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All,
Here is the managers report on GSENM.

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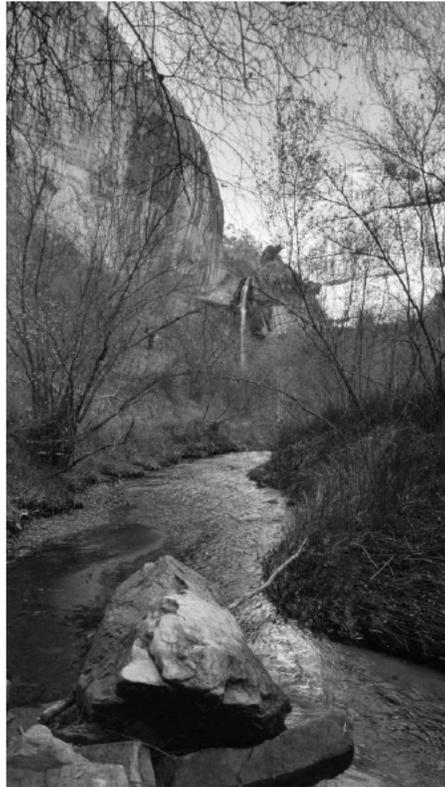
BLM

Manager's Annual Report

2015

Grand Staircase-Escalante National Monument

Manager's Annual Report
FY 2015



Utah

**NATIONAL
CONSERVATION
LANDS**



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Cover photo clockwise from left to right: Pareas Town Site, Lower Calf Creek Falls, pictographs, Burr Trail slot canyon, fossil dinosaur Hadrosaur metatarsal.

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) is managed by the Bureau of Land Management (BLM) as part of the National Landscape Conservation System. Reporting directly to the BLM Utah State Office, the Monument Manager oversees approximately 1.8 million acres of 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	BLM Acres	Other Fed. Acres	State Acres	Other Acres
1,880,461	1,866,331	0	0	14,130

Contact Information

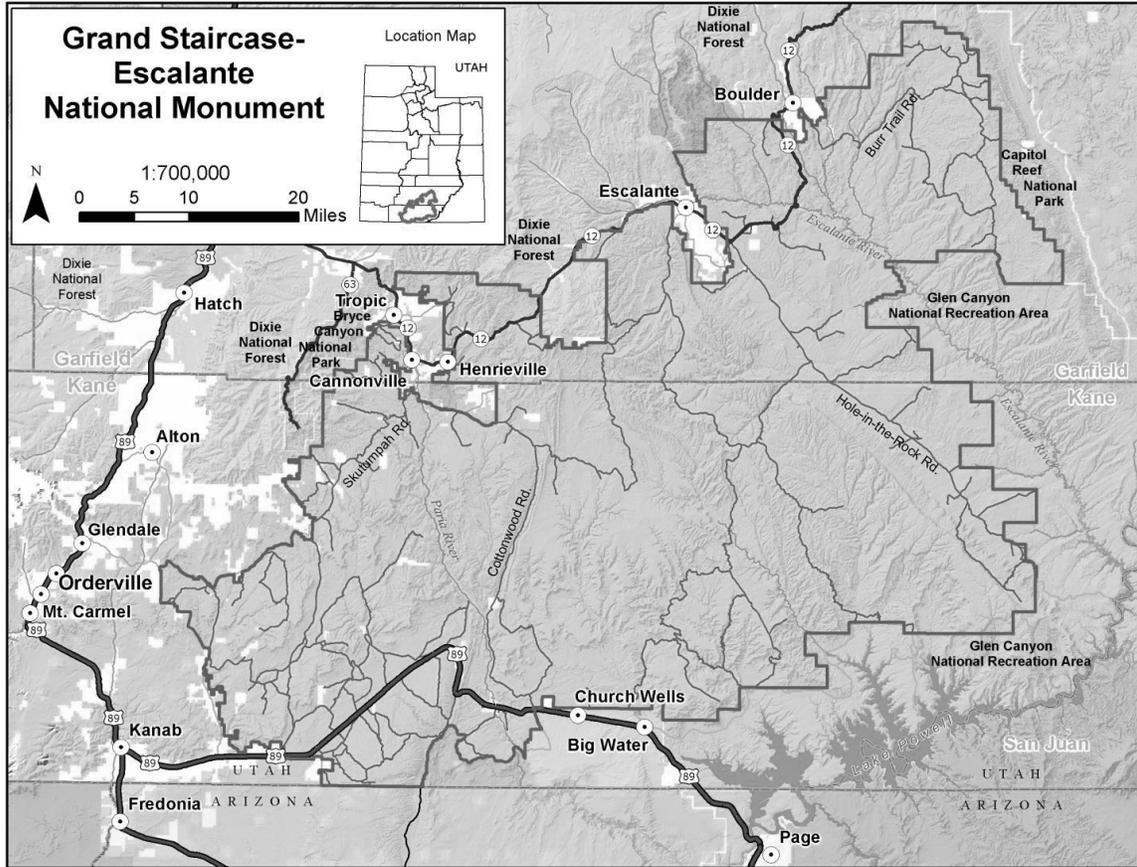
Unit Manager	Phone	E-mail	Mailing Address
Cynthia Staszak	435-644-1240	cstaszak@blm.gov	669 South HWY 89A Kanab, Utah 84741

Field Office	District Office	State Office
N/A	N/A	Utah

Budget

Total FY15 Budget	Subactivity 1711	Other Subactivities' Contributions	Other Funding
\$6,258,579	\$4,258,200	\$960,479	\$1,039,300

Map of Grand Staircase-Escalante National Monument



- | | | | |
|---------------------------------|-----------------------------|-----------------|---------------|
| Bureau of Land Management (BLM) | National Park Service (NPS) | City | US Highway 89 |
| BLM Wilderness Area | Indian Reservation (IR) | GSENM Boundary | State Routes |
| US Forest Service (USFS) | State | County Boundary | Open Road |
| USFS Wilderness Area | State Parks and Recreation | River | |

Managing Partners

N/A

Staffing and Administrative Functions

Grand Staircase-Escalante National Monument is the largest of BLM's National Conservation Lands units, 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 FY15, Monument staff consisted of 48 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.

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

The Monument works with the Kanab Field Office and Arizona Strip District to administer the Paria 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 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 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 RMP

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 four MFPs were replaced by the MMP for all decisions but 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 VRM Class II to Class III. The Utah Greater Sage-Grouse Land Use Plan Amendment provides management for the greater sage-grouse. This includes approximately 5,800 acres identified as a Priority Habitat Management Area.

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). Environmental Management and Planning Solutions Inc. (EMPSi) was hired in September 2013 to write the EIS; the Notice of Intent to initiate the planning effort was published in early FY14. 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 future allotment-specific adjustments. The Environmental Impact Statement will analyze the effects of all alternatives on the Monument's resources. 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. GSENM facilitated nine Cooperating Agency meetings and conducted government-to-government consultation with the Kaibab Band of Paiute Indians.

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, 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, which continued in FY15. Also in 2015, GSENM enlisted Dr. David Cole from the Aldo Leopold Wilderness Research Institute to conduct two workshops on visitor use in the Escalante Canyon region culminating in the report, *Visitor Use Management in the Escalante Canyons Region of Grand Staircase-Escalante National Monument: An Assessment of the Current Situation, Planning Issues and Needs*.

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 NEPA Actions and/or Project Authorizations

GSENM completed 4 environmental assessments, 1 categorical exclusion, and 33 determinations of NEPA adequacy in FY15. GSENM completed a programmatic noxious weed and non-native invasive plant management environmental assessment. This programmatic environmental assessment allows GSENM land managers to implement an integrated weed management program and react quickly to newly discovered weed infestations. Integrated weed management is designed to improve ecosystem health by manipulating vegetation to enhance native plant communities, benefit fish and wildlife habitat, improve riparian and wetland areas, and improve water quality.

Interest in commercial film permits continues to grow at GSENM, with 14 inquiries and 6 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 FY15, the number of Special Recreation Permit (SRP) holders rose from 92 to 101. More than 70 applications have been processed using the *Programmatic Environmental Assessment for*

Issuing Special Recreation Permits within Grand Staircase-Escalante National Monument since it was signed in 2012, including 28 in FY15.

3 Year's Projects and Accomplishments

Fiscal year 2015 was very successful for GSENM, with the continuation and expansion of existing projects, as well as initiation of exciting new projects and initiatives. Monument management and staff are proud to share highlights of these successes.

General Accomplishments

National Landscape Conservation System Branding: GSENM served as a pilot office for the NLCS sign initiative and developed a sign inventory document used as the national model. We installed fifteen new portal signs along frequently travelled highways and roads. The Monument was also included in the BLM vintage poster series of 2015 to celebrate the 15th Anniversary of National Conservation Lands. These posters and other 15th Anniversary materials, were included in many public outreach events during the year.

Left: New Grand Staircase-Escalante National Monument portal sign on Burr Trail.
Right: GSENM vintage poster.

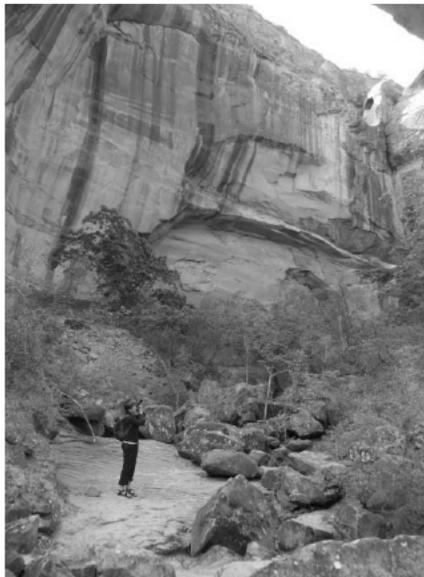
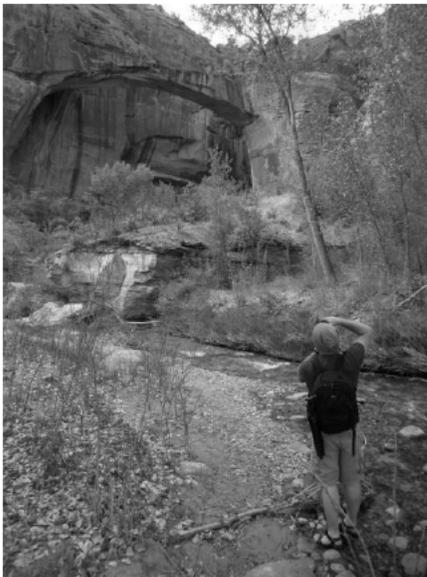


Artist-in-Residence Program: Currently in its fourth year, the GSENM Artist-in-Residence (AiR) program serves as the National Conservation Lands partnership model for hosting an artist in residence with supporting external organizations. Bonnie Griffith, a Meridian, Idaho, based artist served as the 2015 Escalante Canyons Artist-in-Residence.



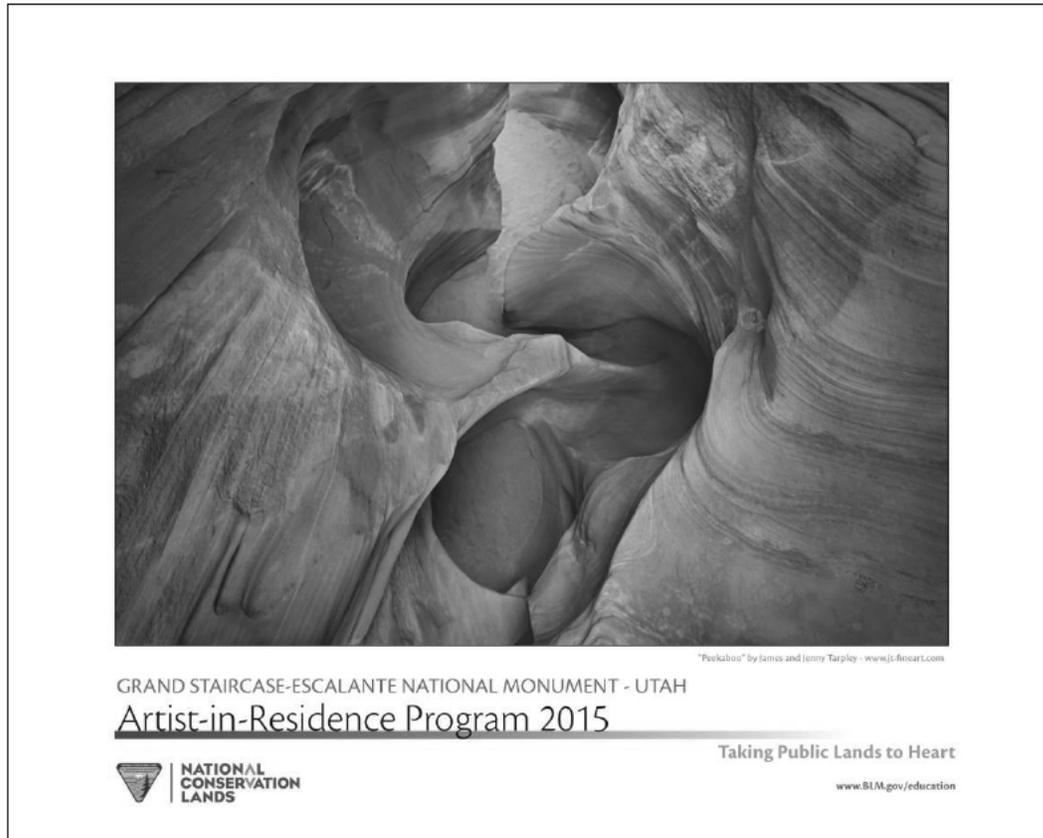
Left: Bonnie Griffith by her work at the Escalante Canyons Art Festival.
Right: View Across Head of the Rocks by Bonnie Griffith.

The GSENM Artist-in-Residence Program expanded to include a photography residency in 2015. The first resident photographers were James and Jenny Tarpley from North Carolina where they have a professional photography business, VISIO Photography. This residency, a partnership effort between GSENM and Kanab's Amazing Earthfest, was hosted for two weeks in mid-May. James and Jenny travelled throughout the Monument during their two weeks here capturing the large and small scale beauty of this place. They shared their accomplishments via public exhibits and a multi-media evening program during the festival.



Above: James (left) and Jenny (right) Tarpley photograph features in Grand Staircase-Escalante National Monument.

An interpretive exhibit was developed featuring posters of the Artist-in-Residences' work and displayed in GSENM Visitor Centers in Big Water, Kanab, Cannonville, and Escalante.



Above: Artist-in-Residence poster featuring James and Jenny Tarplay's work.

Dark Skies Initiative: GSENM continues to build awareness of dark skies as a unique and precious resource. New for 2015, in partnership with a local Page, Arizona astronomy club, GSENM hosted our first Star Party and Solar Eclipse at Big Water Visitor Center for 12 participants. A second Star Party at Big Water Visitor Center grew to 38 participants. Staff from GSENM participated at the International Dark Skies Workshop in Flagstaff, Arizona.

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. Increases in visitation at the Monument's four key visitor centers ranged from 27% to 69% per month. Spring and fall months showed the greatest increases. A new Visitor Centers Manager assumed duties in February 2015.

GSENM Visitor Center 2015	Visitors
Big Water Visitor Center	36,792
Kanab Visitor Center	47,312
Cannonville Visitor Center	36,102
Escalante Visitor Center	64,120

Glen Canyon Natural History Association (GCNHA) operates the Monument retail sales program in four visitor centers and the NHA welcomed their new Executive Director in early August; Karen Dallett who came from the Friends of Red Rock-High Rock organization in Nevada. An annual Aid to Park budget was submitted and \$25,000 granted to go towards a \$45,000 carry-over fund for publishing a new popular paleontology book, highlighting GSENM discoveries, written by Christa Sadler. A publishing contract targets release of the book during the Monument 20th Anniversary events in 2016. Six "Aid to Park" requests were submitted for purchase of a telescope, support for four festivals in surrounding communities, lunches for the annual SRP Outfitter and Guide training and Public Lands Day equipment and supplies.

Recreation Visitation: Approximately 900,000 visitor contacts were made on GSENM including those at the 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 (33,355), Devil's Garden (24,617), Dry Fork Slot Canyons (21,793), Spencer Flat Road (18,288), Burr Trail (73,796), Grosvenor Arch (12,048), Paria Movie Set (12,539) and Toadstools Trailhead (15,643). During Fiscal Year 2015, visitor center and backcountry ranger staff issued a total of 2,934 backcountry and overnight car camping permits for the Escalante Canyons area of BLM and NPS lands. Overnight camping permits are mandatory, but free.

Fee Program: The Fee Program continues to grow as a component of the annual operating budget of GSENM. After initiation of a new business plan in FY14, Calf Creek Recreation Area visitation continues to rise with subsequent parking issues requiring staff to direct traffic on busy weekends and holidays. Calf Creek Recreation Area Recreation Use Permits (RUP) permits for standard amenity day-use numbered 7,208 with 33,355 visitors (13,624 user days) purchasing permits totaling \$33,058; Calf Creek Campground expanded amenity RUP permits numbered

2,030 serving more than 4,686 campers (9,819 user days) totaling \$30,884; and Deer Creek Campground had 497 permits and received 1,175 campers (2,507 user days) totaling \$21,042. The recreation fee program deposited a total of \$84,985 in a dedicated 1232 fee account in 2015.

In 2015, the Monument entered into a written third party agreement with Glen Canyon Natural History Association to sell *America the Beautiful* passes at Monument Visitor Centers. The NHA purchases 100 passes at the beginning of the spring season bringing \$7200 into a dedicated 1232 fee account.

Backcountry Use: Backcountry Rangers responded to multiple incidents of vehicle intrusion in non-motorized areas, identified potential trespass encroachments, and documented cultural resource violations, as well as road and weather issues. At several cultural sites, backcountry rangers also installed new ammo cans containing conservation messaging and welcomed visitors sign their names in a register in an effort to reduce graffiti incidents.

GSENM issued 2,318 backcountry permits for 24,860 visitor use days, and 1,164 car camping permits for 15,480 visitor use days for a total of 3,482 permits and 40,340 visitor use days. GSENM conducted 1,462 backcountry patrols. A total of 4,229 visitors were contacted, 2,704 vehicles were counted, 245 trailheads were serviced, 21 permits were issued in the field, and 1050 campsites were monitored. GSENM installed new trailhead signs at 12 sites on the Monument that included new regulatory information with the updated NLCS style.

Visitor Use Management Research in the Escalante Canyons: Dr. David Cole from the Aldo Leopold Wilderness Research Institute "cadre of experts" program conducted two workshops for a Monument working group focused on the Escalante Canyons to assist in 1) assessing existing monitoring data and summarize what has been learned about visitor use over the past 20 years; 2) consider the need for additional visitor use management; 3) re-visit visitor use related to monitoring to develop a new backcountry monitoring agreement. The first workshop in May of 2015 led participants through a step-by-step process using a recently formulated Interagency Visitor Use Management Framework. The discussion focused on key issues, locations, and identifying desired conditions for resources. Staff worked on resource conditions and indicators at a second workshop in fall 2015 focusing on a new monitoring strategy. A second recreation social scientist, Dr. Kelly Goonan from Southern Utah University, participated in the second workshop. The results of both workshops and interpretation of existing data were compiled in a final report submitted by Dr. David Cole in fall 2015, *Visitor Use Management in the Escalante Canyons Region of Grand Staircase-Escalante National Monument: An Assessment of the Current Situation, Planning Issues and Needs*.

Recreation Experience Baseline Study: Colorado Mesa University's Natural Resource Center and GSENM used a National Conservation Lands science grant and Federal Lands Recreation Enhancement Act (FLREA) fees to support the third 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 3 studied the southern portion of GSENM as well as Vermilion Cliffs

National Monument and Paria Wilderness in the Kanab Field Office. Twelve focus groups in four communities occurred in March, May, and October 2015. Four electronic focus groups occurred in July, August, and September 2015. The results of Phase 2, which focused on the Grand Staircase region, were presented to BLM staff in March. Public presentations of the results were shared at the Cannonville Visitor Center in March and the Kanab Visitor Center in May.

Paria Team: The Paria Team (staff from Vermillion Cliffs National Monument, Kanab Field Office, and GSENM) met monthly in 2015 to discuss issues associated with managing North and South Coyote Buttes (The Wave) and the Paria Canyon-Vermillion Cliffs Wilderness. GSENM has hosted the daily walk-in lottery for the Wave at the Kanab Visitor Center since 2013. In 2015, GSENM participated in the development of a new business plan for the site.

Visual Resources Inventory: Anticipated progress on this project in FY 15 was not achieved due to a lack of a GIS specialist and other staffing needs. Work completed includes converting all data to the VRM data standard, finalizing scenic quality rating unit boundaries, determining distance zones and the seldom seen area, and capturing additional inventory observation point imagery. Finalization of the inventory is anticipated in FY 16.



An example of an inventory observation point panoramic image.

Natural Resource Management Highlights

Rangeland Administration: During 2015 the range program completed monitoring and data collection including utilization, long term trend, Rangeland Health (RLH) assessments, Proper Functioning Condition (PFC) assessments, and Allotment Inventory and Monitoring (AIM) assessments across 34 allotments. In addition, 152 livestock grazing compliance inspections were conducted throughout 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.

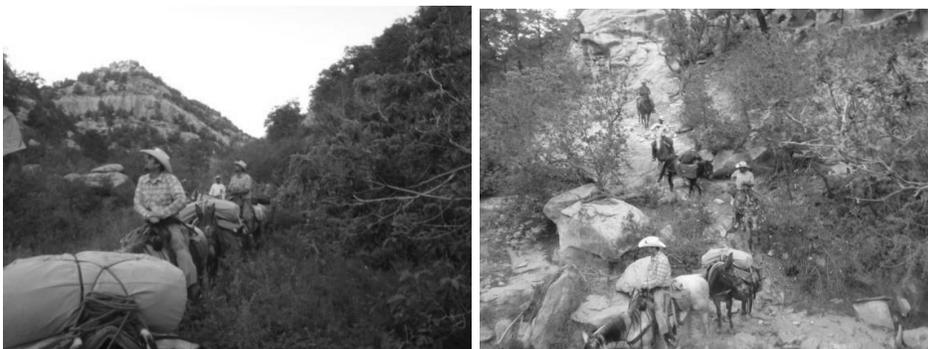
The range program works closely with grazing permittees, as well as the general public, to maintain infrastructure and provide for proper management of the livestock grazing program. Several projects completed in 2015 demonstrate the commitment by grazing permittees and the public to the sustainable management of livestock grazing on GSENM. This includes maintenance and repair of existing improvements such as corrals and fences. Depending on the type of

improvement, BLM and the grazing permittees may coordinate their efforts to accomplish these projects. In 2015, grazing permit holders from several different grazing allotments participated in an effort with BLM staff to eliminate feral livestock from the Steep Creek Drainage. Many areas on the Monument are in rugged canyons where livestock can be difficult to remove. When these situations are discovered BLM Staff work directly with grazing permittees, often including permittees from other allotments, to help remove the cattle. During the 2015 Public Lands Day, seven volunteers worked on a monitoring enclosure near Hole-in-the Rock Road.



Left: Coordinated range improvement work with BLM and grazing permittee rebuilding and maintaining a corral. Center: Grazing permit holders from several different grazing allotments participated with BLM staff to eliminate feral livestock from the Steep Creek Drainage. Right: Public Lands Day volunteers after completing maintenance on rangeland monitoring enclosure.

Fiftymile Mountain Research Project: During summer 2015 a Monument Interdisciplinary Team conducted vegetation monitoring and cultural resource inventory on Fiftymile Mountain. The project was supported by staff and horses from the Dixie National Forest, BLM-Arizona Strip District Fire and Aviation, BLM-Kanab Field Office, and GSENM.



Left: Natural resource staff staff packing in archaeological gear and equipment while doing visual surveys along the trail. Right: Natural resource staff traversing the trail to the Fiftymile Mountain project sites.

While on Fiftymile Mountain natural resource staff completed Proper Functioning Condition (PFC) monitoring on several key areas and conducted Riparian Functioning Condition Assessments at five lentic sites. The assessments demonstrated an improvement of riparian conditions between

2002 to 2015, the result of intensive livestock management activities that had occurred on the Rock Creek/Mudholes Allotment. As an example of the improvement, in 2002 the riparian rating for the Pocket Hollow Spring was “Functioning at Risk” with a downward trend. The rating for the 2015 assessment was “Proper Functioning Condition”, a dramatic improvement in vegetative ground cover throughout this site.



Fiftymile Mountain, Pocket Hollow Spring in 2002 (L) and in 2015 (R).

Hummingbird and Bat Studies: The Monument continued long-term studies of bats and hummingbirds. During 2015 GSENM monitored bats in locations ranging from just over 4,000 feet elevation to 10,000 feet, which resulted in catching 15 out of the 18 known species from Utah.

In addition to noting species, weight, and key measurements on the hummingbirds, staff scientists study plant species utilized by these birds. Fiscal year 2015 was the sixth season for hummingbird monitoring and pollen collection working, with the Hummingbird Monitoring Network. Pollen swabs show the variety of plants visited by hummingbirds, including golden current and other native species critical for pollinators. Totals for the life of the project are 5,383 hummingbirds captured and 4,495 hummingbirds banded. This year hummingbirds were also banded as part of a local Paiute youth camp.



Photos taken during the hummingbird study.

Wildlife Habitat Improvement and Monitoring Projects: Monument resource staff completed several wildlife water projects during 2015, leading to improved species distribution and alleviating impacts to key areas and critical natural waters. Projects include installation of lids on three large water storage tanks. These tanks are often the only water source for miles, and wildlife are drawn to them, resulting in entrapment and mortality. The lids also help control water evaporation. Using donated funds from the Sportsmen for Fish and Wildlife lids were manufactured and placed over the Eightmile, West Clark Bench, and Alstrom Point storage tanks.



Left: Open water storage tank. Center: Recently installed tank lid to protect wildlife and conserve water. Right: Canyon treefrog found on GSENM in FY15.

Monument wildlife staff completed additional inventory on reptiles and amphibians in 2015. Ten different reptile species were recorded and new locations were found for the canyon treefrog (*Hyla arenicolor*), a species overlooked in previously published surveys. GSENM wildlife staff also assisted the Utah Department of Wildlife Resources this year with midwinter bald eagle surveys, the annual bat blitz, peregrine surveys, Colorado cutthroat trout spawning, breeding bird surveys, and mountain goat roundups.

Riparian Restoration: Willow and cottonwood cuttings were planted in springtime along Birch Creek and Henrieville Creek to augment natural recruitment and promote floodplain restoration. Approximately, 1,000 willow and cottonwood cuttings were planted at both sites. These restoration efforts are demonstrating great success with a high survival rate of the transplants and stream morphological benefits, as well as improved riparian habitat.



Left and Center: Freshly planted willow and cottonwood cuttings along Birch and Henrieville Creeks. Right: Monitoring riparian corridors in 2015; willow recruitment success along floodplain in Horse Canyon.

Seeds of Success: Precipitation amount and timing during early FY2015 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 three researchers inventoried and collected locally-sourced seed from GSENM to be used on Monument restoration projects.



Left: 2015 was a great year for native plants ; Kodachrome Bladderpod (*Lesquerella tumulosa*) . Center: Crew from the Chicago Botanic Garden. Right: Inventory and seed collection

Eightmile Salinity Control Project: Over the past three years Monument staff have worked to restore Eightmile Pond, a large salinity collection structure. Several of these 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. Work in FY16 will be completed at Eightmile Pond, and project work will continue at other structures.



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

Vegetation Restoration Forum: Sponsored by BLM, this well-attended public forum in Kanab on the science, purpose, and methodologies of vegetation restoration included a panel discussion on restoration on Tuesday, August 18, and a field trip to look at restoration sites on Wednesday, August 19.

Participants in panel included Hal Gordon, Economist, Natural Resources Conservation Service (NRCS); Shane Green, Rangeland Management Specialist, NRCS; Mary O'Brien, Utah Forests Program Director, Grand Canyon Trust; Adrienne Pilmanis, Botanist, BLM; Karen Prentice, Healthy Lands Initiative Coordinator, BLM; Bruce Roundy, Plant and Wildlife Sciences Faculty, Brigham Young University; and Jason Vernon, Habitat Restoration Coordinator, Utah Division of Wildlife Resources.

Wednesday's field trip included panel members as well as interested public to look at GSENM and Kanab Field Office restoration sites: the Five Mile Sagebrush Restoration Project, restoration work along Skutumpah Road and Thompson Creek, and along the Coal Road to look at five different years of restoration efforts.



Public field trip during the BLM vegetation restoration forum, visiting active restoration projects on BLM Lands.

Non-renewable Resource Management Highlights

Cultural Resource Inventory and Monitoring: Efforts in 2015 were largely conducted in support of the ongoing Livestock Grazing Plan Amendment EIS and the upcoming allotment-specific EAs for permit renewal. These 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 2015 resulted in more than 700 acres being covered and documentation of 28 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 archaeologists from Colorado Plateau Archaeological Alliance (CPAA), while smaller, NHPA Section 106 compliance efforts were accomplished in-house.

A major part of this effort documented and described grazing-related impacts, necessary for analysis associated with the ongoing GSENM Grazing Plan Amendment EIS. FY2015 efforts were the culmination of similar efforts that began in 2012. Archeologists updated records, especially at sites where grazing impacts had been previously documented. These data, combined with those collected from previously undocumented sites, shows a complex picture of grazing-related impacts in certain locations, and lack thereof in other locations. Initial analysis of the data indicated potential for such impacts is influenced by more than just numbers of livestock. Equally important factors appear to include vegetative cover, season of use, slope, aspect, and perhaps most importantly, soil type and stability. Results of this investigation will be factored into the ongoing EIS analysis, and will be important to future allotment-specific permit renewal EAs. This work may be applicable to future grazing management efforts at other BLM offices across the southwest.

Site stabilization efforts continued at historic Watson Cabin in Hackberry Canyon. Work in 2015 included cutting and hauling timbers for roof beams (accomplished with horses hauling the logs), completion of the period-correct livestock enclosure fence and, re-routing precipitation run-off to avoid the cabin. This project will be completed summer of 2016. Other repair and stabilization efforts were required at rock art sites along the Escalante River, where charcoal graffiti was applied to two important and popular sites. Clean-up efforts at one site were relatively simple, but the second site requires detailed and careful work, and is proceeding in stages to avoid inadvertent damage to the site. There appears to be a significant increase in vandalism to rock art sites in 2015 over past years. It may be associated with spring break for nearby universities. Repair and/or cleaning efforts are ongoing at these sites as well.



Work proceeds at the historic Frank Watson cabin.

Research efforts for the GSENM Pollen Core study continue. A pollen core analysis was completed, and reported in a Master's Thesis by Robert D'Andrea, a graduate student from Northern Arizona University (NAU). The completed report documents and details environmental changes at GSENM over the past 7,900 years, based on pollen cores recovered from two locations in 2012. This is a significant contribution to our understanding of that time period in this region, and will be applicable to a wider Colorado Plateau area. Findings provide a detailed fire history, including how the natural fire regime was influenced by Native American burning practices, how aboriginal agricultural practices are reflected in vegetational changes, and how the introduction of livestock in the late 1800s is reflected in both vegetational changes and increased sedimentation rates. Archaeological inventories associated with these two pollen core locations are complete, and reports are in progress.

Paleontological Inventory and Monitoring: Both the Natural History Museum of Utah (NHMU) and the Denver Museum of Nature and Science (DMNS) were funded to carry out inventory and collect important vertebrate fossils. The NHMU surveyed approximately 1515 acres of Wahweap and Kaiparowits Formation outcrops and intensively studied/collected 8 sites in spring, summer, and fall 2015. A total of 63 new sites were documented. The DMNS inventoried 6610 acres, in both the Kaiparowits and Wahweap formations, with spectacular results. A total of 85 new sites were documented. A total of 5 sites were intensively collected/documentated by DMNS during the same period. DMNS found a new tyrannosaur site with multiple elements of a full size adult at the surface as well as the smallest juvenile horned dinosaur ever found in GSENM. The NHMU found a new ceratopsid site that appears to be a third individual of *cf. Pentaceratops*.

BLM and Grand Staircase-Escalante Partners staff and volunteers logged a total of 72 person-days (one person working a standard 8-hour day) and finished 1835 acres of on-the-ground inventory

during FY 2015. That is a 329 acre (18%) and 19 person/day (27%) increase from FY2014. A total of 100 new sites were recorded by GSENM's paleontology program. This is a 56-site increase (96%) from FY2014. The BLM GSENM in-house program found another tyrannosaur site (15UTKA-23) that has the remains of a medium-size, partly articulated individual as well as a totally complete *Parasaurolophus* skull, a partly articulated raptor pelvis, and two rare, nearly complete articulated turtle specimens. For the next five years, priorities for inventory and research will change slightly from recommendations in the 2014 report, with the Kaiparowits Formation receiving 70% (more) of the non-section 106 inventory effort. Other formations, particularly the Wahweap, and Tropic formations, will share remaining time and resources.



Complete *Parasaurolophus* skull found in FY2015. Right side is exposed, with the complete curved crest on the left and the nasal area at the right. Tight curvature of crest indicates it is a juvenile.

A total of 126 person-days were committed to intensive collection and data recording of 20 important fossil sites by the program's paid staff. This is a 17% increase over time spent on similar work in 2014 (108). This was largely a result of the massive effort put forth at 14UTKA-8 (Alan's Rainbows and Unicorns Tyrannosaur Quarry) which alone accounted for 59 of the 108 person-days. Work on these sites was also done by paid staff of the Natural History Museum of Utah and dozens of volunteers, bringing the total number of person-days spent on excavation to 230. One additional project was conducted, writing of a manuscript to summarize five years of paleomagnetic stratigraphy work done with Dr. Barry Albright of the University of North Florida. A completed manuscript was submitted to the peer reviewed scientific journal "Cretaceous Research" at the end of November, 2015 (early FY2016) and accepted for publication in January

2016. The NHMU and the DMNS excavated numerous additional sites, the details of which can be found in their annual reports, available on file at GSENM HQ and the BLM Utah State Office.



Monument paleontologist and Snow College geology students mapping dinosaur fossils at an excavation site, April, 2015.

A total of 50 sites were monitored in FY2015. Recovery of excavated sites is on target and most non-excavation sites are in good condition. Baseline resource surveys for the Wolverine, Escalante, and Seaman Wash petrified wood areas are an ongoing need.

Current Areas of Focus

Grand Staircase-Escalante National Monument addressed several pressing issues in FY15, including Monument staff changes and reductions, increasing recreational demands and visitation, continuing work on and interest in our Livestock Grazing Monument Management Plan Amendment and associated Environmental Impact Statement, and on-going litigation associated with Revised Statute 2477 (RS2477) right of way issues. These issues were a major focus of staff activities in FY2015 and will continue to occupy staff and impact the Monument's work into the future.

Staff Changes and Reductions: GSENM experienced a number of staffing changes during FY15. Cindy Staszak completed her first year as the Monument Manager. Craig Tanner became the Supervisory Park Ranger/ Visitor Centers Manager working from the Escalante office. Sarah Schlanger left her position as Associate Monument Manager to become the Taos Field Manager in July 2015. Other key vacancies included the Soil Scientist, Facilities Operations Manager, two Law Enforcement Rangers, Geographic Information System Specialist, and Planning and Environmental Coordinator. Progress was made toward filling those key positions; GSENM hopes to have new staff in place mid-FY16. During FY16, GSENM will continue to address staffing reductions through workforce planning, budget analysis, sharing resources, increasing volunteer opportunities, prioritizing workloads and determining what we will be unable to accomplish with limited staff. GSENM uses a variety of hiring authorities and outreach mechanisms to bring new staff to the Monument.

Increasing recreational demands and visitation: GSENM experienced another record year for visitation, with approximately 900,000 total visitors, and 184,326 visitors in our Visitor Centers. The number of Special Recreation Permits continues to increase year over year with 92 in FY 14, and 101 in FY15. Several actions were completed in FY 15 to meet the demands that come with increased visitation. The Monument initiated design and compliance work on a series recreation projects submitted for deferred maintenance. Several highly visited locations will receive upgrades over the next three years including Calf Creek Campground, Deer Creek Campground, White House Campground, and Dry Fork Trailhead. Additionally, in FY2015 environmental compliance and improved design of the Dance Hall Rock parking area was completed in consultation with the Church of Jesus Christ of Latter-day Saints and supported through a grant with Utah State Parks. The Recreation Experience Baseline study focused on the Highway 89/Paria region in 2015, address the Burr Trail in 2016, and will finalize fieldwork in 2017. Several new initiatives were launched including a visitor use planning assessment for the Escalante Canyons, initiation of the Monument Dark Skies program, and continuation of the acoustic monitoring baseline study with Southern Utah University.

Livestock Grazing Monument Management Plan Amendment/Associated Environmental Impact Statement (MMP-A/EIS): GSENM is continuing work on the Livestock Grazing Monument Management Plan Amendment and associated EIS. We are addressing issues raised with this controversial EIS by increasing our engagement and transparency with cooperators and the public. We have conducted three scoping meetings, three socioeconomic workshops, four rangeland monitoring workshops, a Biological Soil Crust Science Forum and two Colorado Plateau Rapid Eco-regional Assessment presentations. GSENM held monthly Cooperating

Agency meetings, attended coordination meetings with Kane and Garfield counties, and met with State of Utah representatives, the National Park Service at Glen Canyon National Recreation Area, the Grand Canyon Trust, The Wilderness Society, Western Watersheds Project and Wild Utah. GSENM also conducted government-to-government consultation with the Kaibab Band of Paiute Indians. The goal for the current MMP-A/EIS is to develop and analyze management alternatives and reach a decision that will enable sustained yield of the land through improved land health and science-based grazing management. GSENM released preliminary alternatives to the public to foster continued public involvement. We will continue this elevated level of engagement and outreach in FY16, involving the public in commenting on the range of alternatives developed for the Draft EIS.

Litigation & FOIA: On-going litigation dealing with Revised Statute 2477 (RS2477) rights-of-ways and a dramatic increase in FOIAs have created a tremendous workload for Monument staff and is impacting the time available for inventory, monitoring and managing the resources. RS2477 cases involve more than 1,500 roads across the Monument and the Kanab Field Office in Kane and Garfield Counties. The decision in the first case (Kane 1), adjudicating just 15 roads, was signed by the judge in spring 2013 and was soon appealed by both parties. A decision was issued and published by the United States Court of Appeals, Tenth Circuit on December 2, 2014. The appeal was affirmed in part, reversed in part, and remanded. Kane 2 (64 roads), Kane 3 (706 roads), Garfield 1 (96 roads) and Garfield 2 (640 roads) have yet to be heard in court. At least five formal FOIA requests and several dozen informal requests for information or data were received in 2015. With limited staff and multiple critical priorities, these requests severely limit the time available for inventory, monitoring and managing the Monument resources.

Education, Outreach, and Interpretation

Environmental Educational (Youth)

Native Plant Restoration Project: Grand Staircase-Escalante National Monument (GSENM) continued the Native Plant Restoration Project at Old Corral Spring in partnership with Grand Staircase Escalante Partners (GSEP), Glen Canyon Natural History Association (GCNHA), Youth Conservation Corps (YCC), Kaibab Paiute Band of Indians (KPBI), Paiute Tribe of Utah (PTU), Utah and Arizona Workforce Services (WFS), and Southern Utah University Intergovernmental Internship Cooperative (IIC). 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).



Paiute Youth Conservation Corps (YCC) crew members work with other YCC crews at the GSENM Cannonville Visitor Center grounds.

Mentored by GSENM specialists, IIC recruited six Native Americans as members of a Youth Conservation Corps work-crew for 2 weeks of work. At the Old Corral Spring test site, the crew repaired flood damage to an enclosure fence, re-treated previously treated tamarisk, and constructed a diversion dam to help prevent soil erosion. In addition, the crew planted test plots of experimental native plant seedlings, chosen by Paiute tribal elders to increase available resources for medicines and materials traditional uses.

Title I Native American, Underserved, & Rural Disadvantaged Youth Engagement, Education, & Employment Program: This program was funded by an Executive Order Program (EOP) Projects for Workforce Diversity grant, BLM Utah State Office Marque Youth Program funding, and GSENM base funding. Through an assistance agreement with Southern Utah University Intergovernmental Internship Cooperative (IIC), GSENM was able to interconnect and expand existing natural and cultural resource education and employment efforts, creating a progressively more engaging set of opportunities for Native American and other Title I & VII underserved youth throughout Southern Utah and Northern Arizona. The program was designed around the concept that the seeds of good land stewardship are best nurtured by establishing and maintaining positive relationships with youth as they grow into maturity. To do this, IIC and their partners have developed a stair-step approach to engage, enlighten, enlist, and employ regional youth from kindergarten through graduate school.

- Step One: Engage youth in meaningful natural and cultural resource educational activities that help them learn about, participate in, and better understand public land management. GSENM and GSEP developed Frontier Science School to help meet this objective.
- Step 2: Recruit Native American, Title I underserved youth, and veteran students for YCC and Career Internship Corps (CIC) and/or mentored internships with an emphasis on encouraging participants to explore careers in public land management.
- Step 3: Foster leadership skills in Native American and Title I underserved youth for YCC and CIC and/or mentored internship participants by encouraging qualified youth to become crew leaders and/or mentors to other program participants.
- Step 4: Provide Native American, Title I underserved, and veteran students, pursuing careers in public land management, the encouragement and assistance they need to qualify and apply for public land agencies entry level positions. As part of this collaboration, IIC encouraged and assisted students interested in agency careers to apply for the Pathways or Direct Hire programs. These internships are career-building opportunities which can springboard students into a career with BLM.

By supporting this program, BLM has increased the number and diversity of well-qualified career candidates from which the agency may recruit. Due to the well-organized mentoring and training programs provided by both IIC in partnership with BLM, candidates are better prepared for entry into the BLM workforce and are more likely to remain in government service.

Under this program umbrella, GSENM helped support GSEP's Frontier Science School programs and Paiute Camp Kwiyaumntsi. In addition, GSENM sponsored: 6 youth as Career Internship Corps crew members repairing trails at Calf Creek Recreation Area; 2 student interns design and deploy

program outreach materials specifically targeting Native American and Title I underserved youth; 6 scholarships in support of public land management related fields of study; 6 scholarships for youth to participate in STEM-based natural resource and cultural heritage camps; 5 internships with Color Country District and Arizona Strip District, and 4 internships with GSENM. Special emphasis was provided to recruit Native American and underserved veteran students in the recruitment process. All youth involved participated in training and education opportunities.

Frontier Science School (FSS): In cooperation with GSENM, KFO, and IIC, Grand Staircase Escalante Partners (GSEP) Education Coordinator Jeff Muse created a pilot educational program called Frontier Science School and companion website:

<http://www.frontierscienceschool.org/>). This

program provides regional educators (elementary to high school) opportunities to collaborate with agency staff in the development of Science Technology Engineering Math (STEM) and Play Learn Serve Work (PLSW)- based natural and cultural resource related hands-on learning activities.

They are disseminated via classroom visits, school assembly presentations, field excursions, and summer camps, and/or sponsored programs (i.e. 4H, Future Farmers, Girls Scouts, Boy Scouts, Native American youth camps). In working with teachers to develop lesson plans, 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.



FSS Escalante High School students study micro invertebrates during a Frontier Science School fieldtrip to the Escalante River in April.

Every Kid in a Park: In fiscal year 2015, GSENM and GSEP staff provided 83 presentations or conducted fieldtrips for 1716 students as part of the FSS program. In addition, GSEP, in cooperation with GSENM, launched the Every Kid in a Park (EKIP) initiative by presenting 4 public lands lessons to 85 regional fourth-grade classes; and created a new webpage to promote Every Kid in a Park on the Frontier Science School website: <http://www.frontierscienceschool.org/every-kid-in-a-park/>. Staff utilized the Paleontology and Archaeology Discovery Trunks for some presentations.

Kwiyamunsi 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, GSENM sponsored the Camp Kwiyamunsi Event for regional Paiute Youth. GSENM staff gave 5 formal presentations to 25 participants. In an effort to encourage leadership potential in crew members and additional tribal youth participation in BLM-sponsored

youth-based education and employment programs, Paiute Youth Conservation Corps crew members also served as camp mentors to other tribal youth.

Junior Explorer Program: GSENM issued 111 badges to youth who completed the activity guide for the Junior (Scientist) Explorer program.

Public Outreach



As part of the 2015 Audubon Christmas Bird Count Event, Martin Tyner and his golden eagle "Scout" of the Southwest Wildlife Foundation talked to Kanab Elementary students about raptors.

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, Pipe Spring NM, 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, GSENM Biologist Terry Tolbert 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.

As part of the CBC event, GSENM and KFO sponsored 5 live raptor presentations given by Martin Tyner of the Southwest Wildlife Foundation to (1051) students during assemblies in the Kanab, Fredonia, Valley, Bryce Valley, and Escalante elementary Schools. Tyner also provided 2 additional evening programs for 180 people in Escalante and Kanab. Further, GSENM and KFO sponsored 3 CBC events located at the Escalante Interagency Visitor Center, Boulder Anasazi State Park, and Kanab BLM Headquarters drawing almost 200 regional residents who counted birds. A poster and news release announced the event, and participants received an event t-shirt for their participation.

Public Lands Day: On September 12, 2015, twelve people participated in two backcountry WSA Public Lands Day (PLD) projects at the Boulder Mail trailhead (Phipps-Death Hollow WSA) and at Willis Creek (Paria-Hackberry WSA). Each group had six volunteers. Hikers in one group removed graffiti in the mud walls of Willis Creek, broke up fire rings, removed trash at campsites and installed a trip log in an ammo can to prevent graffiti. The second group installed a basket cairn, broke up large fire rings and rehabilitated a vehicle ingress route at a cross-country point for

vehicles on McGath Bench Road. Another group of seven people participated with range program staff to maintain a range monitoring enclosure. Each group received free PLD t-shirts. Refreshments were provided by Glen Canyon Natural History Association.

Timeless Traditions of the Southern Paiutes (Paiute Days): GSENM in partnership with the Kanab Field Office, Grand Staircase Escalante Partners (GSEP), Southern Utah University Intergovernmental Internship Cooperative, and Glen Canyon Natural History Association, sponsored a special cultural education event at the GSENM Cannonville Visitor Center as part of GSEP's Frontier Science School for all of IIC's Youth Conservation Corps (YCC) crews and visitors. Tribal elders, GSEP, and BLM staff provided hands-on natural resource management and plant identification learning activities and presentations to help 45 participants learn about Native Americans utilization and management of traditional native plants. As part of the event, YCC crews performed maintenance on the visitor center grounds and gardens. GSENM Staff created a poster advertising the event and a handout on plant coppicing techniques.



Traditional Paiute dwelling called a Kahn built by the Paiute Youth Conservation Corps crew for the *Timeless Traditions of the Southern Paiutes* (Paiute Days) Event.

Local and Regional Event Support: GSENM sponsored booths at events including Balloons & Tunes Festival drawing 300 participants; Earth Day Festival and poster contest for local students drawing over 600 participants; a National Public Lands Day Event for 12 participants; Western Legends Round-Up Festival drawing 700 participants; Escalante Canyons Art Festival/ Everett Rues Days attracting 500 people; Bryce Canyon National Park Geology Festival drawing 500 participants; and Get Outside Day Event drawing 150 people.

Walks and Talks Lecture Series and Other Presentations: GSENM resource specialists, researchers, and guest lecturers provided 76 formal presentations and fieldtrips, including 10 Walks & Talks Lectures on paleontology, archaeology, range, wildlife, and stewardship at GSENM visitor centers, campgrounds, professional meetings, workshops, seminars, and trainings for 2332 participants. In addition, Visitor Services staff provided 112 formal and informal ranger-led walks or talks to 2,143 visitors, educational tours, and organized groups at GSENM Visitor Centers, Calf Creek Campground, and Utah Escalante Petrified Forest State Park.

Native Plant Restoration Project: The Monument has a long standing association with Kanab High School. For six years GSENM's Hands-on-the-Land (HOL)/ Take-it-Outside (TIO) initiative has sponsored a field trip for Kanab High School (KHS) Natural Resources students (28 students in 2015). The students participate in local native seed collection, germinate the seed in the high school greenhouse, and transplant seedlings to a restoration location on GSENM. The class returns each year to monitor the survival rate of the seedlings. Students learned how to establish

frequency transects, identify native plants, and document Sage Grouse occupancy. This project was highlighted by PBS's "This American Land" series in 2014
[http://www.thisamericanland.org/lesson-plans/restoring-native-plants.](http://www.thisamericanland.org/lesson-plans/restoring-native-plants)



Kanab High School class monitoring the GSENM Native Seed Plot which the students established six years before.

Interpretive and Program Support Media: In fiscal year 2015, GSENM produced more than 50 information signs, interpretive panels, posters, news releases, support publications, and a new exhibit for the Big Water Visitor Center featuring baby ceratops fossils. In addition, ten 20-minute radio shows about GSENM programs and goals were broadcast in Page, Arizona to a radio audience that included the Navajo Reservation and southern Utah. More than 13 news releases were generated for events and Walks and Talks Presentations.

Twelve new trailhead signs including regulatory information incorporating the new NLCS brand template were created as part of the "roll-out" of the new look. Signs were written by a team of Recreation, Visitor Services, and law enforcement staff, they were installed at key recreation trailheads on GSENM including: Dry Fork Slot Canyons, Hurricane Wash, Harris Wash, Egypt, Upper Calf Creek Falls, Lower Calf Creek Falls, Paria-Hackberry Canyon, Deer Creek, Boulder Mail Trail and Nephi Pasture.

Traveling Exhibits: GSENM, Kanab Field Office, and Grand Staircase Escalante Partners featured traveling exhibits at several regional school assemblies, public outreach events, visitor centers, and public venues. 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. The exhibits were also loaned to Kane County for exhibition at their administrative and Travel Council offices and the President William Clinton Library in Little Rock, Arkansas.



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 Building in Washington DC.

Partnerships

The Monument's extensive research, outreach, and educational programs were supported by more than 50 active partnerships in FY15. These included the Monument's non-profit friends groups, Grand Staircase Escalante Partners, 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.

Grand Staircase Escalante Partners (GSEP): Grand Staircase Escalante Partners (GSEP), a 501(c)(3) non-profit friends group was incorporated in 2004 and at the GSENM Manager's request began working closely on projects with the Monument in 2006. In FY15, major accomplishments included a renewed focus on the four key programs that GSEP manages with assistance from the Monument staff. For example, using language from the Monument's 1996 Proclamation, GSEP successfully developed a new branding and marketing tool for the education program called the *Frontier Science School*. The GSEP education, site steward, and paleo programs are supported for the most part through a BLM Financial Assistance Agreement. In FY2015 GSEP was able to raise an additional \$52,894 to enhance each of these three particular programs. Over 4,600 hours of GSEP volunteer time were recorded in these endeavors. The Partners' four primary programs that help connect the local residents and visiting public to GSENM:

- ***Frontier Science School***, which provides STEM-oriented, curriculum-based activities to underserved schools and rural communities around the Monument, as well as the rapidly increasing number of national and international tourists drawn to southern Utah;
- ***Site Stewards***, in which 27 volunteers monitor over 90 archeological sites vulnerable to natural erosion, looting and insensitive visitation;
- ***Paleontology Laboratory and Outreach Program***, in which the GSEP paleontologist and up to 18 "citizen science" volunteers aid scientists working in GSENM with the discovery, research, and preparation of diverse fossils, including dinosaurs;
- and the ***Escalante River Watershed Partnership***, a collaboration among private and public stakeholders to eradicate invasive woody species along one of the West's most iconic rivers. In seven years, more than 4,750 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. GSEP obtained \$1,042,443 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 received an additional \$18,832 in donations and fee-for-service for this restoration program. Approximately 4% of the funds used by GSEP for this restoration is direct dollars from three Federal agencies (BLM, USFS, NPS), with the agencies do contributing significant in-kind services. At the end of 2015, 71 miles of Escalante Main-stem plus tributaries are clear of Russian-olive, leaving only 19 river miles left to be completed by November 2018.

Southern Utah University, Department of Psychology: Natural sounds are an identified GSENM resource of scientific interest that have a strong tie to recreation, visitor experience and wilderness study area (WSA) resources. GSENM initiated a research project for collection and analysis of acoustic data in 2013. Southern Utah University (SUU) conducted a second phase of baseline acoustic monitoring in 2015 at eight locations to continue to identify soundscape conditions and develop a better understanding of how natural sound and noise affect visitor experience and monument resources. Several sites in GSENM have been found to have exceedingly low decibel levels based on preliminary data analysis, and potentially some of the quietest locations in the United States. More than 16,000 hours of sound data have been collected to date.



Dry Fork acoustic monitoring station equipment includes a microphone, digital recorder, sound pressure level (dB) meter, a weather station, and batteries.

Escalante River Watershed Partnership (ERWP): The ERWP, created in 2009 to bring together efforts to control Russian olive, monitor the spread and effects of the tamarisk leaf beetle, and improve management of resource use of the Escalante River watershed, has over 30 partners, including local landowners, business owners, city and county municipalities, non-profit organizations, conservation corps, and federal and state land agencies. The ERWP aims to restore and maintain the natural ecological conditions of the Escalante River and its watershed, and involve local communities in promoting and implementing sustainable land and water use practices. ERWP uses the best available science, community input and adaptive management methods to make sound decisions.

Great Basin Institute and AIM Implementation: In FY15, GSENM extended its long-term collaboration with the Great Basin Institute (GBI) to implement the Bureau's Assessment, Inventory, and Monitoring (AIM) protocol on the Monument. A three-person GBI crew located and initiated 21 new monitoring locations across the monument. The stratified sampling design focused on ecological sites critical to ecosystem function on the Monument.

Glen Canyon Natural History Association (GCNHA): GSENM continued its strong partnership with GCNHA. This group works with the Monument to operate the retail sales program of thematic book and gift shops in our four visitor centers. They collaborate with GSENM to provide with temporary and seasonal staffing needs at these visitor centers. Six hosted workers in FY15 were hired to staff information desks at the visitor centers.

Utah Scenic Byway 12 Foundation: The Monument continued its close association with the Utah Scenic Byway 12 Foundation. FY15 marked a new high for tourism numbers on Scenic Byway 12. A special byway meeting held in August gave local citizens and partners a chance to comment on the increasing challenges of local communities to provide adequate services to a growing number of visitors. The Scenic Byway 12 Committee resolved to meet with local governments in 2016 for the purpose of identifying opportunities for the byway committee to support byway communities and local government plans to respond to increasing visitation.

Colorado Mesa University, Natural Resources Center: Colorado Mesa University's Natural Resource Center and GSENM used a National Conservation Lands Science grant and Federal Lands Recreation Enhancement Act fees to support the third phase of a multi-year study aimed at helping BLM better respond to the public's desires and expectations for how recreation on the Monument is managed. In 2015, Phase 4 studied the southern portion of the GSENM as well as the Vermillion Cliffs National Monument and the Paria Wilderness in the Kanab Field Office. Twelve focus groups in four communities occurred in March, May, and October 2015. Four electronic focus groups occurred in July, August, and September 2015.

Aldo Leopold Wilderness Research Institute/Rocky Mountain Research Station, US Forest Service: A new interagency agreement was established under Service First Agreement Authority to analyze existing visitor capacity in the Calf Creek watershed and the Dry Fork slot canyons and make recommendation for future visitor use monitoring and analysis.

SUU-IIC Partnership: Administered by Southern Utah University's (SUU) Outdoor Engagement Center, the Intergovernmental Internship Cooperative (IIC) coordinates work and project-based internship and service learning projects to serve southern Utah and northern Arizona by matching the needs of state and federal land and resource management agencies with University students, educators, and young people seeking meaningful land management and education opportunities.

Volunteers

The Monument sponsored 258 volunteers and 27 hosted workers in FY15. These volunteers and hosted workers performed a total of 32,375 duty hours to support our programs, with a monetary value of \$705,193. Volunteers were recruited and managed through several Monument programs, including our Site Steward heritage stewardship initiative, watershed restoration work, and the paleontology laboratory. Several volunteer organizations donated time and effort for a variety of Monument projects: Escalante River Watershed Partnership (440 hrs), Great Old Broads for Wilderness (390 hrs), and Grand Staircase Escalante Partners (20,300 hrs).

There were nine people who volunteered as Campground Hosts (3,110 hrs) at Calf Creek Campground and Day Use Area. The GSENM camp host program provided oversight throughout the summer Calf Creek campground, the Monument's busiest recreation site. The Escalante River Watershed partnership (ERWP) also continues in collaboration with Grand Staircase Escalante Partners, our non-profit friends group. The ERWP organized several volunteer activities in 2015.

Land (or Interests in Land) Acquisitions

No lands were acquired in FY15.

4 Science

Science

Moving Bureau-wide Science Initiatives Forward

GSENM sits in a large tract 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 FY15, GSENM worked with Great Basin Institute project leaders and field crews to establish an additional 21 Assessment, Inventory, and Monitoring (AIM) stations on the Monument and worked with the National Operations Center and with the Utah State Office to incorporate the Colorado Plateau Rapid Ecoregional Assessment (REA) findings and toolkit for Monument planning purposes.

Current Science Projects

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Archaeological Inventory and Monitoring (part of Assistance Agreement L11AC20222: NLCS GSENM Archaeological Assessment Project)	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 in preparation	\$28,000
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.	archaeology, paleoenvironments, palynology, botany, climate change	Jerry Spangler, Colorado Plateau Archaeological Alliance	Report in preparation (NOTE: funds for this project lumped with those for "Archaeological Inventory and Monitoring" same Assistance Agreement)	\$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, paleoenvironments, palynology, botany, climate change	Jerry Spangler, Colorado Plateau Archaeological Alliance	Research in progress (NOTE: funds for this project lumped with those for "Archaeological Inventory and Monitoring" same Assistance Agreement)	\$0
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
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

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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	\$10,000
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	\$16,138

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Phylogeography and evolution of <i>Mentzelia cronquistii</i> (Loasaceae) and the <i>Mentzelia marginata</i> 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 <i>Mentzelia marginata</i> 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
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 conservation 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

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Paleoecology study of the GSENM	Assistance Agreement L11AC20143	ecology, paleoecology, paleoenvironment, cultural resources	Scott Anderson, Northern Arizona University and Ken Cole, USGS	Research in progress	\$23,829
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
Ecological effects of stream drying under climate change in the Upper Colorado River Basin	The purpose of the proposed research is to examine the effects of reduced low flow stream on riparian plant communities. Researchers will sample riparian plant communities along a hydrologic gradient (perennial to intermittent) to develop statistical relationships between flow parameters and biotic responses to help predict biotic changes under climate change driven stream drying.	ecology, plant ecology, climate change, hydrology, geomorphology	Lindsay Reynolds et al, USGS	Project completed; final report submitted	\$0
Restoration Studies (and dust collection study)	Determines what mechanisms of disturbance creates 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	\$8,500
Untitled	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	\$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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
Chronostratigraphic delineation of the muddy Entrada Sandstone in central Utah using the $^{40}\text{Ar}/^{39}\text{Ar}$ method to date juvenile ashes; a sequence stratigraphic study	This project will construct a sequence stratigraphic model for the muddy portion of the Entrada Sandstone to correlate deformation in the Entrada to the proposed "Elko Orogeny" using $^{40}\text{Ar}/^{39}\text{Ar}$ dating and chemical analyses	geology	Toby Dossett, BYU	Research in progress	\$0
untitled	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 FY14	\$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
untitled	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; annual report submitted; publication of one book chapter; one paper submitted to peer reviewed journal (accepted pending minor modification); one public presentation at GSENM	\$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	Two scientific publications in FY2014. 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 Member and 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 (FY15)
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	Results presented at conference. Technical publication in early FY2014.	\$0
NSF Earth Life Transitions (ELT) Project: Perturbation of the Marine Food Web and Extinction During the Oceanic Anoxic Event at the Cenomanian/Turonian 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 U); 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
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; one MS thesis defended (Steve Pinta)—final thesis in prep; two abstracts submitted for professional conferences	\$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	Research in progress; annual report submitted	\$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Ash bed geochronology of Cretaceous sediments in the Grand Staircase Escalante National Monument	Purpose: To date Cretaceous stage boundaries, key fossil sites and Ocean Anoxic Events using ash from various Cretaceous strata, including the Tropic Shale, Dakota, Wahweap, Straight Cliffs and Kaiparowits formations.	geology, stratigraphy, dating	Kirk Johnson, Denver Museum of Nature and Science	Ash samples were analyzed in late FY2013. Publication on results forthcoming.	\$0
Paleomagnetic Survey of Late Cretaceous Strata – Kaiparowits Plateau, Utah (L08AC13131)	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	Scientific publication to be submitted in FY2015. Annual report submitted.	\$0
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; two papers to peer reviewed journals in review, one paper to peer reviewed journal in press; web site developed (Rocks to Models: r2m.utah.edu); eight presentations at professional society meetings	\$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; NOTE: connected with paleo project with Leif Tapanila, Idaho State U (Assistance Agreement L12AC20541)	Research in progress	\$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Ground Water Study to Inventory and Map Water Wells in the Grand Staircase Escalante National Monument (L10PG00902)	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	Currently funded phase of research completed; final report and geodatabases submitted	\$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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 (MacKinnon, W.C., J.W. Karl, G.R. Toevs, J.J. Taylor, M. Karl, C.S. Spurrier, and J.E. Herrick. 2011. BLM core terrestrial indicators and methods. Tech Note 440. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.).	land health	Jerry Keir, Great Basin Institute	Research in progress; annual report and datasets submitted	\$40,000
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	\$35,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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. One scientific publication (book chapter)	\$14,000
Kaiparowits Basin Project Invertebrate Survey (L12AC20541)	Survey of Invertebrate Molluscan diversity and correlation of ecological disparity with environmental facies.	paleontology (invertebrate), paleoenvironment	Drs. Lief Tapanila, Idaho State University, and Eric Roberts, James Cook University School of Earth and Environmental Sciences, Australia.	Research in progress	\$0
Freshwater molluscan diversity and paleoecology of the Kaiparowits Fm.	Intensive sampling of freshwater molluscs 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; annual report submitted	\$1,200
Middle Jurassic mammalian diversity.	Inventory of Middle Jurassic age rocks for primitive therians.	paleontology (vertebrate)	Dr. Brian Davis, Missouri Southern State University	Research in progress; annual report submitted	\$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; annual report submitted	\$0

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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, Weber State University	Research in progress; annual report submitted	\$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 crocodylians 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	\$16,000
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.	Three scientific publications in FY2014, including a book chapter.	\$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.	Two scientific publications in FY2014. 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, paleoenvironment	Randall Irmis, Natural History Museum of Utah at the University of Utah	Research in progress; annual report submitted	\$25,000
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, paleobotanical, ichnology).	Dr. Alan Titus, Monument Paleontologist, Grand Staircase Escalante National Monument.	Technical Book published. One additional scientific publication. Annual report submitted.	In house

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Utah BLM State Monitoring	New long term trend monitoring designed to make data collection uniform across the state	range management	Utah State BLM, Univ. of Arizona	Research in progress	\$0
GSENM Recreation Experience Baseline Study (L12AC20566)	This study is designed to facilitate social science research aimed at understanding recreation experiences at Grand Staircase Escalante National Monument (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	\$25,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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.	\$25,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
Research to Evaluate Visitor Capacity of the Dry Fork slot canyons and within the Calf Creek watershed and analysis of existing data (Interagency Agreement IGO 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 beginning in spring 2015	\$8,000
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	Identifys 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	\$2,000
Hummingbird migration study	Banding and tracking migration of the different species of humming birds and their importance to pollinization.	wildlife, hummingbirds, botany	Terry Tolbert, GSENM; also volunteers, Dixie National Forest, BCNP	Research in progress	\$8,000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
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
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	\$3000

Project Name	Project Description	Project Key Words	Principal Investigator	Project Status/ Accomplishments	BLM Contributed Funds (FY15)
untitled	This project will conduct a taxonomic revision and provide an identification key for the New World species of <i>Heliophila</i> .	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 <i>Plagiomimicus</i> (Noctuidae, Amphipyridae), conduct a general sampling of moths, and search for and collect a new subspecies (possible new species) of butterfly diurnally (net) in the genus <i>Euphilotes</i> (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, Lepidoptera	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 (FY15)
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 <i>Nemoria</i> .	zoology, Lepidoptera	John W. Gruber, Friends' Central School and Jason D. Weintraub, Academy of Natural Sciences of Philadelphia	Research in progress	\$0

5 Resources, Objects, Values, and Stressors

Scientific Study and Landscape-related Values

The Grand Staircase-Escalante National Monument'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			
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 Utah BLM Wilderness Inventory; 1999 Utah BLM Wilderness Inventory	881,997 acres of Wilderness Study Area or Instant Study Area; 208,438 additional acres of Lands with Wilderness Character	1,090,435	881,197
Unspoiled natural area	1980 Utah BLM Wilderness Inventory; 1999 Utah BLM Wilderness Inventory	881,997 acres of Wilderness Study Area or Instant Study Area; 208,438 additional acres of Lands with Wilderness Character	1,090,435	881,197
Frontier character	1980 and 1999 Utah BLM Wilderness inventory; see also cultural resource inventory	881,997 acres of Wilderness Study Area or Instant Study Area; 208438 additional acres of Lands with Wilderness Character	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.

Monument geological resources 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
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, etc.)	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.	124,506 acres (7% of GSENM) surveyed through FY14; 9,960 new acres surveyed in FY15 totals are taken from annual reports published by formal partners and the in house GSENM paleontologist	134,466 acres. About half of that contains resource. 100 new fossil sites were documented by BLM crews during FY15: all but seven are vertebrate sites; all of the sites are in Cretaceous age strata of the Kaiparowits Basin. 20 sites were excavated or required intensive surface collection by larger BLM crews. Numerous other localities were documented and/or collected by other institutions.	A total of 50 sites were monitored in FY15
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)	Unknown	The Wolverine Trailhead site (one site, about 5 acres) is monitored every year, including FY2014, for qualitative condition. No unauthorized collection was noted in FY14.

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, 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) FY2105: 727 ac	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 granaries) have been lumped together as "Archaeological sites" for this reporting. Numbers are approximate.	77 sites
Modern tribal use (Southern Paiute 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

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.)
Historic Inscriptions	pedestrian inventories	130,000 acres (~7% of GSENM)	255 sites	they disappear; priority may increase due to the grazing EIS Historic inscriptions are a common element at historic sites, and are common across GSENM; numbers approximate.
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)
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

(from greater to lesser effect)

- erosion and other natural processes
- human impacts
 - recreation
 - looting
 - vandalism
- grazing impacts such as trampling, trailing, and 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 has been inventoried.	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 1400 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 Escalante Rivers)	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
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	Varies, but most springs are stable, many seeps are unknown. Actively running streams have been assessed.

Status and Trend Biological Objects and Resources		
Value	Status	Trend
	feasible	
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
Canyon Bottom Floristic Communities	Modified Whitaker Plots no systematic GSENM wide inventory; extent unknown	Tom Stohlgren with CSU did 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	200000 acres	2 sites
Relict Plant Communities	no systematic GSENM wide inventory; extent unknown			0
No Man's Mesa	Long Term Trend Studies	1500 acres	1500 acres	750 acres

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.)
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)
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 being inventoried. Nearly all habitat types have been inventoried in one way or another.	1.9 million acres, or the entirety of the Monument 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, or the entirety of the Monument 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.
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 on thousands of acres.

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.)
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, or the entirety of the Monument 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 count contribute to knowledge regarding bird diversity.
Bald Eagles	Winter raptor surveys	Approximately 200 miles of highway are surveyed annually.	1.9 million acres, or the entirety of the Monument 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.
Peregrine Falcons	Territory monitoring, raptor surveys, wildlife observation reports, winter raptor surveys.	Approximately 1,500,000 acres of the Monument have been surveyed at one time or another in search of 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 mentioned streams have been surveyed for migratory birds either through point count surveys or mist netting. This has been conducted by both BLM and UDWR staff.	These two mentioned 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.

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.)
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
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
Soils	soil survey (3rd Order)	1.9 million acres (all of GSENM)	1.9 million acres	Systematic monitoring began FY13 with AIM; in FY15, 21 sites were monitored/added.

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.)
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 that samples 5 10% of each inventoried stand for items such as: 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 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. 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 through 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. Distinguish from the 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 and FY15, will remedy some of these information gaps; dedicated inventory targeting these resources is still needed.

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
Long, dignified human history	Good	Stable

*This table is a synthesis of the individual object/value status tables in the “Objects, Values, and Stressors” section.

Summary Table*		
Geological, Paleontological, Archaeological and Historic Objects and Resources		
Resource, Object, or Value	Status	Trend
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
Archaeological sites	Generally good; range from “Poor” to “Excellent”	Generally stable, some natural erosion
Historic objects	Generally good	Generally stable

*This table is a synthesis of the individual object/value status tables in the “Objects, Values, and Stressors” section.

Summary Table*		
Biological Objects and Resources		
Resource, Object, or Value	Status	Trend
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
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

*This table is a synthesis of the individual object/value status tables in the "Objects, Values, and Stressors" section.

7 Manager's Letter-2015

Growth was the theme for 2015 at Grand Staircase-Escalante National Monument. Growth in visitation and permits issued, growth in projects planned, continued and implemented and increases in project monitoring and assessments.

Along with much of Southern Utah, GSENM saw dramatic increases in visitation on the Monument, at our Visitor Centers and in the backcountry. A record 900,000 people visited GSENM, with increases at the four visitor centers ranging from 27% to 69% per month. Record high visitor counts occurred at Lower Calf Creek Falls, Devil's Garden, Dry Fork Slot Canyons, Spencer Flat Road, Burr Trail, Grosnevor Arch, Paria Movie Set, and Toadstools Trailhead.

Visitor center staff issued a total of 3,482 backcountry and overnight car camping permits, up from 2,490 in 2014. Special Recreation Permit holders increased from 92 to 101, along with the interest in Film Permits on the Monument. Six film permits were issued supporting tourism marketing, events and small production movies.

Fortunately, a dramatic increase in the number of volunteers helping us out was also evident. We went from 120 volunteers in 2014 to 258 volunteers in 2015! Added to that was 27 hosted workers and nine Campground Hosts for a total of 32,375 hours and \$705,193 in value of work.

GSENM saw an increase in the number of projects proposed and we were able to complete the NEPA documents necessary to adequately evaluate and make decisions on multiple projects. A programmatic noxious weed and non-native invasive plant management environmental assessment was completed, which allows us to implement an integrated weed management program and react quickly to newly discovered weed infestations.

GSENM saw progress on our on-going projects. GSENM held public meetings to receive comments on the Grazing EIS Preliminary Draft Alternatives and after a 45-day comment period, worked to develop the Draft Alternatives that will be analyzed in the EIS. Work on the Recreation Experience Baseline Study and Acoustic Monitoring Baseline Research continued. Progress on made on the Eightmile Pond Salinity project. Seeds from over 30 species of plants were gathered on the Monument for the seeds of success program and reclamation efforts on the Monument.

GSENM and our Partners took on additional projects including serving as the pilot project for the new NLCS Sign Initiative and installing the new portal signs and trailhead signs, unveiling a new GSENM poster, hosting a Restoration Forum, working with Grand Staircase Escalante Partners in the establishment of the Frontier Science School, and working with Dr. David Cole to address the impacts of the increasing visitation and use on the Monument.

GSENM also saw increased monitoring & assessments. GSENM worked with Great Basin Institute project leaders and field crews to establish an additional 21 Assessment, Inventory, and Monitoring (AIM) stations on the Monument. We assisted the Utah Department of Wildlife Resources this year with midwinter bald eagle surveys, the annual bat blitz, peregrine surveys, Colorado cutthroat trout spawning, breeding bird surveys, Legacy bat monitoring project, and mountain goat roundups. Bat monitoring continued, catching 15 out of the 18 known bat species from Utah and the sixth season for Hummingbird monitoring and pollen collection was completed. A Monument ID team conducted Riparian Functioning Condition Assessments on five lentic sites the Fiftymile Mountain, with the results showing an improvement of riparian conditions. Monitoring and data collection was completed across 34 allotments, and 152 livestock grazing compliance inspections were conducted.

All of this growth and increase occurred in spite of flat budgets and a significant turn-over and vacancies in staff and management. Through the combined efforts of our staff, our partners and our volunteers, we were able to achieve much this year.

We look forward to the opportunities and challenges that 2016 will bring. Grand Staircase will celebrate its 20th Anniversary, and we are planning many events and activities to showcase the progress that has been made to conserve, protect and restore the outstanding natural and historic resources of Grand Staircase-Escalante National Monument. We will continue to move forward with our Grazing EIS, implement planned improvements at several recreation sites, work on providing input into the Lake Powell Pipeline project and the Navajo Generating Station, continue on-going projects, monitoring and assessments and continue to address the challenges that increased growth brings.

A big thank you to all of our current and former staff, volunteers, partners for your work and efforts to help manage, restore, protect and promote Grand Staircase-Escalante National Monument.

Cindy Staszak
Monument Manager





NATIONAL CONSERVATION LANDS

Grand Staircase-Escalante

National Monument

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DATE: March 1, 2016

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