collected specimens are stabilized and prepared for long term curation by volunteers at the DMNS.	paleobotany	Dr. Ian Miller, Denver Museum of Nature and Science.	Research in progress; annual report submitted.	$0
Kaiparowits Basin Project-Invertebrate Survey L12AC20541	Intensive sampling of freshwater mollusks in a variety of sedimentary facies should allow for characterization of ecological preferences of each species. This in turn will help refine paleoecological models for all Late Cretaceous fossil taxa.	paleontology (invertebrate), paleoenvironment	Dr. Lief Tapanila, Idaho State University	Research in Progress.	$0
Cretaceous marine vertebrate diversity.	Inventory of Tropic Shale outcrops mostly for marine reptiles, but also for fish and the rare dinosaur.	paleontology (vertebrate)	Dr. David Gillette, Museum of Northern Arizona, with Dr. Beck Schmeisser, Norbert College.	Research in Progress.	$0
Kaiparowits Basin Project (L14AC00302)	Quantification of fossil vertebrate diversity and ecological disparity of vertebrate taxa in Kaiparowits and Wahweap formations through inventory and collection and research on existing collections. Emphasis is on crocodilians and theropod dinosaurs, but all vertebrate groups will be assessed.	paleontology (vertebrate)	Dr. Joseph Sertich, Curator of Vertebrate Paleontology, Denver Museum of Nature and Science	Research in progress; annual report submitted. Abstract/poster presented at professional mtg.	$24,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Late Cretaceous Squamate Diversity	Collection and research on fossil squamates (lizards and snakes) of the Kaiparowits Plateau region.	paleontology (vertebrate)	Dr. Randall Nydam, Midwestern University.	Project closed in FY2016.	$0
Late Cretaceous Vertebrate Diversity-Kaiparowits Formation	Collection and research on vertebrate fossils from the Kaiparowits Fm. near Canaan Peak.	paleontology (vertebrate)	Drs. Don Lofgren and Andy Farke, Raymond Alf Museum.	One scientific publication in FY2016. Annual Report submitted.	$0
Cretaceous Vertebrate Heritage Resource Inventory/Specimen Protection (includes NMHU L12AC20378)	Purpose: To survey and research vertebrate paleontological resources from Late Cretaceous deposits within the Monument.	paleontology (vertebrate), paleontology (invertebrate), paleobotany, Paleoenviro-nment	Randall Irmis, Natural History Museum of Utah at the University of Utah	Research in progress; annual report submitted. Two peer reviewed papers submitted in FY2016. One MSc. Thesis submitted.	$52,000
Late Cretaceous Biodiversity GSENM region.	Inventory, collection, and research on late Cretaceous fossil ecosystems of the Grand Staircase and Kaiparowits Plateau areas.	paleontology (vertebrate, invertebrate, paleobotani-cal, ichnology).	Dr. Alan Titus, Monument Paleontologist, Grand Staircase-Escalante National Monument.	One additional scientific publication. Annual report submitted.	In-house
BLM-Utah State Office Monitoring	New long term trend monitoring designed to make data collection uniform across the state.	range management	BLM Utah State Office, Univ. of Arizona	Research in progress	$0
Visitor Capacity of the Dry Fork slot canyons and within the Calf Creek watershed and analysis of existing data (Interagency Agreement with Aldo Leopold Wilderness Research Institute (L14PG00241)	This research will rely primarily on existing data from two locations to determine visitor experience and resource conditions that are needed for future backcountry management related to day- use and implementation of a SRMA or SMA, workshops and report submitted in FY2015	wilderness study areas, visitor experience, visitor capacity, day-use, resource impacts	Dr. David Cole	Research began in spring 2015	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
GSENM-Recreation Experience Baseline Study (L12AC20566	This study is designed to facilitate social science research aimed at understanding recreation experiences at GSENM. Project uses focus groups, conducted in face-to-face sessions as well as via web-based sessions, to determine interests and expectations of recreationists, desired outcomes, setting characteristic preferences, sense of place, and tolerance for changes such as crowding and physical setting changes. Focus groups have been conducted with local residents, commercial guides, local officials, and members of the tourism support industries in the area. Data collection has been aided by audience polling technology and the BLM project lead has assisted in populating the focus groups, developing the scripts, and securing locations and times for the focus group sessions. Phase 1 was conducted in 2013 and studied the Hole in the Rock area; Phase 2 was conducted in 2014 and studied the Grand Staircase region.	recreation experience, visitor experience, sense of place, user preferences	Dr. Tim Casey, Colorado Mesa University	Research in progress; annual report submitted	$15,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Baseline Acoustic Monitoring at GSENM (assistance Agreement L14AC00078)	This agreement was initiated in 2014 to conduct baseline acoustic monitoring at GSENM to determine current soundscape conditions and develop a better understanding of how natural sound and noise affect visitor experience and monument resources.	recreation, acoustics, visitor experience	Britton Mace, Grant Corser, Larissa Reynolds, Shelly Ewen, Jennifer Anderson, Cassi Hoffmeister, Stuart Clements, Alex Vittum- Jones, Glenn Beacham and Kaitlin Potter: Southern Utah University, Dept. of Psychology	Research in progress; Three sets of monitoring equipment were loaned to GSENM in Sept 2014 by NPS. Training on deployment, data collection, extraction, data analysis and reporting was conducted by NPS Natural Sounds Office. Training attended by PI, 8 student research assistants and 8 GSENM staff. PI and research assistants check equipment every two weeks and download data once per month. Planning, site selection, and scoping were conducted with GSENM staff, the PI, research assistants, and NPS personnel. Equipment deployed along Calf Creek and Deer Creek Trails and in the Dry Fork Canyons area. Data sets consisting of 25 days of complete acoustic recordings and decibel measurements were collected at these three locations over a three month period.	$32,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Big Horn Sheep Connectivity Study	Determines sheep movement across the monument to identify populations and genetics	wildlife, animal ecology, habitat connectivity, climate change, bighorn sheep	Ryan Monello, National Park Service; also Oregon State University, Utah Dept of Wildlife Resources	Research in progress	$0
Cougar Connectivity Study	GSENM is the last area to be studied on the Colorado Plateau. Determines the movement and ranges of cougars	wildlife, animal ecology, habitat connectivity, climate change, cougar, mountain lion	David Mattson, USGS; also NPS and Utah Division of Wildlife Resources	Research in progress	$0
Bat population and pollen study	Identify species, movement, and populations; sample pollinators to identify the various types of pollen and where it came from	wildlife, bats, ecology, zoology, botany	Terry Tolbert, GSENM; also volunteers, Dixie National Forest, BCNP	Research in progress	$1500
Hummingbird migration study	Banding and tracking migration of the different species of humming birds and their importance to pollination.	wildlife, hummingbirds, botany	Terry Tolbert, GSENM; also volunteers, Dixie National Forest, BCNP	Research in progress	$2000
Pronghorn Location Monitoring	Tracking the migration, reproduction, and forage use of five different populations of pronghorn.	wildlife, zoology, animal ecology, Pronghorn	Cameron McQuivey, GSENM; also Utah Department of Wildlife Resources, volunteers	Research in progress	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Global Survey and Inventory of Camel Spiders (Arachnida, Solifugae)	The purpose of the proposed research is to collect and inventory camel spider diversity in sites near the type localities of species previously collected and largely known only from historical records. Specimens will be used for both a higher level phylogenetic analysis of Solifugae, for a phylogenetic analysis of the Eremobatidae, and to investigate the taxonomy, ecology, behavior, and morphology of the group.	zoology, animal ecology, arachnids	Paula Cushing, Denver Museum of Nature and Science	Research in progress	$0
Estimating Occupancy Rates, Reproductive Effort and Effects of Recreation on Mexican Spotted Owls in Southern Utah	Purpose: This research project involves studying the prey dynamics of the threatened Mexican Spotted Owl in the Monument. The objective of this project is to develop a long-term (i.e., >10 year) monitoring study concerning trends in prey abundance and factors that influence spotted owl population dynamics in the Monument. A second objective of this research will be to assess the effects of climate changes on both spotted owls and their primary prey.	zoology, animal ecology, Mexican Spotted Owl, endangered species	David W. Willey, Montana State University Department of Ecology	Research in progress	$0
A study of American Black Bears (*Ursus americanus*) on the Paunsaugunt Plateau, Utah	This project will to identify the movements of black bears on the Paunsaugunt Plateau in relation to centers of human activity and anthropogenic food sources, including: documenting movement, association with anthropogenic food sources, annual reproduction and survival data, evaluating methods for aversively conditioning food-conditioned bears.	zoology, animal ecology, wildlife, behavioral ecology	Dr. Tom Smith, Brigham Young University, Wildlife and Wildlands Conservation Program	Research in progress; quarterly progress reports submitted	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
untitled	This project will conduct a taxonomic revision and provide an identification key for the New World species of Heliophila.	zoology, arthropods, bees	Michael Orr, Terry Griswold, Harold Ikerd, Skyler Burrows, Jonathan Koch, Zachary Portman, Joan Meiners, David Denlinger, Emily Sadler, Zachary Valois: Utah State University, Dept of Biology and USDA-ARS National Pollinating Insect Collection	Research In progress; annual report submitted	$0
Habitat and Biodiversity Monitoring Using Terrestrial Arthropod Surveys	This project seeks to search for and collect a new moth species in the genus Plagiomimicus (Noctuidae, Amphipyrinae), conduct a general sampling of moths, and search for and collect a new subspecies (possible new species) of butterfly diurnally (net) in the genus Euphilotes (Lycaenidae).	zoology, ecology, animal ecology, lepidoptera, arthropods	Paul Opler and David Wikle, Colorado State University	Research in progress; annual report submitted; one publication in a peer-reviewed journal	$0
untitled	Purpose: To conduct bird surveys and surveys for tamarisk beetle in the Escalante-Grand Staircase National Monument.	zoology, ecology, ornithology, invertebrate zoology	Jason Beason, Rocky Mountain Bird Observatory	Research in progress	$0
Diversity and distribution of GSENM Lepidoptera (butterflies)	This project will develop a baseline inventory of the Lepidoptera (primarily butterflies) of GSENM, with emphasis on diversity and distribution. It is expected to provide data with which other studies can be compared. Other arthropods will also be collected and documented as the opportunity presents itself.	zoology, Leipidoptera	Dr. Richard Zweifel	Research in progress; annual report submitted	$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Diversity of insect populations with a focus on systematic biology and life history of Southwestern moth species	This project is part of ongoing research exploring insect diversity on public lands in Texas, New Mexico, Arizona and Utah. It focuses on moths in the family Geometridae in an effort to gain insight into the taxonomic position and host plant associations of selected species in the genus Nemoria.	zoology, Leipidoptera	John W. Gruber, Friends' Central School and Jason D. Weintraub, Academy of Natural Sciences of Philadelphia	Research in progress	$0
Colorado Plateau Rapid Ecoregional Assessment (REA) Step-down for the Escalante River Watershed	The Utah State University Department of Watershed Sciences is working with the GSENM and Utah State Office to integrate the Colorado Plateau REA and step-down analysis to the Escalante River Watershed to aid in management planning. This project will identify resource conditions, stressors, and management priorities in the Escalante River watershed and determine if an integrated assessment can be meaningfully applied to local resource management with the objective of developing and integrating appropriate assessment tools into watershed resources planning.	Aquatics, Vegetation, Riparian, Rapid Ecoregional Assessment	Scott Miller; BLM National Aquatic Monitoring Center Brian Laub, Wally MacFarlane, Joe Wheaton; Department of Watershed Sciences Utah State University	Research in progress currently in Phase 1	$130,000
BLM Utah GSENM IIC Youth Outreach, Education and Title I Crew and Internship Wildlife and Resource Management Project - Assistance Agreement L16AC00118	The purpose of this agreement is to provide enhanced academic or educational opportunities to Title 1 Native American, underserved, and rural disadvantaged youth from 16-35. These opportunities also serve as an introduction to careers in the BLM under the mentorship of a wide variety of public land management specialists. .	Youth, Education, Public Land Corps, Internships, Natural and Cultural Resource Conservation	Brian Raper, Partnership Director, Southern Utah University Intergovernmental Internship Cooperative (IIC)	Accomplishment included in Youth Partner Employment Report	$73,500.00

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
GSENM Volunteer, Science, and Education Program - Assistance Agreement L14AC000324	Provides volunteer, educational, and interpretive services including educational and visitor services staff, the production of interpretive and educational materials, funding for interpretive, educational, and research purposes, and cooperating services and funding for research and development of materials of interpretive and educational value to enhance the public knowledge and appreciation of BLM's role in the research and management of public lands, including recreation and natural, cultural, and historic resources.	Volunteers, Education, Interpretation, Public Outreach	Noel Poe, Grand Staircase Escalante Partners Executive Director	Accomplishments included as part of division reports, i.e. Volunteer; Education, Interpretation; Archeology Site Steward; Paleontology Program; and Escalante River Watershed Partnership	$204,140.00

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY16)
Ground Water Study to Document MODFLOW groundwater model developed for GSENM in an Open-File report and update 2013 well inventory to include new 2014 and 2015 well locations.	The USGS, Utah Water Science Center, will document the construction and results on an existing numerical groundwater model (MODFLOW) developed for the GSENM in an Open-File Report. The model can be used as a tool for simulating and testing the conceptual understanding of the GSENM groundwater system. The USGS also plans to update the 2013 well inventory to include new wells drilled in 2014 and 2015. The area of coverage will be same as the previous inventory, to include the entire GSENM as well as the lands adjacent to the GSENM. The inventory will include 1) review and completion of missing data elements in the existing inventory (where additional data is available), 2) updating the inventory data base with all new wells drilled since the last inventory, and 3) the inventory of wells will be mapped into GIS coverage, so that individual wells can be reviewed for relevant information, such as date drilled, total depth drilled, producing aquifer, producing yield, screened interval, etc. Approximately 12 data attributes will be selected to comprise the well data, and will be selected by mutual agreement with USGS and BLM.	hydrology, groundwater, ecology	Melissa Masbruch USGS Utah Water Science Center	Research in progress	$45,000

5 Resources, Objects, Values and Stressors

Scientific Study and Landscape-Related Values

The GSENM's vast and austere landscape embraces a spectacular array of scientific and historic resources. This high, rugged, and remote region, where bold plateaus and multi-hued cliffs run for distances that defy human perspective, was the last place in the continental United States to be mapped. Even today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific study. The monument has a long and dignified human history: it is a place where one can see how nature shapes human endeavors in the American West, where distance and aridity have been pitted against our dreams and courage. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values.

The values described in the Proclamation include: a vast and austere landscape; a rugged and remote landscape character; an unspoiled natural area, where natural processes are unaltered by man; a frontier character; and a long and dignified human history. The primary value of the Monument is its value for the scientific study of human history, flora and plant refugia, geology and the formation of the earth, paleontology of the late Cretaceous Era, modern vegetative communities, endemic plants and pollinators, relict vegetation, wildlife, soils and soil crusts, and unusual isolated biological communities.

Status and Trend Scientific Study and Landscape-related Values		
Value	**Status**	**Trend**
Scientific study	Good	Stable
Vast and austere landscape	Good	Stable
Rugged and remote character	Good	Stable
Unspoiled natural area	Good	Stable
Frontier character	Good	Stable
Long, dignified human history	Good	Stable

Inventory, Assessment, Monitoring Scientific Study and Landscape-related Values				
Object or Value	**Inventory Type**	**Amount Inventoried (acres, miles, etc.)**	**Amount Possessing Object (acres, miles, etc)**	**Amount Monitored (acres, miles, etc.)**
Scientific study	N/A; see project listing, Section 4	See project listing, Section 4	See project listing, Section 4	See project listing, Section 4
Vast and austere landscape	Visual Resource Management System (Scenic Quality, Sensitivity, Distance Zones)	1.9 million acres	1.9 million acres	Monument lands monitored as needed per individual project requirements. Updated Visual Resource Inventory anticipated completion 2016.
Rugged and remote character	1980 BLM Utah Wilderness Inventory; 1999 BLM Utah Wilderness Inventory	881,997 acres of Wilderness Study Area or Instant Study Area; 208,438 additional acres of lands with wilderness characteristics	1,090,435	881,197
Unspoiled natural area	1980 BLM Utah Wilderness Inventory; 1999 BLM Utah Wilderness Inventory	881,997 acres of Wilderness Study Area or Instant Study Area; 208,438 additional acres of lands with wilderness characteristics	1,090,435	881,197

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Frontier character	1980 and 1999 BLM Utah Wilderness inventory; see also cultural resource inventory	881,997 acres of Wilderness Study Area or Instant Study Area; 208,438 additional acres of lands with wilderness characteristics	1,090,435	881,197
Long, dignified human history	See cultural resource inventory	130,000 acres	5,000 sites	Approximately 100 sites monitored annually through Site Steward program and in house monitoring; otherwise, Monument lands spot checked and/or inventoried to a Class III standard per individual project requirements

Stressors Affecting Scientific Study and Landscape-Related Values

Climate change: Climate change is a broad environmental stressor with the potential to drastically change the character of the landscapes within GSENM, our ability to protect objects and values for which GSENM was designated (especially natural resources), and to manage resource use. In the next 50 years, the Colorado Plateau REA has predicted the Monument will be severely impacted by drought, which may result in the loss of critical elements of major plant communities, including loss of pinyon pine in the pinyon pine-juniper vegetation community which currently covers nearly 35% of the Monument, and associated impacts to wildlife, water quantities and quality, and increased erosion. This change will alter the area's value for scientific research, and will probably push Monument research in the direction of applied studies focused on climate change impacts to Monument resources. Adequate planning to mitigate impacts and to address management challenges will increase workloads in the long-term. Potential effects include drought and severe flash floods.

Increasing Recreational Use: GSENM is experiencing constantly increasing recreational use as a result of national and international advertisement promoting it as an iconic canyon country destination. Tourism promotion through campaigns such as The Mighty Five: Utah's National Parks draw increasing amounts of visitors to the Bryce Canyon, Capitol Reef, and Zion National Park. GSENM is located squarely in the midst of these parks which presents management challenges in balancing use with adequate protection of GSENM objects and values. Increased backcountry visitor impacts include increased graffiti, human waste issues, water quality concerns and parking congestion. Dispersed campsites are proliferating. Planning efforts are needed to insure adequate use management and resource protection.

R.S. 2477 litigation and travel management plan implementation: R.S. 2477 litigation has pulled key specialist positions (including GIS and Realty specialists, but also including Range Management specialists, Backcountry Rangers, and others) away from day to day workload needing completion. Meeting the data requirements of, and supporting Solicitor and Department of Justice needs has meant a reduction in staff ability to support GSENM programs and accomplish work on the ground. The on-going litigation has also hindered effective implementation of the travel management plan. As noted previously, routes have not been effectively closed and/or rehabilitated, and on-going communication and coordination issues have hampered signage and maintenance efforts.

Geological Objects and Resources

"The monument is a geologic treasure of clearly exposed stratigraphy and structures. The sedimentary rock layers are relatively undeformed and unobscured by vegetation, offering a clear view to understanding the processes of the earth's formation. A wide variety of formations, some in brilliant colors, have been exposed by millennia of erosion. The monument contains significant portions of a vast geologic stairway, named the Grand Staircase by pioneering geologist Clarence Dutton, which rises 5,500 feet to the rim of Bryce Canyon in an unbroken sequence of great cliffs and plateaus. The monument includes the rugged canyon country of the upper Paria Canyon system, major components of the White and Vermilion Cliffs and associated benches, and the Kaiparowits Plateau. That Plateau encompasses about 1,600 square miles of sedimentary rock and consists of successive south-to-north ascending plateaus or benches, deeply cut by steep-walled canyons. Naturally burning coal seams have scorched the tops of the Burning Hills brick-red. Another prominent geological feature of

the plateau is the East Kaibab Monocline, known as the Cockscomb. The monument also includes the spectacular Circle Cliffs and part of the Waterpocket Fold, the inclusion of which completes the protection of this geologic feature begun with the establishment of Capitol Reef National Monument in 1938 (Proclamation No. 2246, 50 Stat. 1856). The monument holds many arches and natural bridges, including the 130- foot-high Escalante Natural Bridge, with a 100 foot span, and Grosvenor Arch, a rare "double arch." The upper Escalante Canyons, in the northeastern reaches of the monument, are distinctive: in addition to several major arches and natural bridges, vivid geological features are laid bare in narrow, serpentine canyons, where erosion has exposed sandstone and shale deposits in shades of red, maroon, chocolate, tan, gray, and white. Such diverse objects make the monument outstanding for purposes of geologic study."

The geological resources of GSENM contribute to the regional geology acknowledged worldwide for its scenic beauty. As noted in the Proclamation, these resources are clearly exposed, providing windows on geologic processes such as erosion, deposition and deformation, which represent "outstanding" opportunities for scientific study.

Status and Trend Geological Objects and Resources		
Value	**Status**	**Trend**
Grand Staircase	Good	Stable
White Cliffs	Good	Stable
Vermillion Cliffs	Good	Stable
Kaiparowits Plateau	Good	Stable
Circle Cliffs	Good	Stable
East Kaibab Monocline The Cockscomb	Good	Stable
Waterpocket Fold (portion of it)	Good	Stable
Upper Paria Canyon System	Good	Stable
Upper Escalante Canyons	Good	Stable
Burning Hills coal seams	Good	Stable
Escalante Natural Bridge	Good	Stable
Grosvenor Arch	Good	Stable
Arches and Natural Bridges	Good	Stable

Inventory, Assessment, Monitoring Geological Objects and Resources				
Object or Value	**Inventory Type**	**Amount Inventoried (acres, miles, etc.)**	**Amount Possessing Object (acres, miles, etc)**	**Amount Monitored (acres, miles, etc.)**
Grand Staircase	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
White Cliffs	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Vermillion Cliffs	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Kaiparowits Plateau	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Circle Cliffs	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
East Kaibab Monocline - The Cockscomb	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Waterpocket Fold (portion of it)	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Upper Paria Canyon System	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Upper Escalante Canyons	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known physiographic feature
Burning Hills coal seams	USGS topographic and geologic maps	1.9 million acres (all of GSENM)		known geologic feature
Escalante Natural Bridge	individual known geologic feature	1.9 million acres (all of GSENM)	1 each	individual known geologic feature
Grosvenor Arch	individual known geologic feature	1.9 million acres (all of GSENM)	1 each	individual known geologic feature

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Arches and Natural Bridges	USGS topographic and geologic maps	Unknown	unknown	many known geologic features mapped; no separate GSENM-wide inventory

Stressors Affecting Geological Objects and Resources

Some recreational use, especially technical climbing, and vandalism, have the potential to adversely affect geological resources. Such impacts are typically localized, although they have the potential to be locally significant. The Recreation program has been considering ways such impacts can be better managed, a Canyoneering and Climbing Plan for SRP management is scheduled to begin by 2017.

No other stressors known.

Paleontological Objects and Resources

The monument includes world class paleontological sites. The Circle Cliffs reveal remarkable specimens of petrified wood, such as large unbroken logs exceeding 30 feet in length. The thickness, continuity and broad temporal distribution of the Kaiparowits Plateau's stratigraphy provide significant opportunities to study the paleontology of the late Cretaceous Era. Extremely significant fossils, including marine and brackish water mollusks, turtles, crocodilians, lizards, dinosaurs, fishes, and mammals, have been recovered from the Dakota, Tropic Shale and Wahweap Formations, and the Tibbet Canyon, Smoky Hollow and John Henry members of the Straight Cliffs Formation. Within the monument, these formations have produced the only evidence in our hemisphere of terrestrial vertebrate fauna, including mammals, of the Cenomanian-Santonian ages. This sequence of rocks, including the overlaying Wahweap and Kaiparowits formations, contains one of the best and most continuous records of Late Cretaceous terrestrial life in the world.

The Monument’s paleontological resources are becoming better known to the greater research community as a result of 17 years of BLM sponsored collaborative, interdisciplinary research. During that time, teams from more than two dozen museums and universities have documented thousands of new fossil sites. From these sites many truly world class fossils have been collected including over twenty

new species of dinosaur, giant alligators, turtles, fish, mammals, and a spectacular fossil tropical flora. The result has been that the expectations of the Proclamation have actually been exceeded, placing GSENM in the unique position as the most diverse and significant southern Laramidian terrestrial Cretaceous locality, that rivals the importance of the Dinosaur Provincial Park World Heritage site in Alberta, Canada. Monument finds are causing the research community to revise long held ideas on Cretaceous dinosaur diversity and ecology and serve as a touchstone for most new hypotheses on these topics. The Kaiparowits Formation (76-74 million years old) consistently produces spectacular fossil finds of all types, but the Wahweap, Tropic, Straight Cliffs and other formations (see Management Recommendations, below) have also yielded many highly significant sites. Jurassic and the Triassic strata also contain significant resources, but at a much lower volume.

Status and Trend Paleontological Objects and Resources		
Value	**Status**	**Trend**
Late Cretaceous fossils	Generally good. Looting of fossil wood occurs regularly in the Head of the Creeks areas. Looting of bone occurs intermittently in the Four Mile Bench and “The Blues” areas.	Generally stable
Petrified wood – Circle Cliffs	Subjected to periodic looting near Wolverine Trailhead. Most other localities are good.	Generally stable

Inventory, Assessment, Monitoring Paleontological Objects and Resources				
Object or Value	**Inventory Type**	**Amount Inventoried (acres, miles,**	**Amount Possessing Object (acres, miles, etc)**	**Amount Monitored (acres, miles, etc.)**
Late Cretaceous fossils	Fossil resources occur unpredictably in bedrock outcrop areas (badlands and sparsely vegetated/thinly soiled over areas). These areas are covered by pedestrian surveys with experienced crews.	134,466 acres (7% of GSENM) surveyed through FY15; 4,957 new acres surveyed in FY16 Totals are taken from annual reports published by formal partners and the in house GSENM paleontologist.	139,423 acres. About half of that acreage contains known resource. 54 new fossil sites were documented by BLM crews during FY16: and additional 126 sites were documented by the DMNS and NHMU. All but seven are vertebrate sites; all of the sites are in Cretaceous age strata of the Kaiparowits Basin. 16 sites were excavated or required intensive surface collection by larger BLM crews.	A total of 35 sites were monitored in FY16
Petrified wood – Circle Cliffs	Pedestrian Survey. Fossil forest area is estimated at 50,000 acres. Inventory has not been started.	0 (Circle Cliffs wood resource has been claimed by Sid Ash to be the 2nd largest in North America next to Petrified Forest National Park)		The Wolverine Trailhead site (one site, ~5 acres) is monitored every year, including FY16, for qualitative condition. No unauthorized collection was noted in FY16.

Stressors Affecting Paleontological Objects and Resources

The primary stressor affecting paleontological resources is natural erosion from deeply rooted xeric plants, freeze thaw, and intense precipitation events, followed by anthropogenic ground- disturbing activities, looting, and vandalism. When disturbances would result from Proposed Actions on Federal land they can be analyzed in advance through the NEPA process, allowing for mitigation to protect paleontological resources. Land uses (such as recreation and grazing) are believed to have minimal impacts to fossil resources. At the other end of the spectrum are fossil theft and vandalism which pose serious threats. Active in house BLM inventory programs, as well as those of other institutions, help to identify where high value resources are at risk and allow for prioritization of mitigation measures. Scientific collection and curation in an approved public repository is frequently the best solution for at risk vertebrate body fossils and collaborative work between the BLM, the Natural History Museum of Utah, and the Denver Museum of Nature and Science ensure that the highest priority specimens are protected.

Cultural Resources (Archaeological and Historic) Objects and Resources

"Archeological inventories carried out to date show extensive use of places within the monument by ancient Native American cultures. The area was a contact point for the Anasazi and Fremont cultures, and the evidence of this mingling provides a significant opportunity for archeological study. The cultural resources discovered so far in the monument are outstanding in their variety of cultural affiliation, type and distribution. Hundreds of recorded sites include rock art panels, occupation sites, campsites and granaries. Many more undocumented sites that exist within the monument are of significant scientific and historic value worthy of preservation for future study.

The monument is rich in human history. In addition to occupations by the Anasazi and Fremont cultures, the area has been used by modern tribal groups, including the Southern Paiute and Navajo. John Wesley Powell's expedition did initial mapping and scientific field work in the area in 1872. Early Mormon pioneers left many historic objects, including trails, inscriptions, ghost towns such as the Old Paria townsite, rock houses, and cowboy line camps, and built and traversed the renowned Hole-in-the-Rock Trail as part of their epic colonization efforts. Sixty miles of the Trail lie within the monument, as does Dance Hall Rock, used by intrepid Mormon pioneers and now a National Historic Site."

Cultural resources on GSENM include both historic and prehistoric sites, as named in the Proclamation. The cultural resource program also addresses Traditional Cultural Properties (TCP), Native American Sacred Sites, and cultural landscapes. Several

potential TCPs have been identified by the Paiute and the Navajo, but have not yet been finalized.

Status and Trend Archaeological Objects and Resources		
Value	**Status**	**Trend**
Archaeological sites	generally good, although examples ranging from “Poor” to “Excellent” can be found across GSENM	generally stable, perhaps with a slight downward trend primarily due to natural erosional processes, but also including human impacts from visitation, looting, and vandalism
Historic object and values	generally good	generally stable

Inventory, Assessment, Monitoring Archaeological Objects and Resources				
Object or Value	**Inventory Type**	**Amount Inventoried (acres, miles, etc.)**	**Amount Possessing Object (acres, miles, etc)**	**Amount Monitored (acres, miles, etc.)**
Archaeological sites	Primarily pedestrian inventory and recording, although aerial techniques (helicopters) have been used to record inaccessible, cliff side sites.	130,000 acres (~7% of GSENM)	Approx.5,000 sites NOTE: The site types listed in the Proclamation (Anasazi cultural sites, Fremont cultural sites, rock art panels, occupations sites, campsites and	80 sites

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Modern tribal use (Southern Paiute, Hopi, and Navajo)				"Inventory" not applicable to this category; Native American use of GSENM continues on an opportunistic basis, use restrictions are generally not applied.
Powell Expedition Routes/Sites	pedestrian inventories			No inventories for the Powell expedition routes initiated.
Mormon Pioneer Trails				Primary trails are well known; no other systematic GSENM wide inventory except an ongoing, low priority project to map the old cowboy trails before they disappear; priority may increase due to the grazing EIS.
Historic Inscriptions	pedestrian inventories	130,000 acres (~7% of GSENM)	270 sites	Historic inscriptions are a common element at historic sites, and are common across GSENM; numbers approximate.

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Ghost towns	(see Old Paria Townsite, below)	1.9 million acres (all of GSENM)	1 site	The Old Paria Townsite is the only known "ghost town" within GSENM. The historic community of Rock House was located on GSENM, but it is suspected to have been washed away by flooding of the Paria River in historic times.
Rock houses	pedestrian inventories			"Rock house" is not a specific historic structure type. Any historic cabin or structure may be recorded as such, with construction technique being secondary. Examples of rock constructed houses can be found in the Old Paria Townsite (see below)

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Cowboy line camps, currently used	Sites, Permit, RAS/RIPs	300,000 acres (~16% of GSENM)	9 each	To date approximately 56 line camps have been inventoried; each year different line camps are utilized depending on where the workload is identified
Cowboy line camps, historic	pedestrian inventories	130,000 acres (~7% of GSENM)	80 each	Historic livestock related camps, number approximate

Stressors Affecting Cultural Resources Objects and Resources

Interest in Hole in the Rock corridor: Management of the Hole in the Rock corridor is complicated by one long-standing issue, and several rising issues. These include a need to complete SRMA planning for the Escalante Canyons area, a task identified in the 2000 Monument Management Plan; resource concerns arising from increasing traffic on the road; State of Utah litigation to settle RS2477 ROW claims, including the Hole in the Rock Road; Garfield County interest in reducing maintenance issues on the road through changing the surface character; and the identification of the Hole in the Rock route and associated historic sites as eligible for consideration as Traditional Cultural Properties by the culturally-affiliated Church of Jesus Christ of Latter-day Saints.

Other stressors affecting slight downward trend in condition: Other stressors include erosion and other natural processes and human impacts from recreation, looting and vandalism. Additionally, there may be grazing impacts such as trampling, trailing, and resultant increased erosion.

Biological Objects and Resources

“Spanning five life zones from low-lying desert to coniferous forest, with scarce and scattered water sources, the monument is an outstanding biological resource. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values. The blending of warm and cold desert floras, along with the high number of endemic species, place this area in the heart of perhaps the richest floristic region in the Intermountain West. It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia. Geologic uplift with minimal deformation and subsequent downcutting by streams have exposed large expanses of a variety of geologic strata, each with unique physical and chemical characteristics. These strata are the parent material for a spectacular array of unusual and diverse soils that support many different vegetative communities and numerous types of endemic plants and their pollinators. This presents an extraordinary opportunity to study plant speciation and community dynamics independent of climatic variables. The monument contains an extraordinary number of areas of relict vegetation, many of which have existed since the Pleistocene, where natural processes continue unaltered by man. These include relict grasslands, of which No Mans Mesa is an outstanding example, and pinon-juniper communities containing trees up to 1,400 years old. As witnesses to the past, these relict areas establish a baseline against which to measure changes in community dynamics and biogeochemical cycles in areas impacted by human activity. Most of the ecological communities contained in the monument have low resistance to, and slow recovery from, disturbance. Fragile cryptobiotic crusts, themselves of significant biological interest, play a critical role throughout the monument, stabilizing the highly erodible desert soils and providing nutrients to plants. An abundance of packrat middens provides insight into the vegetation and climate of the past 25,000 years and furnishes context for studies of evolution and climate change. The wildlife of the monument is characterized by a diversity of species. The monument varies greatly in elevation and topography and is in a climatic zone where northern and southern habitat species intermingle. Mountain lion, bear, and desert bighorn sheep roam the monument. Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.

This proclamation does not reserve water as a matter of Federal law. I direct the Secretary to address in the management plan the extent to which water is necessary for the proper care and management of the objects of this monument and the extent to which further

action may be necessary pursuant to Federal or State law to assure the availability of water."

The values described in the Proclamation include a broad diversity of plants, animal, communities and ecosystems. The plants include warm and cold desert flora and a high number of endemic species. Plant communities include: hanging gardens, tinajas and rock crevice, canyon bottom and dunal pocket communities and biological soil crusts. A wide diversity of animals are supported by the varied plant communities, precipitation/elevation zones and soils including: mule deer, mountain lion, bear, desert bighorn sheep, pronghorn, birds (including many raptors), numerous reptiles and amphibians and countless invertebrate species. Ecosystems include widely variable desert, semi-desert, mountains, canyon, slickrock, aquatic systems and relict grasslands. The remoteness and relative inaccessibility of much of the Monument provides unique opportunities for studying past, present and future population, community, ecosystem and landscape dynamics, including biogeochemical and hydrological cycling.

Proclamation language regarding aquatic resources is limited, as shown by the quotes above, which are the only mentions of water or aquatic resources. However, it is clear from the Proclamation's requirement for "… the Secretary to address … the extent to which water is necessary for the proper care and management of the objects…," that we are to manage water insofar as it is important for other objects (e.g., to sustain ecological processes that affect soils, plants, animals and all resources that constitute this "outstanding biological resource"). The Monument's objectives with respect to water are to ensure that appropriate quality and quantity of water resources are available for the proper care and management of the objects of the Monument,; to increase public education and appreciation of water resources through interpretation; and to facilitate appropriate research to improve management of water resources.

All plants and animals are ultimately dependent on soils, without which there can be no terrestrial life. The biodiversity on GSENM described in other sections is a result of the diversity of soils coupled with variation in other environmental variables (such as precipitation, temperature regime, landform, elevation, topography, aspect). Continued protection of soils and soil productivity, especially from loss due to erosion that is controllable by management practices, is of paramount importance to sustainable management of the Monument.

Status and Trend Biological Objects and Resources		
Value	**Status**	**Trend**
Hanging Gardens Floristic Communities	Mostly unassessed; where assessed conditions are good.	The sites that have been observed are stable.
Tinajas Floristic Communities	Unassessed	unknown
Rock Crevice Floristic Communities	Unassessed	unknown
Canyon Bottom Floristic Communities	Unassessed	Unknown
Dunal Pocket Floristic Communities	Unassessed	Unknown
Endemic plants and their pollinators	Mostly unassessed; <1% of the GSENM	Unknown
Relict Plant Communities	Unassessed	unknown
No Man's Mesa	Poor if considered a relic grassland	Static to Downward (due to natural succession)
Pinyon Juniper Communities with up to 1,400 to trees	Good	Stable
Mountain lion	Good	Stable
Bear	Good	Stable to Increasing
Desert Bighorn Sheep Habitat	Good	Increasing
200 Bird Species	Good	Stable
Bald Eagles	Good	Stable to Increasing
Peregrine Falcons	Good	Stable to Increasing
Neo tropical Birds in riparian corridors (Paria and	Good	Stable
Riparian Corridors	Varies; conditions range from Proper Functioning Condition (PFC; most), to Functioning at Risk (FAR), with a few Non Functioning (NF)	Varies; PFC mostly stable; most of FAR and NF are upward to PFC
Cryptobiotic Crusts (biological soil crusts)	Where known, ranges from good to poor, but generally unknown	Varies, but mostly unknown
Packrat Middens	Good	Stable

Value	Status	Trend
Water sources (streams, springs, seeps, tinajas, wells)	Where assessed conditions range from good to poor (a number of stream segments do not meet UT water quality standards and are included on the 303(d) list. Springs have mostly been assessed and protected where possible	Varies, but most springs are stable, many seeps are unknown. Actively running streams have been assessed.
Soils	Where known, ranges from good to poor, but generally unknown	Unknown
Forestry (Ponderosa Pine)	Good	Stable

Inventory, Assessment, Monitoring Biological Objects and Resources				
Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Hanging Gardens Floristic Communities	no systematic GSENM wide inventory; extent unknown			0
Tinajas Floristic Communities	no systematic GSENM wide inventory; extent unknown			0
Rock Crevice Floristic Communities	no systematic GSENM wide inventory; extent unknown			0

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Canyon Bottom Floristic Communities	Modified Whitaker Plots no systematic GSENM wide inventory; extent unknown	Tom Stohlgren with CSU performed baseline vegetation surveys in the late 1990s early 2000s that recorded some of this community		0
Dunal Pocket Floristic Communities	no systematic GSENM wide inventory; extent unknown			0
Endemic plants and their pollinators	Ocular Surveys	16 sites	200,000 acres	2 sites
Relict Plant Communities	no systematic GSENM wide inventory; extent unknown			0
No Man's Mesa	Long Term Trend Studies	1,500 acres	1,500 acres	750 acres
Pinyon Juniper Communities with up to 1400 year old trees	Modified Whitaker Plots, Buckskin monitoring plots 1000' meter. no systematic GSENM wide inventory; extent unknown	38,000 acres		4 projects monitored in Pinyon Juniper (JC)

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Diversity of wildlife species	Trapping, Sampling, point counts, mist netting, vehicular surveys, wildlife observation reports, telemetry	Since 1999, numerous universities, permanent and seasonal staff, have contributed to roughly 1,425,000 acres of inventory. Nearly all habitat types have been inventoried.	1.9 million acres (entirety of GSENM) contributes to diversity due to a wide array of habitats and ecosystems.	Annually, a percentage of the Monument is monitored for continued presence of diverse species through mist netting, point counts, and observations.
Mountain lion	Wildlife observation reports, hunter harvest reports, tracking and trapping	Not inventoried specific for Mountain Lion. Relying mostly on observations, hunter harvest reports, and a recent study involving tracking and collaring of several mountain lions for scientific study.	1.9 million acres (entirety of GSENM) has the possibility of having mountain lion presence at one time or another as they travel in search of home ranges and food sources.	In 2013, a collared male lion was tracked through his habitat for a period of nine months using GPS technology. The area involved included roughly 20 square miles or 256,000 acres. The lion was legally harvested in 2015, ending project.
Bear	Wildlife observation reports, hunter harvest reports	Not inventoried specific for black bear. Relying mostly on observations, and hunter harvest reports.	Approximately 300,000 acres have habitat suitable to provide life cycle requirements for bears.	N/A; Rare species occasionally inhabiting the Monument. Not monitored with a specific program.

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Desert Bighorn Sheep Habitat	UDWR census flights, telemetry data, wildlife observation reports, hunter harvest reports	Approximately 1,500,000 acres have been aerially inventoried by UDWR in recent years.	Approximately 750,000 acres have habitat requirements suitable for bighorn sheep.	Annually, the UDWR flies vast acreage on the Monument conducting census counts on four separate herd units. Additionally, BLM uses telemetry to keep track of reintroduced sheep
200 Bird Species	Point count surveys, winter raptor surveys, Christmas bird count	Approximately 1,500,000 acres have been surveyed at one time or another in search of bird species. This accounts for all of the major habitat types within the Monument.	1.9 million acres (entirety of GSENM) contributes to diversity due to a wide array of habitats and ecosystems.	Annually, BLM staff conduct point count surveys in pinyon juniper woodland, sagebrush, mixed conifer, and riparian habitats for bird diversity. Additionally winter raptor surveys and the Christmas bird
Bald Eagles	Winter raptor surveys	Approximately 200 miles of highway are surveyed annually.	1.9 million acres (entirety of GSENM) has the potential for bald eagles during migration and winter months. Use on the Monument is primarily centered around major highways where they feed on carrion during winter months before returning to summer habitat.	Winter raptor surveys along highway corridors are carried out annually to account for bald eagle trends. Approximately 200 miles are surveyed several times throughout the winter months. Bald eagles appear to be stable to increasing.

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Peregrine Falcons	Territory monitoring, raptor surveys, wildlife observation reports, winter raptor surveys.	Approximately 1,500,000 acres of GSENM have been surveyed for bird species.	Approximately 500,000 acres with habitat on cliff faces is suitable for peregrine falcon.	14 Peregrine falcon territories are monitored annually. This accounts for the known territories. Sighting reports indicate birds doing well and are expanding.
Neo tropical Birds in riparian corridors (Paria and Escalante Rivers)	Point count surveys, mist netting	Nearly the entirety of these two streams have been surveyed by BLM or UDWR for migratory birds either through point count surveys or mist netting	These two stream corridors account for approximately 50,000 acres of habitat.	Mist netting was used for baseline data in the early years of the Monument. No mist netting has been conducted in recent years. Point count surveys continue to be conducted annually at several locations along these stream corridors.
Packrat Middens	No systematic inventory to date			
Riparian Corridors	Escalante: ocular, Point Count Transects, repeat photography. Paria: Henrieville Creek.	<19,000 acres (<1% of GSENM)	Escalante: 13,500 acres	Escalante and Paria: 13,500 acres

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Cryptobiotic Crusts (biological soil crusts)	systematic survey of low disturbance sites on ~25 40% of GSENM to develop predictive model for biological soil crust abundance GSENM wide	(~25 40% of GSENM)	Unknown	Bowker, MA, J Belnap and ME Miller. 2006. Spatial modeling of biological soil crusts to support rangeland assessment and monitoring. Rangeland Ecology and Management 59(5):519 529.
Water sources (streams, springs, seeps, tinajas, wells)	1:24,000 scale topographic maps (USGS 7½ minute series)	1.9 million acres (all of GSENM)	Unknown	Unknown
Water sources (streams, springs, seeps, tinajas, wells)	water rights database (State of UT)	1.9 million acres (all of GSENM)	Unknown	Unknown
Water sources (streams, springs, seeps, tinajas, wells)	characterization of water sources (stream gauging, spring/seep flow rates, water chemistry, aquifer characterization, groundwater/ surface water exchange, human effects on quantity and quality, etc.)	380,000 acres (~20% of GSENM) estimated 20% based on previous and ongoing studies	unknown	routine water quality monitoring was conducted at 10 sites (5 year round and 5 seasonal sites); additional bacteriological monitoring timed with storm events was conducted in FY15 at recreational sites in Calf Creek

Object or Value	Inventory Type	Amount Inventoried (acres, miles, etc.)	Amount Possessing Object (acres, miles, etc)	Amount Monitored (acres, miles, etc.)
Soils	soil survey (3rd Order)	1.9 million acres (all of GSENM)	1.9 million acres	Systematic monitoring began FY13 with AIM; 21 sites monitored in FY15; 24 sites monitored in FY16.
Soils	ecological site description (final ESD with state and transition model)	1.9 million acres (all of GSENM)	23 ESDs	S&T models define "community dynamics"; GSENM has 58 ecological sites: 23 have final ESD w/ S&T; 21 have final ESD w/o S&T; 9 have draft ESD w/ S&T; 5 have no ESD
Forestry (Ponderosa Pine)	Stand Exams	6,000		Plot based inventory system samples 5 10% of inventoried stands for species composition, tree density (trees per acre, basal area, stand density index), wood volumes (tons of biomass, cords, and board feet of sawtimber), damaging agents (insects, diseases, mechanical damage), tree diameters, tree heights, tree age, etc.

Stressors Affecting Biological Objects and Resources

Climate change: Climate change is a broad environmental stressor with the potential to drastically change the character of the landscapes within GSENM, our ability to protect objects and values for which GSENM was designated (especially natural resources), and to manage resource use. In the next 50 years, the Colorado Plateau REA has predicted the Monument will be severely impacted by drought, which may result in the loss of critical elements of majorplant communities, including loss of pinyon pine in the pinyon pine juniper vegetationcommunity which currently covers nearly 35% of the Monument, and associated impacts to wildlife, water quantities and quality, and increased erosion. This change will alter the area's value for scientific research, and will probably push Monument research in the direction of applied studies focused on climate change impacts to Monument resources. Adequate planning to mitigate impacts and to address management challenges will increase workloads in the long-term. Potential effects include drought and severe flash floods.

Increasing Recreational Use: GSENM is experiencing constantly increasing recreational use as a result of national and international advertisement promoting it as an iconic canyon country destination. This presents management challenges in balancing use with adequate protection of GSENM objects and values. Increased backcountry visitor impacts include increased graffiti, human waste issues, water quality concerns and parking congestion. Dispersed campsites are proliferating. Planning efforts are needed to insure adequate use management and resource protection.

Erosion: Erosion is the primary stressor on soil resources (including biological soil crusts). Erosion is a natural process that can be changed by human activities. In addition to the direct effects of erosion on the soil itself (through soil loss and the resulting losses in productivity and hydrologic and biogeochemical capacity), erosion is an indirect threat to many other resources. Management should seek to avoid, minimize and mitigate human-caused changes to natural erosion processes wherever possible (including restoration of soil and soil processes where possible).

Land disturbing activities/land use: Land-disturbing activities and land uses can be significant stressors on soil resources (including biological soil crusts). The primary effect is through increased erosion (disturbance can remove or alter plant cover or otherwise destabilize soils) and trampling (by people, wildlife, and livestock). The effects of land disturbance/use are generally localized, but can be wide-spread

(e.g., due to livestock grazing, or recreation if not properly managed). It is important to note that the effects of grazing use are known though rangeland health assessments (soil health is one of the Utah Rangeland Health Standards: "Standard 1. Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform."), although this does not necessarily mean the condition of the soils is known. Soils can also be affected by the introduction of nutrients and toxins, either through atmospheric deposition (uncontrollable) or the intentional application of toxic chemicals (e.g., for weed control).

Water withdrawals *(NOTE: this refers to removal of water from aquifers and surface waters for various human uses: irrigation, grazing, etc.; not realty sense of "withdrawal."):* Water withdrawals have the potential to seriously affect our ability to manage and protect water- dependent resources. As noted above, the Proclamation did not "reserve water as a matter of Federal law," although BLM holds numerous water rights on GSENM, primarily associated with livestock grazing, but also associated with culinary water for the Town of Henrieville, Kodachrome State Park, and the Calf Creek Campground. In the MMP's "Strategy for Assuring Water Availability" (pp. 31-34), it is noted that new water appropriations are still available, which may in the future affect our ability to manage and protect water-dependent resources. Instream flows are not assured, although at the time the MMP was written, it was believed "that both currently and into the reasonably foreseeable future, sufficient water will continue to be available for these purposes" (instream flows assure there is enough water in streams to sustain ecological processes habitat for aquatic plants and animals, hydrologic process such as discharge and recharge, and biogeochemical processes such as nutrient cycling required for the proper management and protection of some Objects and Values). Whether this continues to be the case is unknown, but the subject of study with the USGS (see Section 4, "Science"). We need to fully implement the recommendations of the MMP (Decisions WAT-1, WAT-2 and WAT-3; pp. 31-34) to assure continued viability of water-dependent resources, especially in the face of uncontrolled stressors.

Threats to water quality: Threats to water quality come from various sources, including direct effects from most human uses (e.g., recreation, livestock grazing, ground-disturbing activities), and indirect effects from the consequences of poor management of those uses (e.g., increased erosion). As noted above, as the State of Utah improves their assessments of surface water quality, they continue to add stream segments (or entire watersheds) to the 303(d) list (the Clean Water Act-required report

to U.S. EPA of streams that do not meet designated uses). In FY14 the State of Utah issued a new draft 303(d) list, which added numerous parameters to already listed segments, and some new segments. While most of the causes (where known) are associated with natural processes such as erosion (which affects Total Suspended Solids, TSS or sediment; Total Dissolved Solids, TDS or salts/salinity; and various metals), we can manage so as to reduce erosion and its effects, both by managing to protect plant cover and by restoring erosion (and salinity) control structures. Other watershed-scale restoration projects have been (and should continue to be) developed with water quality improvement as a goal (e.g., the Escalante River restoration projects done with the Escalante River Watershed Partnership; see Section 3, "Year's Projects and Accomplishments"). Other causes, while unknown, may be associated with water withdrawals (discussed above), e.g., stream segments listed in 2010 for poor benthic macroinvertebrate habitat. Programmatic requirements for water quality monitoring (i.e., those associated with use authorizations, such as livestock grazing water quality is one of the Utah Rangeland Health Standards) should be coordinated with baseline monitoring, and both should be coordinated with the State of Utah Division of Water Quality.

The lack of reliable funding for routine baseline water quality monitoring and other water programs also stresses (limits) our ability to properly manage water.

6 Summary of Performance Measure

The objects, resources, and values identified in the Monument proclamation are generally in good condition, and have remained in good condition since the Monument was established. The values which the Monument was created to conserve, including the opportunity for scientific study, the landscape character, and the diversity of plant and animal communities and individual species found in this region of the Colorado Plateau, are still present and are still drawing scientists, the visiting public, and users from local communities. Many of the scientific objects are geological in nature, and will remain largely unchanged except for the effects of natural erosion. This is also true of paleontological resources and archaeological and historic resources, although natural erosion and a historical practice of unauthorized collecting continue to pose threats to the scientific value of these resources. Many of the biological objects for which the Monument was recognized have yet to receive systematic inventory, however, and GSENM staff cannot accurately characterize trends in their condition. This is true for many of the special biological communities hanging gardens, tinajas, rock crevice, dunal pocket, relict plant communities, and cryptobiotic crusts as well as the Monument's water resources, and will remain an issue until we have been able to conduct baseline inventory and condition assessments. The AIM program, launched in FY13 and continued in FY14, FY15, and FY16, will remedy some of these information gaps; dedicated inventory targeting these resources is still needed.

Resources, Objects, and Values Status Summary Table		
Resource, Object, or Value	**Status**	**Trend**
Scientific study	Good	Stable
Vast and austere landscape	Good	Stable
Rugged and remote character	Good	Stable
Unspoiled natural area	Good	Stable
Frontier character	Good	Stable

Resource, Object, or Value	Status	Trend
Long, dignified human history	Good	Stable
Grand Staircase	Good	Stable
White Cliffs	Good	Stable
Vermilion Cliffs	Good	Stable
Kaiparowits Plateau	Good	Stable
Circle Cliffs	Good	Stable
East Kaibab Monocline—The Cockscomb	Good	Stable
Waterpocket Fold (portion on Monument)	Good	Stable
Upper Paria Canyon System	Good	Stable
Upper Escalante Canyons	Good	Stable
Burning Hills coal seams	Good	Stable
Escalante Natural Bridge	Good	Stable
Grosvenor Arch	Good	Stable
Arches and Natural Bridges	Good	Stable
Late Cretaceous fossils	Generally good	Generally stable
Petrified wood — Circle Cliffs	Generally good; some periodic looting at Wolverine Trailhead	Generally stable

Resource, Object, or Value	Status	Trend
Archaeological sites	Generally good; range from “Poor” to “Excellent”	Generally stable, some natural erosion
Historic objects	Generally good	Generally stable
Hanging Gardens Communities	Good, where assessed	Stable
Tinaja Communities	Unassessed	Unknown
Rock Crevice Communities	Unassessed	Unknown
Canyon Bottom Communities	Unassessed	Unknown
Dunal Pocket Communities	Unassessed	Unknown
Endemic plants and pollinators	Mostly unassessed	Unknown
Relict Plant Communities	Unassessed	Unknown
No Man’s Mesa Relict Grassland	Poor (not a relict grassland)	Stable to Downward, due to natural succession
Pinyon Juniper Communities	Good	Stable
Mountain lion	Good	Stable
Bear	Good	Stable to increasing
Desert Bighorn Sheep Habitat	Good	Increasing
200 Bird Species	Good	Stable
Bald Eagle	Good	Stable to increasing

Resource, Object, or Value	Status	Trend
Peregrine Falcon	Good	Stable to increasing
Neo tropical birds (Paria and Escalante Rivers)	Good	Stable
Riparian corridors	Most at Proper Functioning Condition, few are Non Functioning	Varied
Cryptobiotic Crusts (biological soil crusts)	Good to poor; mostly unassessed	Unknown
Packrat Middens	Good	Stable
Water sources	Good to poor	Varied
Soils	Good to poor	Unknown
Forestry (Ponderosa Pine)	Good	Stable

Manager's Letter

The 20th Anniversary of Grand Staircase-Escalante National Monument provided an excellent opportunity to reflect on, promote and celebrate the many opportunities and accomplishments seen since this Monument was established on September 18, 1996. The Science Symposium focused on and highlighted Science Research and discoveries over the past 10 years. This Managers Report highlights the opportunities and accomplishments over the past fiscal year. In addition to celebrating the 20th Anniversary of the Monument with events, presentations, publications and a Science Forum, we expanded our public outreach efforts with our Traveling Exhibits program, the Artist-in-Residence Program, and many interpretive events, presentations, talks and programs. We initiated plans for new interpretive exhibits including outside interpretive panels at the Escalante Interagency Center, interior exhibits at the Big Water Visitor Center and a series of Respect and Protect Community exhibits. We focused on managing and protecting resources through improving rangeland health on many allotments, updating range improvements, completing AIM monitoring on additional sites, continued studies on hummingbirds and bats, initiated Greater Sage-Grouse habitat assessments, completed salinity control projects, completed wildlife habitat improvement and monitoring projects and worked on riparian restoration projects and Escalante River Watershed Restoration. We completed improvements at Deer Creek Campground and started work at the Whitehouse campground. We improved facility security and provided authorizations for local businesses and utilities. We advanced research and monitoring of acoustics/soundscapes, Dark Skies and Paleontology, and managed the steadily increasing visitation on the Monument. Progress was made on the Grazing EIS, with the Draft scheduled to be released to the public in 2017. Monument management, staff, volunteers and partners are proud to share highlights of these successes.

The Anniversary also provided an opportunity to look to our roots, the Monument Proclamation, to assess our mandate for management of the Monument, not only for the past 20 years and the past fiscal year, but also for the future management of Grand Staircase-Escalante National Monument. The very first words of the Proclamation identify the Monument's birth in science and the reason for its designation as a Monument: "The GSENM's vast and austere landscape embraces a spectacular array of scientific and historic resources." We are all committed to this vast and austere landscape that embraces a spectacular array of scientific and historic resources. We are all committed to see that this "unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific

study." We are all committed to see that the exemplary opportunities for science on the Monument continue and expand. We are all committed to preserve, protect and restore Grand Staircase Escalante National Monument.

Our thanks and appreciation to all of our current and former staff, volunteers, partners, and supporters for all of your hard work and efforts to help manage, restore, protect and promote GSENM, and remain true to the directives in the Proclamation.

Cindy Staszak
Monument Manager

Grand Staircase-Escalante

National Monument

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