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**Sent:** 2017-10-02T16:59:09-04:00  
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**Subject:** Resend: Monthly Hot Topic Snapshot for Week of October 2  
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[Monthly Hot Topic Snapshot week of October 2.docx](#)

Hi Again Folks, please use this version of the Monthly Hot Topic Snapshot for the week of Oct. 2 which has been updated with next week's pre-brief for the Carson City Nevada PRMP/FEIS. Sorry I missed that on the earlier version.

Thanks.

Britta Nelson, M.P.A., Program Analyst  
National Conservation Lands (WO-410)  
Bureau of Land Management  
303.236.0539

On Mon, Oct 2, 2017 at 1:17 PM, Nelson, Britta <[bknelson@blm.gov](mailto:bknelson@blm.gov)> wrote:

Hi Folks, the Monthly Hot Topic Snapshot for the week of October 2 is attached.

Please let me know if you have any questions.

Britta Nelson, M.P.A., Program Analyst  
National Conservation Lands (WO-410)  
Bureau of Land Management  
303.236.0539



**NATIONAL  
CONSERVATION  
LANDS**

Utah

# Beaver Dam Wash National Conservation Area



## Annual Manager's Report—Fiscal Year 2017

DOI-2021-03 02006



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# 1 Beaver Dam Wash NCA Profile

## Designating Authority

The designating authority for the Beaver Dam Wash National Conservation Area (NCA) is the *Omnibus Public Land Management Act* of 2009 (Public Law 111-11, hereinafter OPLMA) at Title I, Subtitle O, Washington County, Utah, sec. 1975. The designation was amended by a map included in the 2010 Interior and Environment Appropriations Bill Conference Agreement of October 2009 showing modifications to the boundaries that reduced the public land acreage of the NCA from approximately 68,083 acres to the current acreage of approximately 63,480 acres.

**Date of Designation:** March 30, 2009

## Acreage

Total Acres in Unit	BLM Acres	Other Fed. Acres	State Acres	Other Acres
72,097	63,478	0	6,492	2,127

## Contact Information

Unit Manager	Phone	E-mail	Mailing Address
Dawna Ferris-Rowley	435-688-3216	d8ferris@blm.gov	Public Lands Information Center 345 E. Riverside Dr. St. George, UT 84790

Field Office	District Office	State Office
St. George Field Office	Color Country District	Utah State Office





**NATIONAL  
CONSERVATION  
LANDS**

Utah

# Beaver Dam Wash National Conservation Area

## Legend

- Climbing Area
- Point of Interest
- Historic Trail\*  
\*Historic trails are in approximate locations and are not hiking trails.
- Paved Road
- Unimproved Road
- National Conservation Area
- Wilderness Area

0 2.5 5 Miles



NEVADA

UTAH

Beaver Dam Wash  
Elevation 2,178ft  
Lowest Point in Utah

UTAH  
ARIZONA

Welcome Springs  
Climbing Area

Utah Hills  
Climbing Area

Joshua Tree  
National  
Natural Landmark

Woodbury Road  
Climbing Area

To Santa Clara/  
St George

OLD HIGHWAY 91

OLD HIGHWAY 91

To Beaver Dam

No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for use or for purposes not intended by BLM.

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## Budget

Total FY16 Budget	Sub-activity 1711	Other Sub-activities' Contributions	Other Funding
\$492,000	\$362,000	\$130,000	N/A

## Managing Partners

N/A

## Staffing

The Beaver Dam Wash Cliffs NCA shares management and staff with the Red Cliffs NCA, also administered by the St. George Field Office (SGFO). The NCA Manager supervises the following positions that comprise the permanent, full-time staff for the two NCAs: Archeologist; Archeological Technician; Biologist; GIS Specialist; Landscape Architect; two Outdoor Recreation Planners, and two Park Rangers. The NCA staff also supports the SGFO, performing work in their areas of expertise on public lands outside of the two NCAs. On average, approximately 40% of NCA staff time is devoted to projects and work in the NCAs, the remainder for work on public lands managed by SGFO. Other BLM programs, such as Outdoor Recreation, Rangeland Management, and Threatened and Endangered Species Management, provide funding for salaries and other costs for work done by NCA staff, both within and outside of the NCAs.

As examples of the support that the NCA staff provides to the SGFO, in January of 2017, the NCA Biologist assumed responsibility for the biological and botanical resources programs for the SGFO, when a retirement left the Field Office Biologist position vacant. The NCA biologist continued in that role throughout the fiscal year, while also performing collateral duties as the NEPA Coordinator for the NCAs and the SGFO.



The NCA Landscape Architect provides contract and facilities design support to all programs managed by the SGFO and develops multi-media interpretive products for the NCAs and SGFO. The NCA Archeologist and Archeological Technician support the management of cultural resources on public lands outside the NCAs and host a volunteer site stewardship program that provides regular monitoring of at-risk archeological sites on all public lands in Washington County. One of the NCA Outdoor Recreation Planners continues to perform collateral duties as the point of contact for the Wilderness Management Program and the Visual Resource Management Program for the SGFO and serves as the project lead for the OPLMA-mandated Comprehensive Travel and Transportation Management Plan for all public lands in Washington County. The second NCA Outdoor Recreation Planner manages the Special Recreation Permit (SRP) program for NCAs and the SGFO. He is also the point of contact for the Caves and Karst Management for the NCAs and the SGFO and continues to have collateral duties as BLM-Utah's State Program Lead for the Cave and Karst Management Program.

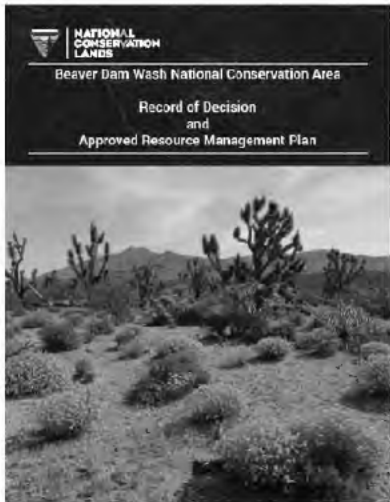
Administrative Support, Lands and Realty, or Rangeland Management Specialists from the SGFO provide support to the management of the NCA. The Color Country District Office, located in Cedar City, Utah, provides Fire Management (Suppression), Engineering, Force Account, and Budget services. Two BLM Law Enforcement Rangers, based in St. George, conduct patrols in the Beaver Dam Wash NCA. However, as they are shared District-wide resources, their availability for patrols in the NCA is constrained by the need to support the SGFO and other Field Offices within the District.

### **Headquarters/Visitor Center**

The NCA Manager and staff are co-located in an interagency Public Land Information Center Office in St. George, UT with management and staff from the SGFO, BLM-Arizona Strip District Office, the Arizona Strip Field Office, and the Vermilion Cliffs National Monument. The Dixie-Arizona Strip Interpretive Association (DASIA) supports the management of the interagency Public Land Information Center, providing volunteers and staff to assist with public contacts.

## 2 Planning and NEPA

### Status of the Resource Management Plan



The *Beaver Dam Wash National Conservation Area Record of Decision and Resource Management Plan* (RMP, 2016) now provides the goals, objectives, and decisions for the long-term management of resource values and land uses in the NCA. The BLM-Utah State Director signed the Record of Decision (ROD), approving the new RMP, on December 21, 2016. The ROD/Approved RMP are available online at: <https://goo.gl/6XcmBD>.

### Protests on the Resource Management Plan

Early in FY17, the NCA Manager and staff assisted the BLM Director's Office staff in the review of nine protest letters received during the 30-day protest period on the Proposed RMP/Final Environmental Impact Statement (FEIS). Entities that participated in the planning process with interests that might be adversely affected by the approval of the RMP are eligible to file protests. After careful consideration of all the points raised in the protests, the BLM Director concluded that the BLM planning team and decision makers followed all applicable laws, regulations, policies, and pertinent resource considerations in developing the Proposed RMP/FEIS. Thus, the protest review did not result in any changes to the Proposed RMP.

The approval of the ROD by the BLM-Utah State Director served as the final decision by the Department of the Interior for all land use planning level decisions included in the Approved RMP.

### IBLA Appeals on the Resource Management Plan

Washington County, the Washington County Water Conservancy District, and the City of St. George collectively filed an appeal with the IBLA (IBLA 2017-102) on January 22, 2017 regarding the RMP decision to manage 63,352 acres of the Beaver Dam Wash NCA as an Exclusion area to new rights-of-way (ROWS) and 128 acres as ROW Avoidance area. On April 28, 2017, the IBLA issued an Order dismissing this appeal.



## **Status of the RMP Implementation Strategy**

The NCA Manager and staff began drafting an Implementation Strategy for the new RMP in FY17 but expect that it will not be completed until after the approval of a OPLMA-directed Comprehensive Travel and Transportation Management Plan (TMP) for public lands in Washington County. The TMP is a high priority planning effort that will continue to require a major commitment of time from the NCA and SGFO management and staff in FY18.

## **Status of Activity Plans**

### **Comprehensive Travel and Transportation Management Plan (TMP)**

The NCA Manager and staff continued work on the TMP. An Environmental Assessment to support the TMP is currently in review by BLM staff. The NCA GIS Specialist is assisting the BLM's National Operations Center in the development of software that will facilitate the receipt and analysis of public comments on the TMP, once the draft is released for public review and comment.

The NCA Manager and Archeologist initiated consultation under Section 106 of the National Historic Preservation Act for the TMP with the Utah State Historic Preservation Officer and culturally-affiliated American Indian Tribes, including the Shivwits Band of the Paiute Indian Tribe of Utah, the Paiute Indian Tribe of Utah, the Kaibab Paiute Tribe, the Hopi Tribe, and the Navajo Nation. As required by 36CFR 800.3 (f), interested parties were identified and nine parties were invited to participate as formal consulting parties in the Section 106 process. Three of the invited parties (Southern Utah Wilderness Alliance, The LDS Church, and the Utah Rock Art Research Association) agreed to participate. Consulting parties met on April 26, 2017 to discuss the area of potential effects (APE) for the TMP and the BLM's efforts to identify historic properties (i.e., archeological sites listed to or eligible for listing to the National Register of Historic Places) within the APE. Identification efforts will include intensive pedestrian Class III-level cultural resource inventories within the APE.

## **Key National Environmental Policy Act Actions and/or Project Authorizations**

Completion of the ROD/Approved RMP was the key NEPA action for the NCA during this fiscal year.

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# 3 Year's Projects and Accomplishments

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## General Accomplishments

### Fire-Damaged Habitat Restoration Research

Since 2015, the Utah Partners for Conservation and Development have benefited from Utah Watershed Restoration Initiative funding to support a multi-year experimental habitat restoration research program in fire-damaged Mojave desert tortoise (*Gopherus agassizii*) critical habitat. Project sites are located in both the Red Cliffs and Beaver Dam Wash NCAs, based on a joint proposal submitted by the Utah Division of Wildlife Resources (UDWR) and the BLM. This research has also received funding from multiple sources, including the U.S. Fish and Wildlife Service (USFWS), The Nature Conservancy, the National Fish and Wildlife Service Foundation, and Washington County, bringing the total contributed to this research to over \$100,000.

As re-seeding has proven to be generally unsuccessful as a restoration method in the arid Mojave Desert, this program will research the effectiveness of out-planting mature, nursery grown containerized native species on a large scale, with the goal of re-establishing shrubs, forbs, and grasses that are beneficial to desert tortoise and other wildlife. The Department of Restoration Ecology at the University of Nevada, Las Vegas (UNLV) propagated 5,000 mature containerized plants from locally sourced seeds for habitat restoration in the NCA.

Biologists and botanists from the BLM, UDWR, USFWS, and UNLV selected a 100-acre fire-damaged site in the NCA, as the first habitat restoration research site. It is located within the 1,063-acre Woodbury Desert Study Area, an area within the NCA that is fenced and managed as unavailable for domestic livestock grazing. A GPS-based grid was established on the 100-acre site and approximately 350 smaller research plots were established within that grid. Data were collected on native vegetation community composition, noxious weeds, and exotic invasive species present in the research site.

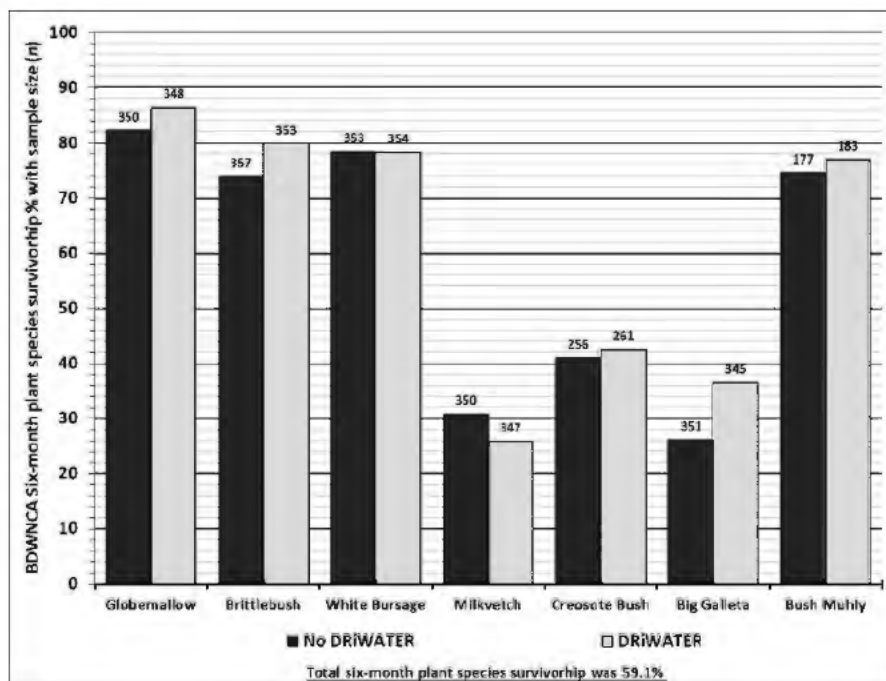




In November of 2016, 4,743 one-gallon size containerized plants were hand planted in the research site by American Conservation Experience (ACE) crews and volunteers. They included seven native species: creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), big galleta (*Pleuraphis rigida*), desert globemallow (*Sphaeralcea ambigua*), bush muhly (*Muhlenbergia spp.*) and Astragalus (*Astragalus spp.*). Thirteen plants were placed in each of the 351 plots, with two plants of each species, except bush muhly, being planted in each plot. Protective chicken wire cages were placed around all but the creosote bush plants, to protect them from small mammal herbivory. An artificial water gel (shown in photo at left) was provided to all plants in alternate

research plots, to evaluate whether its use increases their survival rate. The 354 remaining plants were planted along ephemeral drainages in the research site. All plants were hand watered during the spring and summer months, whenever soil probes indicated that soil moisture at 10" depth had dropped below 12%.

The NCA Biologist completed plant survivorship counts in May 2017. Of the total number of plants planted within the research plots ( $n = 4,385$ ), 2,593 (59.1%) had survived (see graph below). Based on survivorship at six months, it appears that including an artificial water gel does benefit most plant species, but future survivorship data will determine whether the benefits outweigh the costs.



## Rangeland Health Monitoring

The Beaver Dam Slope, Castle Cliff, and Scarecrow Peak Allotments are partially or entirely located within the boundaries of the NCA. A fourth allotment, the Cedar Pockets Allotment contains a pasture within the NCA, but a majority of the allotment is located in Arizona and administered by the BLM Arizona Field Office. The four allotments are permitted for cattle grazing, under a pasture rotation system, with a fall-winter season of use. During FY17, the SGFO Rangeland Management Specialists completed all scheduled utilization and trend monitoring for Beaver Dam Slope and Castle Cliff Allotments and utilization monitoring only for the Scarecrow Peak Allotment, as no trend monitoring was scheduled. The BLM Arizona Field Office staff completed only utilization monitoring for the Cedar Pockets pasture in the NCA, as trend monitoring was not scheduled.

Utilization monitoring is defined as “the portion or degree, expressed in a percent, of the current year’s growth, that is consumed or destroyed by foraging animals”. Monitoring of utilization on key forage species in all allotments was conducted at multiple sites that were selected based on topography, observed changes in vegetation communities, and distance from water sources. Under the Allotment

Management Plans for the three allotments managed by the SGFO, utilization on key species cannot exceed 60% of current year's growth.

Data collected in the Beaver Dam Slope Pasture of the Beaver Dam Slope Allotment documented 20% utilization on key species. In the Desert Pasture of the Castle Cliff Allotment, utilization was 9% on key forage species, while the Bulldog Pasture of this same allotment showed 21% utilization on key species. The Terry Bench Pasture of the Scarecrow Peak Allotment, located partially within the NCA, showed 15% utilization on key species. Clearly, utilization in these three allotments will well below that authorized through the Allotment Management Plans.

Vegetation trend plots were monitored for the same pastures in the Beaver Dam Slope and Castle Cliff Allotments during this fiscal year. No apparent trend for key species was detected for key species in either allotment. No trend monitoring was scheduled for the Scarecrow Peak Allotment.

Precipitation data continued to be collected from rain gauges at two locations within the NCA. Similar data have been collected at these locations for more than 30 years, allowing for comparisons between past and current precipitation regimes. A new solar powered digital "Hobo" weather station was installed in the Woodbury Desert Study Area of the NCA and provides "real time" detailed information on local climatic conditions, including temperature, wind speed, precipitation, and soil moisture levels at three depths.

Noxious weed inventories were conducted by the Rangeland Management Specialists during rangeland health monitoring and infestations in the NCA, including species and location, encoded in the NISMS database. Small-scale infestations of noxious weeds were eradicated, using hand tools, wherever they were encountered.

As part of the overall rangeland health assessments with the BLM, biologists from UDWR completed population studies and habitat monitoring for desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), Gambel's quail (*Calipepla gambelii*) and mourning doves (*Zenaidura macroura*) within the boundaries of the NCA. The NCA includes approximately 8,600 acres of year-long crucial habitat for desert bighorn sheep, and 2,700 acres of crucial winter range and 115 acres of crucial summer fawning habitat for mule deer. Nearly 95% of the NCA is crucial year-round habitat for quail and dove, both popular upland game birds for hunters. Based on data

collected in FY17, UDWR has concluded that desert bighorn sheep and mule deer populations are increasing, while upland game bird populations remain static.

### **Recreation Management**

The NCA Outdoor Recreation Planners and Park Rangers monitored visitor numbers and uses within the NCA, through visitor contacts and digital traffic counters placed at entry points to popular recreational use locations, such as the technical climbing areas in the Beaver Dam Mountains, and on routes where dispersed auto camping and ATV/UTV riding are popular. The estimated number of visits in FY17 was 9,500, while the number of visitor days totaled 21,000.

Twenty-nine Special Recreation Permits (SRP) currently authorize commercial activities in the NCA, with a majority of the permits being for guided big game hunting for desert bighorn sheep and mule deer. Other SRPs authorize guided rock climbing and wilderness therapy programs for troubled youth. The photo above shows a guided rock climb, authorized under one of the commercial SRPs.

### **Current Area of Focus**

Having just completed a new RMP for the Beaver Dam Wash NCA, the NCA Manager and staff are now beginning to implement decisions from that plan. The installation of new two and four-sided kiosks is currently underway to display maps, regulatory and safety information, and interpretative panels along primary roads that cross the NCA. An Interpretive Concept Design Plan was contracted in FY17 and will help to identify the important themes for the NCA and guide the content, media, and location for interpretation of those themes. During this fiscal year, we also began marking the authorized dispersed camping sites along routes in the NCA, installing fiberglass posts with information decals and metal fire rings at those locations.



## Education, Outreach, and Interpretation

### Environmental Education

The NCA Biologist provided in-the-field environmental education outreach for youth attending the Red Rock Canyon School, a psychiatric residential treatment center for 12 to 18 year old teens. After learning about Mojave Desert ecology and desert tortoise, students assisted with belt transect surveys for live tortoise, burrows, and scat in the Woodbury Desert Study Area of the NCA. Students, as shown in the photo at left, also helped to plant and cage containerized native plants in November of 2016.



### Interpretation



In FY17, the BLM contracted with Sea Reach, a firm with over 30 years of experience writing interpretive plans, to prepare an Interpretive Concept Design Plan for the NCA. Sea Reach personnel joined the NCA Manager and staff for a tour of the NCA in July and will facilitate workshops with

NCA staff, various stakeholders, and partner groups in October 2017 to identify themes that should be interpreted for the NCA.

The NCA Landscape Architect developed two new interpretive panels, shown below, for placement in a kiosk in the Woodbury Desert Study Area, adjacent to the 100 acre habitat restoration site. The left panel describes research studies conducted on

Mojave desert tortoise in the Study Area during the 1930s by Angus Woodbury. The second panel describes the ongoing tortoise habitat restoration research program.

## Partnerships

### Southern Utah National Conservation Lands Friends (SUNCLF)

The Southern Utah National Conservation Lands Friends (SUNCLF), a 501 (c) (3) non-profit “friends” group, continues to support the BLM’s management of the Beaver Dam Wash NCA, through a Cooperative Assistance Agreement. SUNCLF assists BLM with volunteer stewardship programs, environmental education outreach, and special projects. In FY17, SUNCLF provided information about the NCA at local events, such as “Take it Outdoors Day” and “Junior Ranger Day” and helped to recruit volunteers to assist with the habitat restoration project in the Woodbury Desert Study Area.



### Dixie-Arizona Strip Interpretive Association (DASIA)

Outreach for the NCA is also provided by Dixie-Arizona Strip Interpretive Association (DASIA), also a 501 (c) (3) not-for-profit group, through a Cooperative Assistance Agreement with BLM. DASIA recruits volunteers who assist with public contacts and visitor services in the interagency Public Lands Information Center in St. George, UT and with special projects. Speakers are scheduled by DASIA for the very popular weekly Friday Brown Bag Lecture Series, held in Public Lands Information Center.



### Song Dog Native Plant Nursery, Lake Mead National Recreation Area

In FY17, a new Inter-Agency Agreement was established with the National Park Service’s (NPS) Lake Mead National Recreation Area, headquartered in Boulder City, Nevada, to grow containerized native plants for habitat restoration projects in the NCA and provide technical assistance to restoration project planning. The NPS Song Dog Native Plant Nursery staff have many years of experience propagating Mojave Desert

species and large-scale facilities in which to grow mature plants.

## Volunteers

Volunteers donated more than 500 hours of time to assist with habitat restoration and resource monitoring in FY17. As examples:



Thirty volunteers, shown at left, recruited by The Nature Conservancy and SUNCLF donated more than 320 hours of volunteer time, making wire cages to protect the 4,743 native plants that were planted in the Woodbury Desert Study Area to restore fire-damaged tortoise habitat.

Volunteer trail stewards from the Old Spanish Trail Association donated 80 hours of time conducting field inventories to identify whether high potential segments of the Armijo Route of the Old Spanish National Historic Trail were present in Bull Dog Canyon, in the NCA.

## Land (or Interests in Land) Acquisitions

No lands or interests in lands were acquired during this fiscal year.

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# 4 Science

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## Science Plan

A Science Plan has not yet been formalized for the Beaver Dam Wash NCA. However, some of the opportunities for research that would inform the long-term management of the NCA were identified in the ROD and Approved RMP. These opportunities will be included in the comprehensive Science Plan that will be developed in the future. Scientific research that is ongoing at this time in the NCA includes the following:

### **Tortoise Population Spatial Distribution and Relative Abundance Study**

In FY17, the NCA Biologist, assisted by two Biological Resource Associates from the American Conservation Experience (ACE), began a new tortoise study in the 1,063 acre Woodbury Desert Study Area of the NCA. The goals of this population study are to determine: (1) the spatial distribution of live tortoises and their sign; (2) the relative abundance of tortoises; (3) the location of key habitat features including tortoise burrows and shelters; and (4) current tortoise habitat use and habitat use changes over time, in relation to habitat restoration areas.

The field methodology involves biologists walking parallel north-south oriented belt transects, spaced at 10 meter intervals, collecting geo-spatial data on observed tortoises, burrows, scat or other evidence of tortoise use, as well as documenting native and exotic vegetation and other wildlife observed in the Study Area. Digital photographs and videos of the tortoise observations will supplement the documentation. This first year's efforts covered approximately 684 acres, including the 100-acre habitat restoration site, and documented 11 live tortoises of diverse age classes, 2 tortoise carcasses, 206 burrows, and 100 specimens of scat.

The first studies of the Mojave desert tortoise were conducted in the Woodbury Desert Study Area during the 1930s and continued for decades in this same area. However, these studies were discontinued in 2002. New baseline data from the current study, however, can be compared to the data collected by past researchers. Observed changes in tortoise distributions and relative abundances could be useful indicators of the species' responses to land uses, such as livestock grazing and recreational activities, or to natural phenomena, including wildfires, invasive species, and changing



climatic conditions. This research could help to focus habitat protection and restoration projects, refine proposals for future population augmentations, and develop additional field studies needed to correlate habitat parameters with tortoise density and distributions. The four photos below, taken during this year's fieldwork, show a desert tortoise, a tortoise burrow, tortoise scat, and two male tortoises fighting over a winter burrow in the Study Area.



### **USFWS Range-wide Annual Monitoring Studies for Mojave Desert Tortoise**

In June of 2017, biological field teams from the USFWS Tortoise Recovery Program conducted annual desert tortoise monitoring, using line distance sampling methods to detect tortoises and sign within approximately 905 acres of the NCA. This monitoring was part of annual studies conducted in the Beaver Dam Slope Subunit of the large Northeastern Mojave Recovery Unit, which includes lands in southwestern Washington County in Utah, southern Nevada, and northeastern Arizona. The objectives of the USFWS range-wide monitoring program are to estimate trends in adult tortoise populations across each recovery unit over at least a 25-year monitoring period and document any detected changes in tortoise distribution within recovery units. Tortoise number and density estimates appear to have steadily increased for the Beaver Dam Slope Subunit, since monitoring studies began in 2001. The apparent increases may be due to improved training of the field crews who are doing the data collection or may represent actual increases in tortoise populations.

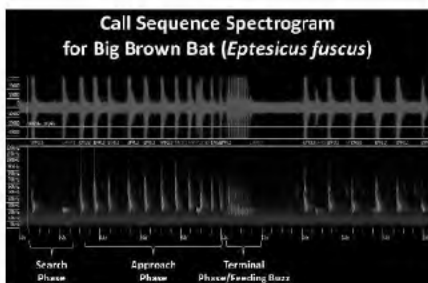
## Acoustical Bat Monitoring Studies

Data on bat distribution, numbers, trends, and ecology are currently very limited for Washington County, Utah, where habitat for bats and other wildlife is rapidly being lost to development. Eighteen species of bats have been identified in Utah, but data on which of those species occur in Washington County is incomplete. In 2015, the BLM initiated monitoring studies in the NCA and elsewhere on public lands in the County, to collect data on bat species and distributions, using permanent and mobile acoustical devices.



Permanent ultrasonic bat recorders are positioned for one year at various locations in the NCA. In FY17, the NCA Biologist, assisted by two Biological Resource Associates from ACE, also recorded bat calls at 10 locations in the NCA, using handheld ultrasonic bat recorders with species identification software, hosted on iPads. The software provides real time species identification of the recorded bat call. The figure below shows a spectrogram of the call of the Big Brown Bat (*Eptesicus fuscus*). Data on bat species identified, location, date, ecological setting, and

meteorological conditions collected by the permanent and mobile recorders are stored in a geodatabase in GIS. Using these data, models can be created for species-habitat distribution and diversity.



Acoustical monitoring studies have verified that 16 or the 18 bat species in Utah are found in the NCA, including a number of BLM Sensitive Species. Additionally, the data collected have expanded the known range of several bat species into the NCA and other areas of Washington County. Information from this ongoing study will enable the BLM to more

effectively conserve, protect, and restore important bat habitats within the NCA and mitigate impacts to these habitats outside of the NCA boundaries.

### Utah State University: XRF Fracture Scanline Survey

In February of 2017, students from the University State University's Geology Department, under the direction of Dr. Kelly Bradbury, used a portable Brucker X-ray Fluorescence Unit (XRF) to analyze the chemical elements of various rock units exposed along a fault in the Beaver Dam Mountains of the NCA. As part of a geology class field trip, students learned to use the XRF unit to "finger print" the chemistry of the rock units exposed along the fault and collected 10 small samples for testing in the lab.

### Dixie State University: Pollinator Studies in the Blackbrush-Joshua Tree Community

During the spring of 2017, students from Dixie State University, under the direction of Dr. Erin O'Brien, Associate Professor of Biology, conducted pollinator studies at four locations: two within the wildfire-damaged Joshua Tree National Natural Landmark, two in unburned areas of the NCA in the blackbrush-Joshua tree community.



The students walked 10 transects, each measuring one meter wide by 1,000 meters long, at each site, estimating exotic annual grass coverage through a meter quadrant plot, documenting Joshua trees in bloom, and surveying for yucca moths (*Tegeticula antithetica*-shown in photo) and other pollinators. During an evening survey at each site, pollinators were identified and counted, using a backlight against a white sheet. This study was funded by the National Park Service's National Natural Landmark Program and a report documenting these findings will be provided to the NPS and the BLM in 2018.

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# 5 Resources, Objects, Values, and Stressors

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The Congressionally-defined purposes for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at sec. 1975, are:

*To conserve, protect and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the Beaver Dam Wash National Conservation Area.*

The BLM has identified a number of natural and cultural resources within the NCA that are unique and scientifically important, including the following:

- Ecological diversity created by the convergence of the Mojave Desert and Great Basin ecoregions;
- Iconic Mojave Desert vegetation communities and Joshua Tree National Natural Landmark;
- Habitats critical for at-risk native species, including the Mojave desert tortoise; Gila monster; Southwestern willow flycatcher; and many species of bats, reptiles, raptors, and migratory birds;
- Archaeological sites that preserve evidence of Archaic, Ancestral Puebloan, and Southern Paiute occupations and land uses;
- The Northern and potential Armijo Routes of the Old Spanish National Historic Trail, the early 19th century pack trail followed by traders, explorers, and settlers as they crossed the arid lands of the Mojave Desert. This trail was recognized by Congress through designation as a National Historic Trail in 2002;
- Historic period Euro-American heritage resources, including 19th century wagon roads and telegraph lines, historic mines, the early 20th century Arrowhead Trails Highway, and features constructed by the Civilian Conservation Corps during the Great Depression of the 1930s.
- Geologic resources, such as the 1.7 billion year-old Precambrian strata of the Beaver Dam Mountains, the oldest exposed rocks in southwest Utah;
- Caves and karsts with unique geological, biological, cultural or recreational values;



The NCA resources are significant from a regional and national perspective because they afford:

- Opportunities for scientific studies of geologic processes and paleo-environments of the earliest periods of Earth's history, through the exposed geologic units of the Beaver Dam Mountains;
- Opportunities for habitat restoration and population translocations in critical habitats for the threatened Mojave desert tortoise and other at-risk species of the Beaver Dam Slope;
- Opportunities for re-introductions of native aquatic and riparian species at Welcome Spring and in the Beaver Dam Wash;
- Opportunities for habitat restoration and protection of crucial seasonal ranges and migration corridors for mule deer and desert bighorn sheep;
- Opportunities to continue Mojave Desert plant and animal studies in the Woodbury Desert Study Area;
- Opportunities for solitude, natural quiet, dark night skies, and primitive, unconfined recreation within a large area of remote and substantially undisturbed public lands;
- Opportunities for the public use, interpretation, and high quality vicarious visitor experiences along the Northern and potential Armijo Routes of the Old Spanish National Historic Trail;
- Opportunities for conservation, protection, restoration, scientific study, public use, and interpretation of an array of prehistoric and historic period archaeological sites that document the broad span of human history in southwestern Utah;
- Opportunities for sustainable outdoor recreation and resource interpretation on public lands that enhance the quality of life for local residents and visitors and help to sustain the economic health of local communities;
- Opportunities for broad-based scientific, academic, and community partnerships, volunteer programs, youth and veteran training and employment initiatives, developed to enhance public appreciation and citizen stewardship of the NCA resources and values

As benchmarks have not been established through a Science Plan, the following assessment focuses on those resources for which status and trend are currently being monitored in the NCA.

# Ecological Resources

## Native Upland Vegetation Communities

The NCA is within a transition zone between the Mojave Desert and the Great Basin eco-regions and includes vegetation communities from the two eco-regions. These communities include Mojave Desert shrubs, like creosote bush, white bursage, and blackbrush, and various species of cacti, yucca, and Utah agave. The iconic Joshua tree co-occurs with blackbrush and scattered Utah juniper trees. Basin Big sagebrush and mountain mahogany, species that are typically associated with the Great Basin eco-region, grow at higher elevations in the NCA.

The ecological health of the upland vegetation communities was assessed in 2011, through a Landscape Conservation Forecasting Process conducted in partnership with The Nature Conservancy. The assessments of status and trend provided below are based on the Natural Range of Variability (NRV) used in that process. Monitoring is conducted in each community, with the acreages completed in FY17 shown in the table below.

Status of Native Upland Vegetation		Trend	
Fair to Good		Stable	
Inventory, Assessment, Monitoring of Native Upland Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	Creosote:22,041 Blackbrush:37,281 Pinyon-juniper:270 Mountain shrub:143 Big Sagebrush:14	Creosote:22,041 Blackbrush:37,281 Pinyon-juniper:270 Mountain shrub:143 Big Sagebrush:14	Creosote: 15,000 Blackbrush: 35,000 Pinyon-juniper: 0 Mountain shrub-0 Big Sagebrush-0

## Riparian Vegetation

Warm desert riparian and riparian wash vegetation was mapped and the ecological health of these communities evaluated along the Beaver Dam Wash, Welcome Creek, and many ephemeral drainages in 2011, during the Landscape Conservation Forecasting Process, conducted in partnership with The Nature Conservancy. Woody species that typify both riparian communities include mesquite, native willows, and Fremont's cottonwood.

Status of Riparian Vegetation Status		Trend	
Good		Stable	
Inventory, Assessment, Monitoring of Riparian Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	Warm Desert Riparian:114	Warm Desert Riparian:114	Warm Desert Riparian: 114
	Warm Desert Riparian Wash: 3,345	Warm Desert Riparian Wash: 3,345	Warm Desert Riparian Wash: 2,500

## Stressors Affecting Ecological Resources



Wild fires, exotic invasive annual grasses, and predicted changes in precipitation regimes that will benefit invasive species are the primary stressors affecting all upland vegetation communities. Mature blackbrush-Joshua tree shrub lands, in particular, have been most severely impacted. Over the past 20 years, wild fires, fueled by exotic annual brome grasses, have burned or re-burned 80% of this community; many re-burn areas have been converted to exotic brome grasslands that prevent the re-establishment of native species. As Mojave Desert vegetation is slow to recover, even under optimum conditions, it will be centuries before mature blackbrush

and Joshua tree communities are again present in the fire-damaged areas of the NCA.

Riparian vegetation along Beaver Dam Wash, Welcome Creek, and ephemeral drainages are impacted by episodic flooding; livestock grazing; unauthorized motorized vehicle travel; and exotic species infestations. Cattle in the Beaver Dam Slope and Jackson Wash Allotments have access to the riparian zones and create vegetation impacts and soil disturbances that accelerate stream bank erosion and temporarily impair surface water quality. Exotic salt cedar (*Tamarack* spp.) in the riparian areas and ephemeral drainages competes with native species and reduces available surface water. Exclosure fencing around the Welcome Springs complex has helped to protect the riparian vegetation at the spring sources and along a portion of Welcome Creek from livestock grazing and motorized vehicle-related damage. Native willows and other riparian species are recovering and increasing in areal extent within the exclosure.

## Wildlife: Threatened and Endangered Species

Because the NCA lies within a transition zone between the Mojave Desert and the Great Basin, it provides a mosaic of habitats for diverse wildlife species, some at the extremes of their historic ranges. Such species tend to have less stable populations than those closer to the center of their range. The threatened Mojave desert tortoise occurs in the NCA and data are collected annually on population trends and habitat conditions by the BLM and the USFWS.

Two avian species, the Southwestern willow flycatcher (*Empidonax traillii extimis*) and Western yellow-billed cuckoo (*Coccyzus americanuss occidentalis*), are listed under the protection of the Endangered Species Act and have the potential to occur in the NCA.



## Mojave Desert Tortoise



The desert tortoise is a long-lived “indicator species” that is useful for evaluating the health of the Mojave Desert ecosystem. Over millions of years of evolution, the species has successfully adapted to changing environmental conditions and has been able to flourish, even in the harsh environment of the Mojave Desert.

Status of Tortoise Critical Habitat		Trend
Fair		Stable in unburned areas Declining in fire-impacted areas
Status of Tortoise Populations		Trend
Fair		Stable to slightly increasing on Beaver Dam Slope of Utah, AZ, and Nevada
Inventory, Assessment, Monitoring Table of Tortoise Critical Habitat		
Acres in Unit	Acres of Critical Habitat	Acres Monitored in FY17
63,480	50,900	1,589 acres

## Stressors Affecting Mojave Desert Tortoise

Wild fires, exotic invasive annuals, and predicted changes in precipitation regimes that will benefit exotic invasive species are the primary stressors affecting the critical habitat of the Mojave desert tortoise. The creosote-bursage community comprises a majority of that critical habitat and has not been impacted by recent wild fires. However, this community remains at high risk of wild fires because invasive brome grasses are present throughout this community. Approximately 80% of the blackbrush-Joshua tree shrublands in the NCA have been damaged by recent fires and will not recover for many years. Some areas impacted by multiple fires have been

converted to invasive brome grasslands which provide limited forage value or shade cover for tortoises. When tortoises, particularly juveniles, consume brome grasses and other exotic species, they suffer nutritional deficiencies that impair their growth and reproductive success. Exotic invasive grassland provide inadequate shade cover for tortoises, increasing for mortalities due to exposure to summer heat and predation.

### **Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Both of these birds are currently listed under the ESA and are riparian obligates that depend on healthy riparian areas with dense stands of willows and cottonwood trees for nesting and foraging. Suitable habitat for these species is present along Beaver Dam Wash. There are no known nesting locations for either species in the NCA and only a single confirmed sighting of a Southwestern willow-flycatcher.

Status of Riparian Habitat for T&E Birds		Trend	
Good		Stable	
Status of Flycatcher and Cuckoo Bird Populations		Trend in NCA	
Declining across ranges		Unknown	
Inventory, Assessment, Monitoring Table of Riparian Habitat for T&E Birds			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	114	114

### **Stressors Affecting Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Habitat loss to developments and infestations by exotic invasive species that degrade riparian areas, such as giant reed (*Arundo donax*) and tamarisk (*Tamarack spp.*), are the principal stressors on these species. Prolonged droughts and predicted changes in

the timing and amounts of annual precipitation could also impact the survival of willows and cottonwood trees that provide critical nesting and foraging habitat for flycatchers and cuckoos.

## Recreation Resources

The public can engage in diverse outdoor recreation opportunities in the NCA during all but the hottest months of summer. The NCA currently has no developed recreation trails or other facilities and current uses are primarily casual and dispersed in nature: car-camping, technical rock climbing, upland big game and game bird hunting, nature photography, and ATV/UTV riding on the network of unpaved roads that cross some areas of the NCA. Many of the SRP holders who operate in the NCA offer commercial guided big game hunts, rock climbs, and motorized vehicle (ATV, 4x4) tours.

In 2017, the estimated number of visits was 9,500, the estimated number of visitor days exceeded 21,000. Both reflect increasing recreational use of the NCA, as it is within easy driving distance of the major metropolitan area of Las Vegas, Nevada and the rapidly growing cities of Mesquite, Nevada, and St. George, Utah. The NCA has the potential to be a recreation destination, as visitor services are developed and information about the recreation opportunities of the area more widely disseminated.

The new NCA RMP contains implementation level decisions that call for the preparation of activity level management plans that will identify specific management actions to enhance sustainable outdoor recreation opportunities. These include a Recreation Area Management Plan (RAMP) for the Beaver Dam Wash Special Recreation Management Area (SRMA), established through the RMP. The RAMP will include the development and management of non-motorized and motorized trail systems, rock climbing, dispersed camping and developed camping sites.

Status of Recreation Resources	Trend
Good	Stable

Inventory, Assessment, Monitoring of Recreation Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	63,480	2,000

### Stressors Affecting Recreation Resources

Recreational resources and opportunities may be affected by any of the stressors that impact other values, as visitors to the NCA typically expect to enjoy unspoiled scenic vistas, wildlife viewing, and natural quiet. Unmanaged recreational uses can not only impact natural and cultural resources but can also impair the quality of visitor experiences.

## Scenic Resources

The rugged and relatively undeveloped character of the NCA landscape contributes to its scenic values. Mojave Desert vegetation, including white bursage, creosote, and several species of cholla, yucca, and barrel cactus gradually transition to stands of blackbrush and Joshua trees on the rolling hills that comprise the lower slopes of the Beaver Dam Mountains. For a brief period every spring, the desert comes alive with vibrant colors, as the desert vegetation enjoys a brief annual bloom. Large washes cut through the landscape, all flowing towards the Beaver Dam Wash, a dominant topographic feature of the landscape. A Visual Resource Inventory (VRI) completed by the BLM for the NCA, has rated its scenic qualities according the four classes used by BLM's Visual Resource Management System.

The naturalness of the landscape also contributes to its scenic qualities and can determined through inventories and evaluations for the presence or absence of wilderness characteristics. These characteristics include size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined recreation. The results of the inventories and evaluations indicated that 69% of the public lands in the NCA possess wilderness characteristics.

Status of Scenic Resources			Trend
Good			Stable
Inventory, Assessment, Monitoring of Scenic Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	VRM Class I-0 VRM Class II-7,586 VRM Class III-43,753 VRM Class IV-12,138	63,480

### Naturalness

Status of Lands with Wilderness Characteristics			Trend
Good			Stable
Inventory, Assessment, and Monitoring of Lands with Wilderness Characteristics			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	43,870	500

### Stressors Affecting Scenic Resources

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors that directly affect the scenic qualities of the NCA. In 2005-2006, catastrophic fires burned or re-burned nearly 50% of the eastern and northern portions of the NCA. As Mojave Desert shrubs are not fire-adapted species, the fire scars will remain visible for decades. In the southern and western portions of the NCA,



the native vegetation communities and the scenic values remain undamaged by fire. Increasing recreational uses, particularly if not properly managed, would also have the potential to impact its natural qualities, if these uses damage resource values and degrade the quality of visitor experiences.

## Cultural and Historical Resources

Many cultural groups have used and occupied the land base of the NCA over the broad expanse of human history. Evidence of this use is preserved in prehistoric and historic period archeological sites and as Traditional Cultural Properties, Native American Sacred Sites, and cultural landscapes. The material culture of ancient Native American cultures, including Archaic, Ancestral Puebloans and Numic-speaking Southern Paiute groups, is found in campsites, rock shelters, and occupation sites. Anglo-European explorers in the 18<sup>th</sup> and 19<sup>th</sup> centuries reported that Southern Paiute groups were cultivating small corn and bean fields in the Beaver Dam Wash. As only a very small percentage of the NCA has been inventoried to identify these cultural resources, many more undocumented sites of significant scientific value will be identified in the future.

The NCA landscape was crossed by the first Anglo-Europeans in this region. In 1826, American fur trapper and explorer Jedediah Smith traveled through Washington County to the Beaver Dam Wash, following its channel south to the Virgin River. By 1829, a long distance pack trail system had been pioneered by New Mexicans to the Spanish missions in California and it crossed the NCA, following the current alignment of Old [U.S.]. Highway 91. From 1829 until about 1850, mule pack train used this trail, labeled by John C. Fremont, who also traveled through the area, as the "Old Spanish Trail". Today, the Old Spanish Trail is a Congressionally- designated National Historic Trail, with the Northern Route and the potential Armijo Route crossing the NCA.

In FY17, volunteers from the Old Spanish Trail Association conducted a field reconnaissance along the potential Armijo Route through the NCA. They examined approximately 5 miles of Bull Dog Canyon within the NCA, looking for any trail traces or artifacts that could be associated with

use of the Old Spanish National Historic Trail during its 19<sup>th</sup> century period of significance.

The new NCA RMP (2016) established a Trail Management Corridor (12, 506 acres in size) for the Old Spanish National Historic Trail that encompasses both the legislatively-depicted Northern Route and the potential Armijo Route. Within that corridor, the setting of the National Historic Trail will be protected by management as an Exclusion Area to new ROWs and under VRM Class II standards. Fire-damaged landscapes within the corridor will be restored with native species, to the extent possible. Wayside exhibits or panels at Welcome or Orientation pullouts will include interpretation of the OSNHT.

### **Cultural Resource Inventories**

Approximately 25 acres along Washington County's Old Highway 91 ROW were inventoried at Class III level by an archeological services contractor, prior to proposed maintenance work by Washington County. This inventory resulted in documentation of two new archaeological sites and updated recordings of six previously-documented sites within and immediately adjacent to the highway ROW. These sites included segments of three historic roadways, Old Highway 91, the Arrowhead Trails Highway, and the Old Mormon Trail, as well as two abandoned early 20<sup>th</sup> century service stations associated with Old Highway 91 and the Arrowhead Trails Highway.

The NCA Archeologist completed 10 acres of Class III inventory in the Woodbury Desert Study Area where another habitat restoration out-planting is planned in FY18. There were no archeological materials or sites identified by that inventory.

Approximately 80 acres were inventoried by NCA staff in the Beaver Dam Mountains along the boundaries of the NCA, to identify undocumented caves and rock shelters that contained cultural resource materials and deposits. This inventory documented one large rock shelter, called "Hidden Midden Cave", and its associated artifacts and cultural deposits. The geologic formations, artifacts, and cultural deposits of this shelter were mapped and an site record completed. Two samples of organic materials were collected and dated using AMS/C14, producing occupancy dates between 820 BP (years Before Present) and 200 BP.

### **Site Monitoring**

During FY17, NCA staff monitored 15 archeological sites, including prehistoric period shelters containing cultural materials and historic period routes, service stations, and two abandoned historic mines, the West Jessy and Jose Cuervo mines, both dating to the late 19<sup>th</sup> century.

Status of Cultural and Historical Values			Trend
Good			Stable
Inventory, Assessment, Monitoring of Cultural and Historical Resources			
Total Acres of Unit	Acres Previously Inventoried	Acres Inventoried in FY17	Sites Monitored in FY17
63,480	4,620	115	15

### Stressors Affecting Cultural and Historical Resources

Stressors on cultural and historical resources include human-caused impacts and surface disturbances related to recreational uses, as well as vandalism and site looting. Wildfires can destroy historic wooden structures or features, and damage rock art bearing geological surfaces. Loss of vegetative cover can accelerate soil erosion that also damages site integrity.

## Natural Resources



### Geological, Paleontological, Cave and Karst Values

In the Beaver Dam Mountains of the NCA are exposed 1.7 billion year old Paleozoic rock units that are of scientific interest in the study of Earth's geologic history, as these are the oldest exposed rocks in southwestern Utah. Other formations contain invertebrate fossils that provide

evidence of changing environmental conditions over time, as plate tectonics, continental expansion, and volcanism influenced Earth's biological history. Some formations in the Beaver Dam Mountains of the NCA are conducive to the formation of caves and karst features, like "Icicle Cave shown in the photo above. Some of these caves contain unique biota or preserve cultural resources.

Status of Geological, Paleontological, and Cave and Karst Values	Trend
Good	Stable

Inventory, Assessment, Monitoring of Paleontological Resources			
Total Acres of Unit	Acres Inventoried through Potential Fossil Yield Evaluations	Localities Recorded in FY17	Localities Monitored in FY17
63,480	63,480	0	2

In FY17, the NCA Outdoor Recreation Planner documented 15 new rock shelters in the NCA. Five previously documented caves and shelters were monitored to identify any visitor-related impacts on their geological structures and/or cultural resource materials and deposits.

Inventory, Assessment, Monitoring of Cave and Karst Resources				
Total Acres of Unit	Acres Previously Inventoried	Acres Inventoried in FY17	New Caves Recorded in FY17	Caves Monitored in FY17
63,480	600	80	15	5



# 6 Summary of Performance Measures

The Congressionally-defined purpose for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at section 1975 are:

*(1)To conserve, protect and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area.*

The following summarizes status and trend for those resources and values identified by Congress for conservation, protection, and enhancement.

Summary Table*		
Resource, Object, or Value	Status	Trend
Ecological-Native Vegetation Communities	Fair to Good	Variable by Veg. Community
Scenic	Good	Stable
Wildlife-T&E Species	Fair	Variable by Species
Recreation Resources	Good	Stable
Cultural/Historical	Good	Stable
Natural-Geological	Good	Stable
Natural-Lands with Wilderness Characteristics	Good	Stable
Educational	Good	Stable
Scientific	Good	Stable

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## 7 Manager's Letter

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Dear Friends of the Beaver Dam Wash NCA:


The Manager's Annual Report highlights just a few of the projects that we completed this year in the Beaver Dam Wash NCA. Our efforts were furthered by contributions from many dedicated volunteers, community partners, researchers, and members of the public who support the conservation purposes of the NCA.

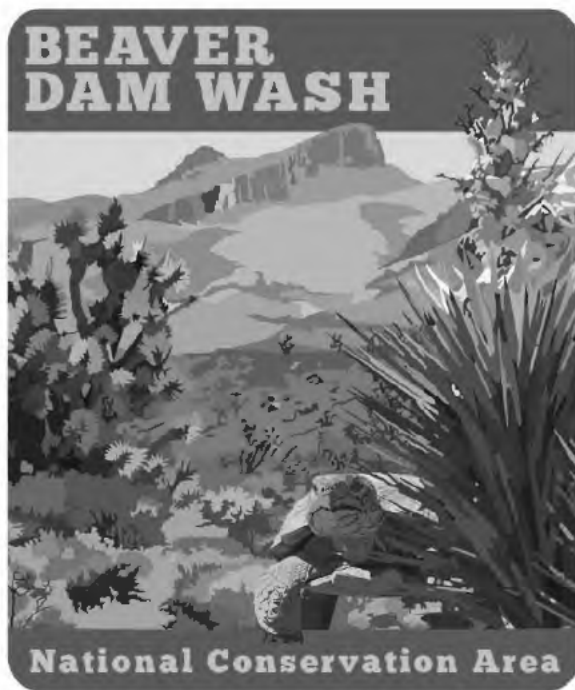
This year we were able to complete the Beaver Dam Wash NCA RMP and have the Record of Decision signed in December. We appreciate the input provided by the public, other Federal and State agencies, and the Cooperating Agencies that helped us to develop a plan that will conserve, protect, and restore the resource values of the NCA. We will now move forward to implement the management actions approved in the new RMP. During the upcoming year, our focus will also be on the following:

- Engaging the public and soliciting input from all affected parties on the Draft Comprehensive Travel and Transportation Management Plan for Washington County when it is released;
- Supporting the local and regional economy, through the granting of Special Recreation Permits for commercial recreational activities compatible with the purposes of the NCA;
- Improving the quality of visitor experiences, through Welcome and Orientation pullouts with kiosks, maps, safety information, and interpretation;
- Supporting scientific research that increases the understanding of the resources and values of the NCA;
- Providing environmental education outreach and engaging students of all ages in NCA projects and research studies; and
- Fostering new opportunities for volunteers of all ages to help us further the conservation purpose of the NCA.

We thank you for your interest in and support of the Beaver Dam Wash NCA.

Sincerely,





**Bureau of Land Management-Utah**  
**St. George Field Office**  
**Public Lands Information Center**  
**345 E. Riverside Drive**  
**St. George, UT 84790**  
**Phone: (435)-688-3200**



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# **Red Cliffs National Conservation Area**

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## **Annual Manager's Report—Fiscal Year 2017**

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# 1 Red Cliffs NCA Profile

## Designating Authority

The designating authority for the Red Cliffs National Conservation Area (NCA) is the *Omnibus Public Land Management Act* of 2009 (Public Law 111-11, hereinafter OPLMA) at Title I, Subtitle O, Washington County, Utah, sec. 1974.

**Date of Designation:** March 30, 2009

## Acreage

The Red Cliffs NCA boundary encompasses approximately 61,218 total acres.

Total Acres in Unit	BLM Acres	Other Fed. Acres	State Acres	Other Acres
61,218	44,909	0	13,727	2,582

## Contact Information

Unit Manager	Phone	E-mail	Mailing Address
Dawna Ferris-Rowley	435-688-3216	d8ferris@blm.gov	Public Lands Information Center 345 E. Riverside Dr. St. George, UT 84790

Field Office	District Office	State Office
St. George Field Office	Color Country District	Utah State Office

# Red Cliffs National Conservation Area



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## Budget

Total FY17 Budget	Sub-activity 1711	Other Sub-activities Contributions	Other Funding
\$ 1,000,005	\$380,000	\$625,000	N/A

## Managing Partners

N/A

## Staffing

The Red Cliffs NCA shares management and staff with the Beaver Dam Wash NCA, also administered by the St. George Field Office (SGFO). The NCA Manager supervises the following positions that comprise the permanent, full-time staff for the two NCAs: Archeologist; Archeological Technician; Biologist; GIS Specialist; Landscape Architect; two Outdoor Recreation Planners, and two Park Rangers. The NCA staff also supports the SGFO, performing work in their areas of expertise on public lands outside of the two NCAs. On average, approximately 40% of NCA staff time is devoted to projects and work in the NCAs, the remainder for work on other public lands managed by SGFO. Other BLM programs, such as Outdoor Recreation, Wilderness, and Threatened and Endangered Species management, provide funding for salaries and other costs for work done by NCA staff outside of the NCAs.

As examples of the support that the NCA staff provides to the SGFO, in January of 2017, the NCA Biologist assumed responsibility for the biological and botanical resources programs for the SGFO, when a retirement left the Field Office Biologist position vacant. The NCA biologist continued in that role throughout the fiscal year, while also performing collateral duties as the NEPA Coordinator for the NCAs and the SGFO.

The NCA Landscape Architect provides contract and facilities design support to all programs managed by the SGFO and develops multi-media interpretive products for the NCAs and SGFO. The NCA Archeologist and Archeological Technician support the management of cultural resources on public lands outside the NCAs and host a

volunteer site stewardship program that provides regular monitoring of at-risk archeological sites on all public lands in Washington County. One of the NCA Outdoor Recreation Planners continues to perform collateral duties as the point of contact for the Wilderness Management Program and the Visual Resource Management Program for the SGFO and serves as the project lead for the OPLMA-mandated Comprehensive Travel and Transportation Management Plan for all public lands in Washington County. The second NCA Outdoor Recreation Planner manages the Special Recreation Permit (SRP) program for NCAs and the SGFO. He is also the point of contact for the Caves and Karst Management for the NCAs and the SGFO and continues to have collateral duties as BLM-Utah's State Program Lead for the Cave and Karst Management Program.

Administrative, Lands and Realty, and Natural Resources staff from the SGFO provided services that supported management of the NCA. The Color Country District Office, located in Cedar City, Utah, provided Fire Management (Suppression), Engineering, Force Account, and Budget services. Two BLM Law Enforcement Rangers, based in St. George, conducted regular patrols in the NCAs. However, as they are shared District-wide resources, their availability for patrols in the NCAs was constrained by the need to support the SGFO and other Field Offices within the District.

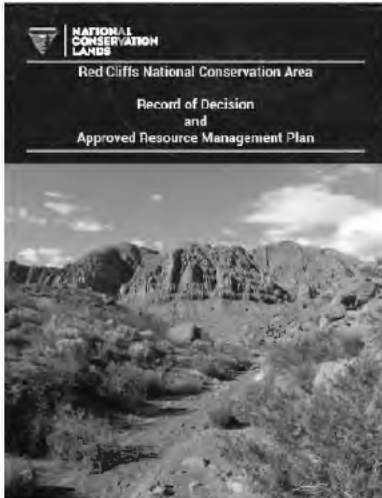
### **Headquarters/Visitor Center**

The NCA Manager and staff are co-located in an Interagency Public Land Information Center Office in St. George, UT with management and staff from the SGFO, the BLM-Arizona Strip District Office, the Arizona Strip Field Office, and the Vermilion Cliffs National Monument. The Dixie-Arizona Strip Interpretive Association (DASIA) supports the management of the interagency Public Land Information Center, providing volunteers and staff to assist with public contacts.



## 2 Planning and NEPA

### Status of the Resource Management Plan



The *Red Cliffs National Conservation Area Record of Decision and Resource Management Plan* (RMP, 2016) is the new land use plan that provides for the long-term management of the NCA. The Record of Decision (ROD), which approved the RMP, was signed by the BLM-Utah State Director on December 21, 2016. The ROD and Approved RMP are available to the public online as a PDF document at: [goo.gl/stvqfS](http://goo.gl/stvqfS).

#### Protests on the Resource Management Plan

Early in FY17, the NCA Manager and staff assisted the BLM Director's Office in Washington D.C. to review 21 protest letters received during the protest period on the Proposed RMP/Final Environmental Impact Statement (FEIS) that ended on October 3, 2016. Entities that participated in the planning process with interests that might be adversely affected by the approval of the RMP are eligible to file protests. After careful consideration of all the points raised in the protests, the BLM Director concluded that the BLM planning team and decision makers followed all applicable laws, regulations, policies, and pertinent resource considerations in developing the Proposed RMP/FEIS. Thus, the protest review did not result in any changes to the Proposed RMP.

The signing of the ROD by the BLM-Utah State Director served as the final decision by the Department of the Interior for all land use planning level decisions included in the Approved RMP.

#### IBLA Appeals on the Resource Management Plan

Washington County, the Washington County Water Conservancy District, and the City of St. George collectively filed an appeal with the IBLA (IBLA 2017-101) on January 22, 2017 regarding the RMP decision to manage 38,472 acres of the Red Cliffs NCA as an Exclusion area to new rights-of-way (ROWs) and 6,367 acres as ROW Avoidance area. On April 28, 2017, the IBLA issued an Order dismissing this appeal.



## **Status of the RMP Implementation Strategy**

The NCA Manager and staff began drafting an Implementation Strategy for the new RMP in FY17 but expect that it will not be completed until after the approval of a OPLMA-directed Comprehensive Travel and Transportation Management Plan (TMP) for public lands in Washington County. The TMP is a high priority planning effort that will continue to require a major commitment of time from the NCA and SGFO management and staff in FY18.

## **Status of Activity Plans**

### **Comprehensive Travel and Transportation Management Plan**

The NCA Manager and staff continued work on the TMP. An Environmental Assessment to support the TMP is currently in review by BLM staff. The NCA GIS Specialist is assisting the BLM's National Operations Center in the development of software that will facilitate the receipt and analysis of public comments on the TMP, once the draft is released for public review and comment.

The NCA Manager and Archeologist initiated consultation under Section 106 of the National Historic Preservation Act for the TMP with the Utah State Historic Preservation Officer and culturally-affiliated American Indian Tribes, including the Shivwits Band of the Paiute Indian Tribe of Utah, the Paiute Indian Tribe of Utah, the Kaibab Paiute Tribe, the Hopi Tribe, and the Navajo Nation. As required by 36CFR 800.3 (f), interested parties were identified and nine parties were invited to participate as formal consulting parties in the Section 106 process. Three of the parties (Southern Utah Wilderness Alliance, The LDS Church, and the Utah Rock Art Research Association) agreed to participate. Consulting parties met on April 26, 2017 to discuss the area of potential effects (APE) for the TMP and the BLM's efforts to identify historic properties (i.e., archeological sites listed to or eligible for listing to the National Register of Historic Places) within the APE. Identification efforts will include intensive pedestrian Class III-level cultural resource inventories within the APE.

### **Key National Environmental Policy Act Actions and/or Project Authorizations**

Completion of the ROD/Approved RMP was the key NEPA action for the NCA during this fiscal year.

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# 3 Year's Projects and Accomplishments

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## General Accomplishments

### Fire-Damaged Habitat Restoration Research

Since 2015, the Utah Partners for Conservation and Development have benefited from Utah Watershed Restoration Initiative funding to support a multi-year experimental habitat restoration research program in fire-damaged Mojave desert tortoise (*Gopherus agassizii*) critical habitat. Project sites are located in both the Red Cliffs and Beaver Dam Wash NCAs, based on a joint proposal submitted by the Utah Division of Wildlife Resources (UDWR) and the BLM. This research has also received funding from multiple sources, including the U.S. Fish and Wildlife Service (USFWS), The Nature Conservancy, the National Fish and Wildlife Service Foundation, and Washington County, bringing the total contributed to this research to over \$100,000.

As re-seeding has proven to be generally unsuccessful as a restoration method in the arid Mojave Desert, this program will research the effectiveness of out-planting mature, nursery grown containerized native species on a large scale, with the goal of re-establishing shrubs, forbs, and grasses that are beneficial to desert tortoise and other wildlife. The Department of Restoration Ecology at the University of Nevada, Las Vegas (UNLV) propagated 5,000 mature containerized plants from locally sourced seeds for habitat restoration in the NCA.

Biologists and botanists from the BLM, UDWR, the USFWS, and UNLV selected a 100-acre site in the NCA. A GPS-based grid was established on this site with smaller research plots located within that grid. Native vegetation species and exotic and invasive annual grasses and forbs were documented for each plot.

In November of 2016, 1,000 one-gallon sized containerized plants were planted in the restoration site. They included four native species: brittlebush (*Encelia farinose*;  $n = 250$ ), white bursage (*Ambrosia dumosa*;  $n = 250$ ), big galleta (*Pleuraphis rigida*;  $n = 250$ ), and desert globemallow (*Sphaeralcea ambigua*;  $n = 250$ ). The planting plan identified low density plots, in which 15 plants were planted in 25 plots, and high density plots in which 25 plants were planted in 25 plots. Protective chicken wire cages were placed around all plants within odd numbered plots. First year survivorship counts are being

conducted by UDWR at this time and the data are currently being compiled.

### **Current Area of Focus**

Having just completed a new RMP for the Red Cliffs NCA, the NCA Manager and staff are beginning to implement decisions from that plan. A recently-contracted Interpretive Concept Design Plan will help to identify important themes for the NCA and guide the content, media, and location for interpretation of those themes.

The NCA Manager continues to serve on Washington County's Habitat Conservation Plan Advisory Committee, an inter-agency group that makes recommendation to the Washington County Commission regarding matters related to the County's Habitat Conservation Plan for the Mojave desert tortoise. A current focus for this group is making needed revisions to the Habitat Conservation Plan (HCP), based on changed circumstances, including the designation of the Red Cliffs NCA in 2009 and the BLM's approval of a new RMP for the NCA. Another revision to the HCP being considered is the management of other lands that support desert tortoise populations as satellite mitigation reserves in support of Washington County's Incidental Take Permit.

## **Education, Outreach, and Interpretation**

### **Environmental Education**

In November, the NCA Biologist provided in-the-field environmental education opportunities for high school students attending the Green Wood Charter School. Students learned about by the Mojave Desert, fire ecology, and the life history of the Mojave desert tortoise and other native species. They had the opportunity to conduct a survey with the NCA Biologist to look for desert tortoise burrows, scat or other tortoise evidence. Their final learning experience was to form teams and construct chicken wire cages to protect the native plants being planted in the habitat restoration research site. The photos below show the students learning about the life history of the horned lizard, shown in middle photo, and surveying for wildlife with the NCA Biologist.



The NCA staff again provided curriculum-based learning experiences for Washington County middle school students during two “Day in the Desert” field days, held annually in the spring and fall, in the Red Cliffs Recreation Area. As one of the learning activities, the NCA Archeologist instructed students about prehistoric Native American hunting technologies. Students then practiced their skills at hitting a life-sized image of an American bison with a wooden spear, using replicas of an atlatl spear-throwing device, shown in the photo at left.

Other learning experiences offered by NCA staff included a hands-on examination of aquatic invertebrates in Quail Creek and the use of GPS units for navigation.

In September of 2017, the NCA Park Ranger and Biologist conducted a guided night hike in the NCA’s Red Cliffs Recreation Area, as one of the events offered during the first-ever regional Southwest Astronomy Festival. The hike began at dusk in the Recreation Area campground, where participants learned about stars, planets, and constellations that were prominent in the night sky and how light pollution impaired dark night skies and stargazing. The NCA Biologist then described nocturnal animal species, their adaptations (e.g., vision, hearing), foraging, and hunting strategies. Participants hiked along the Red Reef East Trail, where the NCA staff used black light



flashlights to locate scorpions (see photos below). They also demonstrated how mobile bat acoustical monitoring equipment, with identification software, could record bat calls and identify of the species by its echolocation call signature. The photo on the far right below shows the call spectrogram of a Big Brown Bat (*Eptesicus fuscus*).



## Outreach

### International Visitor Leadership Program Visit and Panel Discussion

On August 29, 2017, the NCA Manager conducted a field visit to the Red Cliffs Recreation Area for six international visitors, invited to the United States under the auspices of the U.S. State Department's International Visitor Leadership Program. The Utah Council for Citizen Diplomacy arranged the itinerary and contacts for their visit in Utah to highlight the range of services, infrastructure, and education outreach in U.S. National Parks and protected areas and foster discussions among field experts and local communities on the roles of governments and the private sector in parks management, biodiversity preservation, and tourism development.

The six visitors were from Montenegro, Poland, Portugal, Slovenia, Suriname, and Turkey and each held a leadership role in the management of national parks, forests, and other protected areas in their respective countries. During the visit to the Red Cliffs Recreation Area, the NCA Manager described the resources and values of the NCA, the management of the campground and day use areas, the levels of visitation, as well as funding, staffing, visitor services, and other topics of interest to the six international visitors.

Following the site visit, the international visitors participated in a panel discussion with various stakeholders, including the NCA Manager and representatives from Washington County, the State of Utah, the City of St. George, and Snow Canyon State



Park, in St. George. The discussions focused on how federal, state, and local governments in Washington County work together to balance the needs of the environment, communities, and development. The six international visitors described their leadership responsibilities and compared how issues of managing protected lands in their respective countries differed from those in the United States.

## **Interpretation**

In FY17, the BLM contracted with Sea Reach, a firm with over 30 years of experience writing interpretive plans, to prepare an Interpretive Concept Design Plan for the NCA. Sea Reach personnel joined the NCA Manager and staff for a tour of the NCA in July and will facilitate workshops with the NCA staff, various stakeholders, and partner groups in October 2017 to identify themes that should be interpreted for the NCA.

## **Partnerships**

### **Southern Utah National Conservation Lands Friends (SUNCLF)**

The Southern Utah National Conservation Lands Friends (SUNCLF), a 501 (c) (3) non-profit “friends” group, continues to support BLM’s management of the Red Cliffs NCA, through a Cooperative Assistance Agreement. SUNCLF assists BLM with volunteer stewardship programs, environmental education outreach, and special projects. In FY17, SUNCLF provided information about the NCA at local events, such as “Take it Outdoors Day” and “Junior Ranger Day”, and helped to recruit volunteers to assist with the habitat restoration project in the NCA.





In the photo, Washington County middle school students learn about traditional Native American uses of native plants for food, medicine, and fiber from the SUNCLF Public Lands Coordinator, during the “Day in the Desert” learning activities, held in the Red Cliffs Recreation Area.

### **Dixie-Arizona Strip Interpretive Association (DASIA)**

Outreach for the NCA is also provided by Dixie-Arizona Strip Interpretive Association (DASIA), also a 501 (c) (3) not-for-profit group, through a Cooperative Assistance Agreement with BLM. DASIA recruits volunteers who assist with public contacts and visitor services in the interagency Public Lands Information Center in St. George, UT and with special projects.

### **Song Dog Native Plant Nursery, Lake Mead National Recreation Area**

In FY17, the BLM signed a new Inter/Intra-Agency Agreement with the National Park Service’s (NPS) Lake Mead National Recreation Area to grow containerized native plants for habitat restoration projects in the NCA. The NPS Song Dog Native Plant Nursery staff have many years of experience propagating Mojave Desert species and large-scale facilities in which to grow mature plants.

## **Volunteers**

Volunteers donated more than 2,000 hours of time to the conservation and protection of resource values in the NCA. As examples:

- Twenty-five Trail Stewards, hosted by Washington County HCP Administrator’s Office, regularly patrolled more than 130 miles of designated non-motorized trails in the NCA, making visitor contacts and documenting trail conditions; in FY17, these volunteers donated more than 1600 hours of volunteer time.
- Trained Site Stewards donated more than 250 hours, monitoring 25 archeological and paleontological sites in the NCA.

- Volunteers recruited by The Nature Conservancy and SUNCLF donated more than 160 hours, helping to plant native species and make plant cages, in support of a habitat restoration project.

### **Land (or Interests in Land) Acquisitions**

No land or interests in land were acquired during this fiscal year.

# 4 Science

## Science Plan

The Red Cliffs NCA does not yet have a formal Science Plan. However, some of the opportunities for research that would inform the long-term management of the NCA are identified in the ROD and Approved RMP and will be included in a future Science Plan. In FY17, the BLM, other partners, and academic researchers holding valid NCA Scientific Research Permits conducted the following scientific studies:

*BLM: Mojave Desert Tortoise Study to Compare Satellite Tag versus VHF Transmitter Use for Home Range Monitoring.*



The NCA Biologist, assisted by a UDWR biologist, deployed a MicroGPS +H Iridium Satellite Tag on a desert tortoise, to determine the efficacy of Satellite Tag versus VHF transmitter use for home range monitoring. This device, shown attached to the tortoise in the photo, is next-generation wildlife tracking technology that uses

Iridium's 66 low-Earth orbiting cross-linked satellites to capture/store highly accurate coordinate data. Current tortoise monitoring involves locating VHF telemetered tortoises two to three times a week in the field. When Satellite Tags are used, tagged tortoises need to be located only once per month for health assessments, which represents a significant labor and cost savings. The programmable satellite tags are able to collect and store a great quantity/variety of data, thereby increasing monitoring capabilities. Long-term monitoring is critical to assess density and abundance of the Mojave desert tortoise within the NCA, and to evaluate progress being made toward meeting recovery goals for the species.

## BLM: Distribution/Abundance/Monitoring Studies for Gila Monster

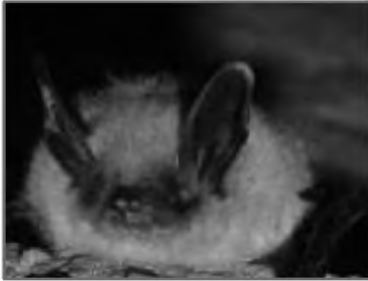


During this fiscal year, the NCA Biologist established a new study program for Gila Monster (*Heloderma suspectum*), a BLM Sensitive Species, within two 100-acre study areas in the NCA. The Utah population of the Gila Monster only occurs in Washington County, and has seen rapid population declines since the 1990s, due principally to habitat loss to development on private and state lands. Additional threats to the species include road mortality, poaching (illegal collection/trade), increasing exposure to domestic predators (dogs/cats), and prolonged periods of drought. Wildland fires on public lands, fueled by invasive annual grasses, have impacted habitat and the prey base of this large reptile, in the NCA. The goals of this new study program are to determine the current distribution, abundance, age structure, diet, home range, and habitat use of a sufficient sample of subpopulations of Gila Monsters in the habitat within the NCA to reliably estimate current status and viability. This information will provide a baseline from which to evaluate future trends and attainment of NCA/BLM Sensitive Species management goals. The photos below clearly show that each Gila Monster has unique markings, making it possible to distinguish individuals within the study populations.





## BLM: Bat Monitoring Studies



Data on bat distribution, numbers, trends, and ecology are currently very limited for Washington County, Utah, where habitat for bats and other wildlife is rapidly being lost to development. Eighteen species of bats have been identified in Utah, but data on which of those species occur in Washington County is incomplete. In 2015, the BLM initiated monitoring studies in the NCA and elsewhere on public lands in the County, to collect data on bat species and distributions, using permanent and mobile acoustical devices.



In 2017, the NCA staff stationed a permanent ultrasonic bat recorder in the abandoned Thomson/Cobb mine, shown in the photo at left, to collect long term monitoring data on bat populations in the mine. An infrared motion-activated camera was installed in the mine, to capture photographic images of bats, and to aid in species identification. In three areas of the mine where bats roost, temperature and relative humidity data loggers were installed, allowing the development of an ambient temperature profile that may facilitate the identification of bat roosting locations in other mines.

The NCA staff inventoried three other abandoned mines in the NCA, to determine if bats were using the mines. The inventories confirmed that two of the abandoned mines were providing habitat of Townsend big-eared (*Corynorhinus townsendii*) and Fringed myotis (*Myotis thysandes*) bats, both BLM Sensitive Species.

The NCA Biologist, assisted by two Biological Resource Associates from ACE, recorded bat calls in the Red Cliffs Recreation Area and along the Virgin River, using handheld ultrasonic bat recorders with species identification software, hosted on iPads. The software provides real time species identification of the recorded bat calls. Data on bat species identified, location, date, ecological setting, and meteorological conditions collected by the permanent and mobile recorders are stored in a geodatabase in GIS. Using these data, models can be created for species and habitat distribution and

diversity. Acoustical monitoring studies have verified that 16 of the 18 bat species identified in Utah are found in the NCA, including a number of BLM Sensitive Species.

### **UDWR: Southwestern Willow Flycatcher (*Empidonax traillii extimus*) and Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) Monitoring**

Avian biologists with UDWR conducted annual monitoring studies along the Virgin River through the NCA for evidence of these riparian obligate species that are both now federally-listed species. Monitoring studies attempt to determine if either species is present in this reach of the river and to identify any foraging and nesting locations. To date, neither species has been observed in the riparian area along the Virgin River in the NCA. Funding for these studies is provided by the inter-agency Virgin River Recovery Program and the Washington County Habitat Conservation Plan (HCP).

### **UDWR: Bi-annual Tortoise Monitoring**

Between April 3 and June 16, 2017, biological field teams from the UDWR conducted bi-annual desert tortoise monitoring, using line distance sampling transects to detect tortoises and signs within approximately 300 acres of the NCA. The objectives of this monitoring program, funded by Washington County's HCP, are to estimate trends in adult tortoise populations within the multi-jurisdictional 62,000 acre Red Cliffs Desert Reserve (Reserve). Protective management of the Reserve's land base serves as the primary mitigation for the County's Incidental Take Permit, issued by the USFWS in 1996 to provide for orderly growth and development on private lands in critical tortoise habitat in Washington County. The Red Cliffs NCA comprises approximately 70% of the land base of the Reserve. Bi-annual monitoring of tortoise populations by UDWR have been ongoing in the Reserve since the County received its Incidental Take Permit and provide valuable data on tortoise populations trends.

The number of tortoises detected during the 2017 monitoring was higher than the previous years (e.g., 2015, 2013). The increase in tortoise numbers may be attributable to the higher than average levels of precipitation that fell during the winter and early spring months in the NCA, supporting the growth of annual and perennial plants that benefit tortoise survival and reproductive success.

### **Southern Utah University: Recreational Use Impact Monitoring**

Students from Southern Utah University, under the direction of Dr. Bridget Eastep, conducted annual field monitoring to identify recreational use impacts in the Red Cliffs Recreation Area, the Babylon Area, and along non-motorized trails in tortoise designated critical habitat within the NCA. Any new social trails and dispersed camping sites are documented through GPS locations and photographs. This annual monitoring program is funded by Washington County's HCP and data provided to the multi-jurisdictional land managers of the County's mitigation reserve, of which the NCA comprises 70% of the land base.

### **Southern Utah University: Ant Studies**

In October, students from Southern Utah University, under the direction of Dr. Carrie Jo Bucklin, Assistant Professor of Biology, collected ant species from 30 locations within the NCA. This collection, and others from locations in Iron and Kane Counties, will be used to create an ant biodiversity map for southern Utah. The hypothesis for this study is that the species and frequencies of ant populations will be different at different elevations due to different abiotic factors. Some of ants collected will also be analyzed for genetic variation among species. The results of this study are expected to be published in 2018.

### **Brigham Young University: Studies on status of the dragonfly species "*Aeshna persephone*" in Utah**

In June, Alan Myrup and Dr. Seth Bybee from Brigham Young University collected adult and nymph voucher specimens of the dragonfly species "*Aeshna persephone*" from along Quail Creek in the NCA, the only known location where *A. persephone* and another dragonfly species, *Aeshna palmate*, co-occur without apparent hybridization. The researchers are attempting to determine the phylogeny of dragonflies belonging to the "paddle-tailed" group of the Genus *Aeshna*, using DNA sequencing as well as the morphology of adults and nymphs. This study will compare specimens of *A. persephone* collected from the NCA, Zion National Park, and the Grand Staircase-Escalante National Monument to specimens from Arizona and New Mexico. A

phylogenetic tree illustrating the relationships among these species and analysis of the findings of this study are expected to be published in 2019.

### **Chiba University, Yokosuka City Museum: Fluvial Response to Climatic Fluctuation, based on outcrop mapping of the Chinle Formation**

Geologists Kenichiro Shibata and Makoto Ito from the Yokosuka City Museum, Kanagawa, Japan, were granted an NCA Science Research Permit to study fluvial responses to periods of drying and climatic fluctuations during the Late Triassic Period, through detailed mapping of the Chinle Formation. In September, 2017, they measured and photographed sections of this formation in the NCA and collected small samples for X-ray diffraction analyses. Their research is supported by the Japan Society for the Promotion of Science.



# 5 Resources, Objects, Values, and Stressors

The Congressionally-defined purposes for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at sec. 1974(a), are:

*To conserve, protect, and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area; and*

*To protect each species that is located in the National Conservation Area; and listed as threatened or endangered...under the Endangered Species Act of 1973*

The BLM has identified a number of natural and cultural resources within the NCA that are unique and scientifically important, including:

- Massive exposures of the Jurassic age Kayenta Formation and Navajo Sandstone that preserve scientifically important dinosaur tracks and trackways, bone beds, plant fossils, and silicified wood;
- Rich ecological diversity resulting from the convergence of three major ecoregions: the Mojave Desert, Colorado Plateau and Great Basin;
- Critical habitats that sustain high densities of the threatened desert tortoise and other Mojave Desert species;
- Critical habitat for the endangered Shivwits milkvetch, a small native plant that grows only in Washington County on specific soil types;
- The Virgin River, Quail, and Leeds Creeks that provide aquatic habitat for the threatened and endangered native fish of the Virgin River system;
- Riparian zones along these streams that support diverse native species and migratory birds;
- Scenic landscapes of the Red Mountain and Cottonwood Canyon Wilderness areas that provide outstanding opportunities for solitude, natural quiet, primitive and unconfined recreation, and high quality wilderness experiences;
- Archaeological sites that preserve evidence of Archaic, Ancestral Puebloan, and Southern Paiute occupations and land uses;
- Mid-19th century and later historic period sites and features relating to the Euro-American settlement of southern Utah, including wagon roads, irrigation systems, farmsteads, mining sites, and the early 20th century Arrowhead Trails Highway.



The Red Cliffs NCA resources are significant from a regional and national perspective because they afford:

- Opportunities for scientific study of Early and Middle Jurassic age paleo-environments;
- Opportunities for conservation, protection, restoration, scientific study, public use and interpretation of an array of Jurassic-age paleontological resources, including scientifically important plant fossils, bone beds, and track sites;
- Opportunities for restoration of critical habitats for the threatened Mojave desert tortoise and other at-risk native species of this ecoregion.
- Opportunities for restoration and protection of crucial seasonal ranges and migration corridors for mule deer;
- Opportunities to reintroduce native desert bighorn sheep to former habitats in the Red Mountain and Cottonwood Canyon Wilderness areas;
- Opportunities for scientific research in City Creek and Paradise Canyon, where research on the Mojave desert tortoise has been ongoing since the 1950s;
- Opportunities for solitude, natural quiet, dark night skies, primitive and unconfined recreation in the Red Mountain and Cottonwood Canyon Wilderness areas, just minutes from the largest cities in Washington County;
- Opportunities for conservation, protection, restoration, scientific study, public use and interpretation of an array of prehistoric and historic period archaeological sites, documenting the broad span of human history in southwestern Utah;
- Opportunities for sustainable outdoor recreation on public lands that enhance the quality of life for local residents and visitors and help to sustain the economic health of local communities;
- Opportunities for broad-based scientific, academic, and community partnerships, volunteer programs, youth and veteran training and employment initiatives, developed to enhance public appreciation and citizen stewardship of the NCA resources and values.

As benchmarks have not yet been established through a Science Plan, the following assessment focuses on those resources for which status and trend are currently being monitored in the NCA.

# Ecological Resources

## Native Upland Vegetation Communities

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors affecting upland vegetation communities in the NCA. Late successional blackbrush formerly covered nearly 65% of the NCA land base. Over the past 20 years, wild fires fueled by exotic brome grasses have burned or re-burned a majority of this community; many re-burn areas have converted to exotic annual grasslands. This community will not re-establish as a mature shrubland for centuries, if ever.

Status of Native Upland Vegetation		Trend	
Fair to Good, depending on fire history		Stable in unburned areas	
Inventory, Assessment, Monitoring of Native Upland Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object by Community	Acres Monitored in FY17
44,909	34,400	Creosote:3,068 Blackbrush:22,390 Pinyon-juniper:3,719 Desert Sand Sage:1,586 Warm-Season Grassland:118 Big Sagebrush:3,061	Creosote: 1,500 Blackbrush: 1,000 Pinyon-juniper: 0 Desert Sand Sage: 0 Warm-Season Grassland-0 Big Sagebrush-0

## Montane Riparian, Warm Desert Riparian and Riparian Wash Vegetation

Riparian vegetation occurs in montane, warm desert, and riparian washes in the NCA, as mapped by The Nature Conservancy at a detailed scale in 2011 during the

Landscape Conservation Forecasting Process. Species that typify the riparian communities include mesquite, native willows, and Fremont's cottonwood; montane riparian areas include velvet ash, native willows, and cottonwood, but lack mesquite.

Status of Riparian Vegetation		Trend	
Good		Stable	
Inventory, Assessment, Monitoring of Riparian Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	Montane Riparian:40 Warm Desert Riparian:160 Riparian Wash:402	Montane Riparian:40 Warm Desert Riparian:160 Riparian Wash:402	Warm Desert Riparian:10 Riparian Wash:25

## Stressors Affecting Ecological Resources

*Native Upland Vegetation Communities:* Wildfires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors affecting all upland vegetation communities. Mojave Desert shrublands, including mature blackbrush stands, in particular, have been most severely impacted, as species in this community are not fire adapted and will not re-establish for decades or generations. In the past decade, wild fires, fueled by exotic annual brome grasses, have burned or re-burned 25% of this community.

### Montane Riparian, Warm Desert Riparian and Riparian Wash Vegetation:

Riparian vegetation in the NCA along Quail and Leeds Creeks, the Virgin River, and some ephemeral drainages is being impacted by episodic flooding and infestations of salt cedar (*Tamarisk* spp.) and Russian olive have invaded the riparian areas and compete with native species.

## Scenic Resources

The Red Cliffs NCA sits astride a transition zone between two major physiographic provinces, the Great Basin section of the Basin and Range Province and the Colorado Plateau, where geological processes have created a highly scenic area that, for most visitors, typifies the rugged and beautiful American Southwest. The landscapes of the east and south sides of the NCA are visible from Interstate I-15, beginning near Leeds and extending through downtown St. George, a scenic 14 mile stretch. These are landscapes of dramatic contrasts, with jet-black basalt flows ending abruptly against orange-red Navajo sandstone cliffs. The western boundary of the NCA is formed by the massive sandstone cliffs of the Red Mountain Wilderness, creating a spectacular backdrop for the cities of Ivins and Santa Clara. The natural character of the NCA landscapes contrast sharply with the highly modified human environment just outside its boundaries.

The pristine quality of the visual resources in many portions of the NCA is reflective of its rugged and relatively undeveloped nature. There are however, some areas of development are within its boundaries. Cottonwood Road is one of the primary roadways through the heart of the NCA and is paralleled and crossed by power transmission lines; a substation and other utility infrastructure are visible along the roadway. These intrusions into the landscape give this area an industrial feel that seems strangely out of place in a generally natural and undeveloped landscape. A Visual Resource Inventory (VRI) was completed for the NCA that rated the scenic qualities of the NCA, according the four classes used by the BLM's Visual Resource Management System.

Status of Scenic Resources	Trend
Good	Stable

Inventory, Assessment, Monitoring of Scenic Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object Based on VRI Inventory	Acres Monitored in FY17
44,909	44,859	VRM Class I-20,766 VRM Class II-8,971 VRM Class III-15,027 VRM 4 Class IV-145	44,909

### Stressors Affecting Scenic Resources

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors that directly affect the scenic qualities of the NCA. In 2005-2006, catastrophic fires burned or re-burned nearly 25% of the central and northern portions of the NCA. As Mojave Desert shrubs are not fire-adapted species, the fire scars will remain visible for decades. A number of power transmission lines and water pipelines cross the NCA, generally paralleling Cottonwood Road, the only major roadway through the core of the NCA. Should some of these transmission lines be upgraded to larger pole sizes or new roads and highways be authorized through this core area of the NCA, the scenic qualities would be impaired to a much greater extent than the current situation.

### Wildlife: Threatened and Endangered Species

Because the NCA lies within a transition zone between three eco-regions, it provides a mosaic of habitats for diverse wildlife species, some at the extremes of their historic ranges. Such species tend to have less stable populations than those closer to the center of their range. The NCA provides critical habitat for the threatened Mojave desert tortoise and data is collected on its population trends and habitat conditions by the BLM and UDWR. The Southwestern willow flycatcher and Western yellow-billed cuckoo are currently listed under the protection of the Endangered Species Act and have the potential to occur in the NCA. The Virgin River chub (*Gila seminude*) and woundfin (*Plagopterus argentissimus*), both endangered native fish of the Virgin River system, are found in the reach of the river that flows through the NCA.



## Mojave Desert Tortoise

The desert tortoise is a long-lived “indicator species” that is useful for evaluating the health of the Mojave Desert ecosystem. Over millions of years of evolution, the species has successfully adapted to changing environmental conditions and has been able to flourish, even in the highly variable and harsh environment of the Mojave Desert.

Status of Tortoise Critical Habitat		Trend	
Fair to Good, depending upon location and fire history		Stable in unburned areas Declining in fire-impacted areas	
Status of Tortoise Populations		Trend	
Fair		Increasing	
Inventory, Assessment, Monitoring Table of Tortoise Critical Habitat			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	30,281	25,350	400

## Stressors Affecting Mojave Desert Tortoise

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors affecting critical habitat for the Mojave desert tortoise. The creosote bush-white bursage community comprises a majority of the tortoise critical habitat. This community has not been significantly damaged by recent wildfires, but remains at high risk because of invasive brome grasses that carry fire. Late successional blackbrush formerly covered nearly 65% of the NCA land base. Over the past 20 years, wild fires, fueled by exotic brome grasses, have burned or re-burned a majority of this community, converting many re-burn areas to exotic invasive grasslands. When tortoises, particularly juveniles, consume brome grasses and other exotic species, they suffer nutritional deficiencies that impair their growth and

reproductive success. Invasive grasslands provide inadequate shade cover for tortoises, increasing for mortalities due to exposure to summer heat and predation.

### **Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Both of these birds are riparian obligates that depend on healthy riparian areas with dense stands of willows and cottonwood trees for nesting and foraging. Suitable habitat for these species is present along the Virgin River, Quail and Leeds Creeks, and in some ephemeral washes in the NCA.

Status of Riparian Habitat for T&E Birds		Trend	
Good		Stable	
Status of Flycatcher and Cuckoo Bird Populations		Trend in NCA	
Declining across range		Unknown	
Inventory, Assessment, Monitoring Table: Riparian Habitat for T&E Birds			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	600	600	50

### **Stressors Affecting Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Habitat loss to infestations of invasive species, such as giant reed (*Arundo donax*) and salt cedar, that degrade riparian areas are the principal stressors on these species. Prolonged droughts and predicted weather fluctuations could also impact the survival of willows and cottonwood trees that are important for nesting and foraging.

## Virgin River Chub and Woundfin

Native fish of the Virgin River system are federally-listed under the ESA and generally at risk, due to declining populations and loss of habitat. Both the Virgin River Chub and woundfin (shown in photo), are endangered species and found in the approximately 6 mile reach of the Virgin River that flows through the NCA.



Status of Critical Habitat for T&E Fish		Trend	
Declining		Stable in NCA	
Status of Virgin River Chub and Woundfin Populations		Trend	
Declining		Stable in NCA	
Inventory, Assessment, Monitoring Table of Critical Fish Habitat in Virgin River			
Acres in Unit	River miles inventoried	River Miles Possessing Object	Miles Monitored in FY17
44,909	6	6	6

## Stressors Affecting Virgin River Chub and Woundfin

Threats to both native fish include competition with non-native fish and habitat degradation, resulting from dams or diversions that have been constructed on the Virgin River, outside of the boundaries of the NCA, that elevate water temperatures beyond the tolerance of the fish. Downstream fish barriers protect this reach, by preventing non-native fish from moving up the stream channel. Prolonged droughts and predicted drought that result in increased ambient temperatures would be expected to negatively impact these native fish, as water temperatures in the river

would likely rise beyond the tolerance of both species.

## **Native Plants: Threatened and Endangered Species**

### **Shivwits Milkvetch (*Astragalus ampullariodes*)**

This small native plant grows only in Washington County and has been listed as an endangered species since 2006. Two of the six known plant populations are located within the NCA. Shivwits milkvetch has very specific habitat requirements, growing only in the purple-hued, gypsum rich soils, within the boundaries of the Red Cliffs Recreation Area. All areas that support Shivwits milkvetch populations in the NCA are fenced to protect the plants and their habitat.

Status of Shivwits Milkvetch			Trend
Declining			Stable in NCA
Inventory, Assessment, Monitoring of Shivwits Milkvetch			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	3,000	422	422

### **Stressors Affecting Shivwits Milkvetch**

Exotic invasive annuals and predicted drought are the primary stressors on Shivwits milkvetch and its designated critical habitat in the NCA. This habitat is primarily located in the creosote bush-white bursage community and is at some risk of impacts from wildfires because invasive annual brome grasses are present throughout this community. Recent modeling scenarios conducted for nearby Zion National Park indicated that predicated increases in ambient air temperature could impact the survival of the Shivwits milkvetch and other endemic native plant species whose habitats are localized to specific soil types with limited geographical distributions.

## Recreation Resources

The mild climate of southwestern Utah allows for enjoyable outdoor recreation opportunities in the NCA during all but the hottest months of summer. The NCA is literally within the “backyards” of residential subdivisions in Ivins, Santa Clara, St. George, and Washington City and receives intensive local community recreation use.

With 81 designated trails and routes of varying length and difficulty, hiking, mountain biking, and horseback riding are popular activities in the NCA. Because federal, state, municipal, and private lands are all encompassed within the boundaries of the NCA, many of the trails cross jurisdictional boundaries. All the trails, with the exception of those in designated wilderness, have been signed and all major roads leading into the NCA have portal signs. There are 35 trailheads where visitors can enter the NCA and park a vehicle. Primary trailheads typically include vault toilets, kiosks, interpretive panels, directional signs, and fences.

Recreational opportunities are locally well known and the NCA does attract visitors from outside the region; however, a majority of the recreational use is by local residents. Visitor use has increased in concert with regional population growth: in FY17, the estimated number of visits was 181,000, with the estimated number of visitor days at 56,724.

Eighteen Special Recreation Permits (SRPs) are authorized for commercial activities in the NCA. Services proved by the SRP holders include guided hiking, equestrian trail rides, mountain biking, and rock climbing.

The Red Cliffs Recreation Area is a fee site within the NCA that includes an 11 site developed campground, day use area, a non-motorized trail system, and interpreted public use sites. These include a 10<sup>th</sup> century Ancestral Puebloan habitation site, Jurassic age dinosaur trackways, the 1863 Orson B. Adams House, an historic structure that has been rehabilitated to Secretary of the Interior Standards, and the partial standing walls of a 1950's era movie set for the major Hollywood film *They Came to Cordura*. In FY17, the Recreation Area received 48,856 visits and 9,700 visitor days.

Status of Recreation Resources	Trend



Good			Stable
<b>Inventory, Assessment, Monitoring of Recreation Resources</b>			
<b>Acres in Unit</b>	<b>Acres Inventoried</b>	<b>Acres Possessing Object</b>	<b>Acres Monitored in FY17</b>
44,909	44,859	44,909	44,909

### **Stressors Affecting Recreation Resources**

Recreational resources and opportunities may be affected by any of the stressors that impact other resource values, as visitors to the NCA typically expect to see healthy native vegetation, diverse wildlife, and unspoiled scenic vistas. Unmanaged recreational uses can not only impact natural and cultural resources, but also result in damage to developed recreation facilities and impair the quality of visitor experiences. Conflicts can develop among recreational user groups, when popular trails must be shared by mountain bikers, hikers, and equestrians. High visitor numbers can be primary stressors on resource values and the quality of recreational experiences in designated wilderness areas. Visitors who seek wilderness experiences will generally expect to enjoy opportunities for solitude and natural quiet in these areas.

### **Cultural and Historical Resources**

Diverse cultural groups have used the landscape of the NCA over the broad expanse of human history; evidence of this use is preserved in prehistoric and historic period archeological sites and as Traditional Cultural Properties, Native American Sacred Sites, and cultural landscapes. The material culture of ancient Native American cultures, including Archaic peoples, Ancestral Puebloans and later Ancestral Numic-speaking groups, is found in campsites, rock shelters, and occupation sites. As the NCA land base has not been fully inventoried to identify its prehistoric cultural resources, sites will continue to be documented and many will be of significant scientific value.

Red Reef Shelter is located above Quail Creek, in an area where aboriginal groups could have hunted big game and collected native plants. The shelter preserves evidence of use by Ancestral Puebloan groups that includes rock imagery (pictographs and petroglyphs), artifacts, and midden deposits. In 2017, a surface charcoal sample from the shelter was radio-carbon dated at 1760 years before present +/- 30 years.

During the 1960s, this shelter was a "party" spot for local young people, as it was located along a popular hiking trail. An archeological site record completed in 1966 reported extensive charcoal, chalk, and crayon graffiti on the walls, some of it overlying the aboriginal pictographs and petroglyphs. In 2012, rock art specialists from Western Rock Art Research updated the site record and assisted the BLM Archeologist to remove graffiti near the rock art imagery; no efforts were made to remove the charcoal graffiti that directly overlies many of the pictographs. Since the graffiti removal, trained volunteer site stewards, NCA Park Rangers, and BLM Law Enforcement Rangers have conducted regular monitoring patrols of the site. The graffiti removal and regular patrols have dramatically reduced the incidences of new graffiti in the shelter. However, the charcoal graffiti that overlies many of the pictographs requires the



services of a professional rock art conservator to remove.

In FY16, SUNCLF assisted the BLM by contracting a professional rock art conservator to prepare a Conservation Needs Assessment for the Red Reef Shelter and a second damaged rock art site in the NCA. The Needs Assessment identified the conservation measures that a rock art conservator could employ to address the remaining

charcoal graffiti in Red Reef Shelter and the damage to the second site. In July of 2017, the BLM contracted the services of a professional rock art conservator and remediation work on both sites will begin during the spring of 2018.

The NCA is within the traditional homeland of the Southern Paiute people, who hunted, collected native plants, and cultivated crops along Quail and Leeds Creeks. In the mid-19<sup>th</sup> century, Mormon colonists displaced the Southern Paiute and established the

agricultural settlements of Harrisburg and Leeds, along these same creeks. The NCA preserves the rock walls, ditches, and agrarian fields of Harrisburg and two of its farmsteads: the Orson B. Adams house and farmstead and the ruins of the Willard McMullin farmstead.

In the 1870s, rich silver deposits were discovered in sandstone formations, locally called “reefs”, near Harrisburg. The Harrisburg mining district was organized and word of the deposits caused a rush of miners, mill workers, merchants, and saloon operators to a newly- established mining camp at Silver Reef, north of Harrisburg. The silver boom continued until just after the turn of century, so miner’s prospects, adits, and shafts abound along the White and East Reefs in the NCA.



Today, a majority of the historic silver mines are abandoned and have been gated or backfilled, to protect public safety. During this fiscal year, NCA staff monitored 12 abandoned mines, to ensure the integrity of the closures.

Status of Cultural and Historical Values			Trend
Good			Stable
Inventory, Assessment, Monitoring of Cultural and Historical Resources			
Total Acres of Unit	Acres Inventoried	Acres Inventoried in FY17	Sites Monitored in FY17
44,909	8,100	10	25

### Stressors Affecting Cultural and Historical Resources

Stressors on cultural and historical resources include natural processes, such as wind and water erosion, and human-caused impacts, such as vandalism or visitation of

sites that are not managed for or “hardened” for public use. Wildfires can destroy historic wooden structures or features, while the loss of vegetative cover can accelerate soil erosion that also damages site integrity.

## **Natural Resources: Geological and Paleontological Resources; Cave and Karst Values**

To date, inventories conducted in the NCA have identified 46 scientifically significant paleontological localities. A majority of the localities are dinosaur tracks and trackways, including swim tracks with claw marks, fossilized skeletal remains, and coprolites. These localities are in the Triassic Chinle Formation, Triassic-Jurassic Moenave Formation, and the Jurassic Kayenta Formation, all of which have high potential for scientifically significant paleontological resources. Paleontologists have also documented localities with fossilized plant remains of scientific importance. There is a potential for the Quaternary and Tertiary Formations to include vertebrate fossils in rock alcoves and unconsolidated fill.

Vertebrate trace fossils have been found in the Jurassic-age Navajo, Kayenta, and Moenave Formations in the NCA. Particularly well-preserved dinosaur tracks have been identified in the Red Cliffs Recreation Area and in Babylon/East Reef area.

The Chinle Formation, Moenave Formation, and Springdale Member of the Kayenta Formation preserve fossilized vertebrate skeletal remains in the NCA. Bones from phytosaurs (long-snouted crocodile-like reptiles) and metoposaurs (large crocodile-like amphibians) have been recovered from the Chinle Formation. Bones and scales from fossil freshwater fish fauna, including shark, lungfish, and coelacanth, have been identified from the Whitmore Point Member of the Moenave Formation.

Silicified or “petrified” wood occurs in many areas of the NCA. Although some petrified wood has been found in the Triassic Moenkopi Formation, the Springdale Member of the Kayenta Formation, and the Cretaceous Iron Springs Formation, the greatest concentration of the petrified wood is present in the Triassic Chinle Formation.

Status of Paleontological Resources	Trend
Good	Stable

Inventory, Assessment, Monitoring of Paleontological Resources			
Total Acres of Unit	Acres Inventoried through Potential Fossil Yield Evaluations	Localities Recorded in FY17	Localities Monitored in FY17
44,909	200	0	5

While the geologic formations of the Red Cliffs NCA are not those that typically erode into caves and karsts, there are large natural rock arches and alcoves that provide habitat for bats and that contain evidence use by prehistoric and historic period human groups. In some cases, abandoned mine adits in the White and East Reef areas of the NCA provide roosting sites for diverse bat species. Natural geologic features, such as rock shelters and alcoves, are documented through the Cave and Karst Management Program and through the Cultural Resources Program, when these features contain archeological materials.

Status of Cave, Karst, Alcoves, and Mine Values				Trend
Good				Stable
Inventory, Assessment, Monitoring of Cave and Karst Values				
Total Acres of Unit	Acres Previously Inventoried	Acres Inventoried in FY17	Caves and Shelters Recorded in FY17	Caves and Shelters Monitored in FY17
44,909	220	10	0	2



## Natural Resources: Wilderness

### Designated Wilderness

In 2009, through OPLMA, Title 1, Subtitle O, at sec.1972, the Cottonwood Canyon and Red Mountain Wilderness areas were added to the National Wilderness Preservation System and the Secretary of the Interior, through BLM, directed to administer each area in accordance with the Wilderness Act (16 U.S.C. 1131 et seq.). Approximately 19,989 acres of the two designated wilderness areas are within the boundaries of the NCA. The characteristics of wilderness, including size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined recreation, are present in both areas.

Both wilderness areas are close to St. George, Ivins, Santa Clara, Washington City, and Hurricane and easily accessed via paved roads. They are, therefore, popular hiking and equestrian trail riding destinations for locals and visitors to the area. In FY17, Cottonwood Canyon Wilderness received 57,949 visits and 14,507 visitor days, while Red Mountain Wilderness received 13,891 visits and 3,455 visitor days.

Status of Designated Wilderness			Trend
Good			Stable
Inventory, Assessment, and Monitoring of Designated Wilderness			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	44,909	19,989	19,989

### Lands with Wilderness Characteristics

The naturalness of the NCA, outside of designated wilderness, can be inferred from the results of inventories completed by BLM for the presence or absence of wilderness characteristics. These characteristics include size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined

recreation. Between 2012 and 2014, NCA staff completed inventories for lands with wilderness characteristics in the NCA and found that three areas, totaling 1,586 acres, possessed those characteristics.

Status of Lands with Wilderness Characteristics			Trend
Good			Stable
Inventory, Assessment, and Monitoring of Lands with Wilderness Characteristics			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	44,859	1,586	1,586

### Stressors Affecting Naturalness

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors that have the potential to impact the naturalness of the NCA. Increasing recreational uses, particularly if not properly managed, would also have the potential to impact its natural qualities, if these uses damage resource values and degrade the quality of visitor experiences.

## 6 Summary of Performance Measure

The Congressionally-defined purposes for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at section 1974 are:

*(1) To conserve, protect and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area. (2) To protect each species that is located in the National Conservation Area; and listed as threatened or endangered...under the Endangered Species Act of 1973*

Summary Table*		
Resource, Object, or Value	Status	Trend
Ecological/Native Vegetation	Fair to Good	Variable by Veg. Community
Scenic	Good	Stable
Wildlife and Plants: Threatened or Endangered Species	Fair to Good	Variable by Species
Recreation Resources	Good	Stable
Cultural and Historical	Good	Stable
Natural: Geological/Paleontological/Caves, Shelters, and Karsts	Good	Stable
Natural: Wilderness	Good	Stable
Educational	Good	Stable
Scientific	Good	Stable

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## Manager's Letter

Dear Friends of the Red Cliffs NCA;

The Manager's Annual Report highlights just a few of the projects that we completed this year in the Red Cliffs NCA. Our efforts were furthered by contributions from many dedicated volunteers, community partners, researchers, and members of the public who support the conservation purposes of the NCA.

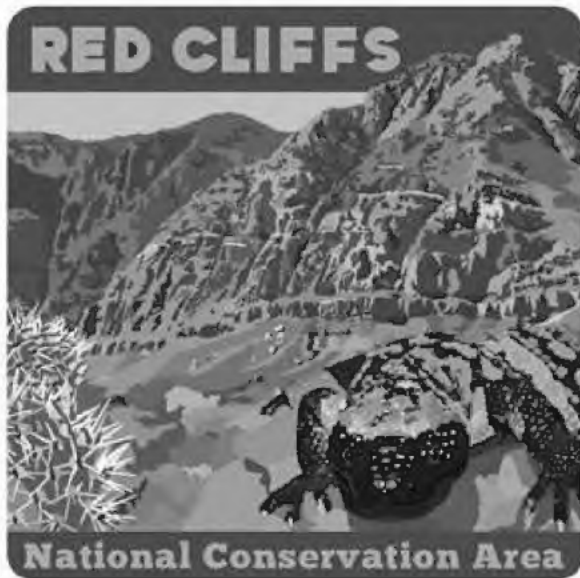
This year we were able to complete the Red Cliffs NCA RMP and have the Record of Decision signed in December. We appreciate the input provided by the public, other Federal and State agencies, and the Cooperating Agencies that helped us to develop a plan that will conserve, protect, and restore the resource values of the NCA. We are now moving forward to implement the management actions approved in the new RMP. During the upcoming year, our focus will also be on the following:

- Engaging the public and soliciting input from all affected parties on the Draft Comprehensive Travel and Transportation Management Plan for Washington County when it is released;
- Supporting the local and regional economy, through the granting of Special Recreation Permits for commercial recreational activities that are compatible with the purposes of the NCA;
- Supporting scientific research that increases the understanding of the resources and values of the NCA;
- Providing environmental education outreach and engaging students of all ages in NCA projects and research studies; and
- Fostering new opportunities for volunteers of all ages to help us further the conservation purpose of the NCA.

We thank you for your interest in and support of the Red Cliffs NCA.

Sincerely,





**Bureau of Land Management-Utah  
St. George Field Office  
Public Lands Information Center  
345 E. Riverside Drive  
St. George, UT 84790  
Phone: (435)-688-3200**



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# **Red Cliffs National Conservation Area**

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## **Annual Manager's Report—Fiscal Year 2017**

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# 1 Red Cliffs NCA Profile

## Designating Authority

The designating authority for the Red Cliffs National Conservation Area (NCA) is the *Omnibus Public Land Management Act* of 2009 (Public Law 111-11, hereinafter OPLMA) at Title I, Subtitle O, Washington County, Utah, sec. 1974.

**Date of Designation:** March 30, 2009

## Acreage

The Red Cliffs NCA boundary encompasses approximately 61,218 total acres.

Total Acres in Unit	BLM Acres	Other Fed. Acres	State Acres	Other Acres
61,218	44,909	0	13,727	2,582

## Contact Information

Unit Manager	Phone	E-mail	Mailing Address
Dawna Ferris-Rowley	435-688-3216	d8ferris@blm.gov	Public Lands Information Center 345 E. Riverside Dr. St. George, UT 84790

Field Office	District Office	State Office
St. George Field Office	Color Country District	Utah State Office



# Red Cliffs National Conservation Area



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## Budget

Total FY17 Budget	Sub-activity 1711	Other Sub-activities Contributions	Other Funding
\$ 1,000,005	\$380,000	\$625,000	N/A

## Managing Partners

N/A

## Staffing

The Red Cliffs NCA shares management and staff with the Beaver Dam Wash NCA, also administered by the St. George Field Office (SGFO). The NCA Manager supervises the following positions that comprise the permanent, full-time staff for the two NCAs: Archeologist; Archeological Technician; Biologist; GIS Specialist; Landscape Architect; two Outdoor Recreation Planners, and two Park Rangers. The NCA staff also supports the SGFO, performing work in their areas of expertise on public lands outside of the two NCAs. On average, approximately 40% of NCA staff time is devoted to projects and work in the NCAs, the remainder for work on other public lands managed by SGFO. Other BLM programs, such as Outdoor Recreation, Wilderness, and Threatened and Endangered Species management, provide funding for salaries and other costs for work done by NCA staff outside of the NCAs.

As examples of the support that the NCA staff provides to the SGFO, in January of 2017, the NCA Biologist assumed responsibility for the biological and botanical resources programs for the SGFO, when a retirement left the Field Office Biologist position vacant. The NCA biologist continued in that role throughout the fiscal year, while also performing collateral duties as the NEPA Coordinator for the NCAs and the SGFO.

The NCA Landscape Architect provides contract and facilities design support to all programs managed by the SGFO and develops multi-media interpretive products for the NCAs and SGFO. The NCA Archeologist and Archeological Technician support the management of cultural resources on public lands outside the NCAs and host a



volunteer site stewardship program that provides regular monitoring of at-risk archeological sites on all public lands in Washington County. One of the NCA Outdoor Recreation Planners continues to perform collateral duties as the point of contact for the Wilderness Management Program and the Visual Resource Management Program for the SGFO and serves as the project lead for the OPLMA-mandated Comprehensive Travel and Transportation Management Plan for all public lands in Washington County. The second NCA Outdoor Recreation Planner manages the Special Recreation Permit (SRP) program for NCAs and the SGFO. He is also the point of contact for the Caves and Karst Management for the NCAs and the SGFO and continues to have collateral duties as BLM-Utah's State Program Lead for the Cave and Karst Management Program.

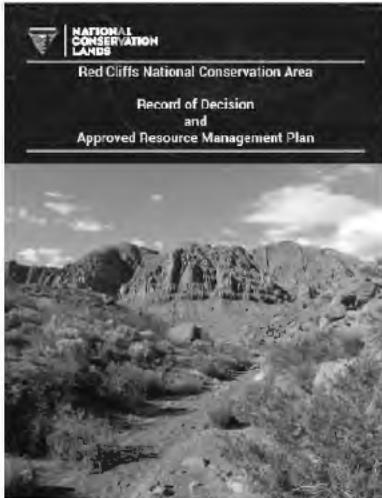
Administrative, Lands and Realty, and Natural Resources staff from the SGFO provided services that supported management of the NCA. The Color Country District Office, located in Cedar City, Utah, provided Fire Management (Suppression), Engineering, Force Account, and Budget services. Two BLM Law Enforcement Rangers, based in St. George, conducted regular patrols in the NCAs. However, as they are shared District-wide resources, their availability for patrols in the NCAs was constrained by the need to support the SGFO and other Field Offices within the District.

### **Headquarters/Visitor Center**

The NCA Manager and staff are co-located in an Interagency Public Land Information Center Office in St. George, UT with management and staff from the SGFO, the BLM-Arizona Strip District Office, the Arizona Strip Field Office, and the Vermilion Cliffs National Monument. The Dixie-Arizona Strip Interpretive Association (DASIA) supports the management of the interagency Public Land Information Center, providing volunteers and staff to assist with public contacts.

## 2 Planning and NEPA

### Status of the Resource Management Plan



The *Red Cliffs National Conservation Area Record of Decision and Resource Management Plan* (RMP, 2016) is the new land use plan that provides for the long-term management of the NCA. The Record of Decision (ROD), which approved the RMP, was signed by the BLM-Utah State Director on December 21, 2016. The ROD and Approved RMP are available to the public online as a PDF document at: [goo.gl/stvqfS](http://goo.gl/stvqfS).

#### Protests on the Resource Management Plan

Early in FY17, the NCA Manager and staff assisted the BLM Director's Office in Washington D.C. to review 21 protest letters received during the protest period on the Proposed RMP/Final Environmental Impact Statement (FEIS) that ended on October 3, 2016. Entities that participated in the planning process with interests that might be adversely affected by the approval of the RMP are eligible to file protests. After careful consideration of all the points raised in the protests, the BLM Director concluded that the BLM planning team and decision makers followed all applicable laws, regulations, policies, and pertinent resource considerations in developing the Proposed RMP/FEIS. Thus, the protest review did not result in any changes to the Proposed RMP.

The signing of the ROD by the BLM-Utah State Director served as the final decision by the Department of the Interior for all land use planning level decisions included in the Approved RMP.

#### IBLA Appeals on the Resource Management Plan

Washington County, the Washington County Water Conservancy District, and the City of St. George collectively filed an appeal with the IBLA (IBLA 2017-101) on January 22, 2017 regarding the RMP decision to manage 38,472 acres of the Red Cliffs NCA as an Exclusion area to new rights-of-way (ROWs) and 6,367 acres as ROW Avoidance area. On April 28, 2017, the IBLA issued an Order dismissing this appeal.

## **Status of the RMP Implementation Strategy**

The NCA Manager and staff began drafting an Implementation Strategy for the new RMP in FY17 but expect that it will not be completed until after the approval of a OPLMA-directed Comprehensive Travel and Transportation Management Plan (TMP) for public lands in Washington County. The TMP is a high priority planning effort that will continue to require a major commitment of time from the NCA and SGFO management and staff in FY18.

## **Status of Activity Plans**

### **Comprehensive Travel and Transportation Management Plan**

The NCA Manager and staff continued work on the TMP. An Environmental Assessment to support the TMP is currently in review by BLM staff. The NCA GIS Specialist is assisting the BLM's National Operations Center in the development of software that will facilitate the receipt and analysis of public comments on the TMP, once the draft is released for public review and comment.

The NCA Manager and Archeologist initiated consultation under Section 106 of the National Historic Preservation Act for the TMP with the Utah State Historic Preservation Officer and culturally-affiliated American Indian Tribes, including the Shivwits Band of the Paiute Indian Tribe of Utah, the Paiute Indian Tribe of Utah, the Kaibab Paiute Tribe, the Hopi Tribe, and the Navajo Nation. As required by 36CFR 800.3 (f), interested parties were identified and nine parties were invited to participate as formal consulting parties in the Section 106 process. Three of the parties (Southern Utah Wilderness Alliance, The LDS Church, and the Utah Rock Art Research Association) agreed to participate. Consulting parties met on April 26, 2017 to discuss the area of potential effects (APE) for the TMP and the BLM's efforts to identify historic properties (i.e., archeological sites listed to or eligible for listing to the National Register of Historic Places) within the APE. Identification efforts will include intensive pedestrian Class III-level cultural resource inventories within the APE.

### **Key National Environmental Policy Act Actions and/or Project Authorizations**

Completion of the ROD/Approved RMP was the key NEPA action for the NCA during this fiscal year.

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# 3 Year's Projects and Accomplishments

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## General Accomplishments

### Fire-Damaged Habitat Restoration Research

Since 2015, the Utah Partners for Conservation and Development have benefited from Utah Watershed Restoration Initiative funding to support a multi-year experimental habitat restoration research program in fire-damaged Mojave desert tortoise (*Gopherus agassizii*) critical habitat. Project sites are located in both the Red Cliffs and Beaver Dam Wash NCAs, based on a joint proposal submitted by the Utah Division of Wildlife Resources (UDWR) and the BLM. This research has also received funding from multiple sources, including the U.S. Fish and Wildlife Service (USFWS), The Nature Conservancy, the National Fish and Wildlife Service Foundation, and Washington County, bringing the total contributed to this research to over \$100,000.

As re-seeding has proven to be generally unsuccessful as a restoration method in the arid Mojave Desert, this program will research the effectiveness of out-planting mature, nursery grown containerized native species on a large scale, with the goal of re-establishing shrubs, forbs, and grasses that are beneficial to desert tortoise and other wildlife. The Department of Restoration Ecology at the University of Nevada, Las Vegas (UNLV) propagated 5,000 mature containerized plants from locally sourced seeds for habitat restoration in the NCA.

Biologists and botanists from the BLM, UDWR, the USFWS, and UNLV selected a 100-acre site in the NCA. A GPS-based grid was established on this site with smaller research plots located within that grid. Native vegetation species and exotic and invasive annual grasses and forbs were documented for each plot.

In November of 2016, 1,000 one-gallon sized containerized plants were planted in the restoration site. They included four native species: brittlebush (*Encelia farinose*;  $n = 250$ ), white bursage (*Ambrosia dumosa*;  $n = 250$ ), big galleta (*Pleuraphis rigida*;  $n = 250$ ), and desert globemallow (*Sphaeralcea ambigua*;  $n = 250$ ). The planting plan identified low density plots, in which 15 plants were planted in 25 plots, and high density plots in which 25 plants were planted in 25 plots. Protective chicken wire cages were placed around all plants within odd numbered plots. First year survivorship counts are being

conducted by UDWR at this time and the data are currently being compiled.

### **Current Area of Focus**

Having just completed a new RMP for the Red Cliffs NCA, the NCA Manager and staff are beginning to implement decisions from that plan. A recently-contracted Interpretive Concept Design Plan will help to identify important themes for the NCA and guide the content, media, and location for interpretation of those themes.

The NCA Manager continues to serve on Washington County's Habitat Conservation Plan Advisory Committee, an inter-agency group that makes recommendation to the Washington County Commission regarding matters related to the County's Habitat Conservation Plan for the Mojave desert tortoise. A current focus for this group is making needed revisions to the Habitat Conservation Plan (HCP), based on changed circumstances, including the designation of the Red Cliffs NCA in 2009 and the BLM's approval of a new RMP for the NCA. Another revision to the HCP being considered is the management of other lands that support desert tortoise populations as satellite mitigation reserves in support of Washington County's Incidental Take Permit.

## **Education, Outreach, and Interpretation**

### **Environmental Education**

In November, the NCA Biologist provided in-the-field environmental education opportunities for high school students attending the Green Wood Charter School. Students learned about by the Mojave Desert, fire ecology, and the life history of the Mojave desert tortoise and other native species. They had the opportunity to conduct a survey with the NCA Biologist to look for desert tortoise burrows, scat or other tortoise evidence. Their final learning experience was to form teams and construct chicken wire cages to protect the native plants being planted in the habitat restoration research site. The photos below show the students learning about the life history of the horned lizard, shown in middle photo, and surveying for wildlife with the NCA Biologist.





The NCA staff again provided curriculum-based learning experiences for Washington County middle school students during two “Day in the Desert” field days, held annually in the spring and fall, in the Red Cliffs Recreation Area. As one of the learning activities, the NCA Archeologist instructed students about prehistoric Native American hunting technologies. Students then practiced their skills at hitting a life-sized image of an American bison with a wooden spear, using replicas of an atlatl spear-throwing device, shown in the photo at left.

Other learning experiences offered by NCA staff included a hands-on examination of aquatic invertebrates in Quail Creek and the use of GPS units for navigation.

In September of 2017, the NCA Park Ranger and Biologist conducted a guided night hike in the NCA’s Red Cliffs Recreation Area, as one of the events offered during the first-ever regional Southwest Astronomy Festival. The hike began at dusk in the Recreation Area campground, where participants learned about stars, planets, and constellations that were prominent in the night sky and how light pollution impaired dark night skies and stargazing. The NCA Biologist then described nocturnal animal species, their adaptations (e.g., vision, hearing), foraging, and hunting strategies. Participants hiked along the Red Reef East Trail, where the NCA staff used black light

flashlights to locate scorpions (see photos below). They also demonstrated how mobile bat acoustical monitoring equipment, with identification software, could record bat calls and identify of the species by its echolocation call signature. The photo on the far right below shows the call spectrogram of a Big Brown Bat (*Eptesicus fuscus*).



## Outreach

### International Visitor Leadership Program Visit and Panel Discussion

On August 29, 2017, the NCA Manager conducted a field visit to the Red Cliffs Recreation Area for six international visitors, invited to the United States under the auspices of the U.S. State Department's International Visitor Leadership Program. The Utah Council for Citizen Diplomacy arranged the itinerary and contacts for their visit in Utah to highlight the range of services, infrastructure, and education outreach in U.S. National Parks and protected areas and foster discussions among field experts and local communities on the roles of governments and the private sector in parks management, biodiversity preservation, and tourism development.

The six visitors were from Montenegro, Poland, Portugal, Slovenia, Suriname, and Turkey and each held a leadership role in the management of national parks, forests, and other protected areas in their respective countries. During the visit to the Red Cliffs Recreation Area, the NCA Manager described the resources and values of the NCA, the management of the campground and day use areas, the levels of visitation, as well as funding, staffing, visitor services, and other topics of interest to the six international visitors.

Following the site visit, the international visitors participated in a panel discussion with various stakeholders, including the NCA Manager and representatives from Washington County, the State of Utah, the City of St. George, and Snow Canyon State

Park, in St. George. The discussions focused on how federal, state, and local governments in Washington County work together to balance the needs of the environment, communities, and development. The six international visitors described their leadership responsibilities and compared how issues of managing protected lands in their respective countries differed from those in the United States.

## **Interpretation**

In FY17, the BLM contracted with Sea Reach, a firm with over 30 years of experience writing interpretive plans, to prepare an Interpretive Concept Design Plan for the NCA. Sea Reach personnel joined the NCA Manager and staff for a tour of the NCA in July and will facilitate workshops with the NCA staff, various stakeholders, and partner groups in October 2017 to identify themes that should be interpreted for the NCA.

## **Partnerships**

### **Southern Utah National Conservation Lands Friends (SUNCLF)**

The Southern Utah National Conservation Lands Friends (SUNCLF), a 501 (c) (3) non-profit “friends” group, continues to support BLM’s management of the Red Cliffs NCA, through a Cooperative Assistance Agreement. SUNCLF assists BLM with volunteer stewardship programs, environmental education outreach, and special projects. In FY17, SUNCLF provided information about the NCA at local events, such as “Take it Outdoors Day” and “Junior Ranger Day”, and helped to recruit volunteers to assist with the habitat restoration project in the NCA.





In the photo, Washington County middle school students learn about traditional Native American uses of native plants for food, medicine, and fiber from the SUNCLF Public Lands Coordinator, during the “Day in the Desert” learning activities, held in the Red Cliffs Recreation Area.

### **Dixie-Arizona Strip Interpretive Association (DASIA)**

Outreach for the NCA is also provided by Dixie-Arizona Strip Interpretive Association (DASIA), also a 501 (c) (3) not-for-profit group, through a Cooperative Assistance Agreement with BLM. DASIA recruits volunteers who assist with public contacts and visitor services in the interagency Public Lands Information Center in St. George, UT and with special projects.

### **Song Dog Native Plant Nursery, Lake Mead National Recreation Area**

In FY17, the BLM signed a new Inter/Intra-Agency Agreement with the National Park Service’s (NPS) Lake Mead National Recreation Area to grow containerized native plants for habitat restoration projects in the NCA. The NPS Song Dog Native Plant Nursery staff have many years of experience propagating Mojave Desert species and large-scale facilities in which to grow mature plants.

## **Volunteers**

Volunteers donated more than 2,000 hours of time to the conservation and protection of resource values in the NCA. As examples:

- Twenty-five Trail Stewards, hosted by Washington County HCP Administrator’s Office, regularly patrolled more than 130 miles of designated non-motorized trails in the NCA, making visitor contacts and documenting trail conditions; in FY17, these volunteers donated more than 1600 hours of volunteer time.
- Trained Site Stewards donated more than 250 hours, monitoring 25 archeological and paleontological sites in the NCA.

- Volunteers recruited by The Nature Conservancy and SUNCLF donated more than 160 hours, helping to plant native species and make plant cages, in support of a habitat restoration project.

### **Land (or Interests in Land) Acquisitions**

No land or interests in land were acquired during this fiscal year.



# 4 Science

## Science Plan

The Red Cliffs NCA does not yet have a formal Science Plan. However, some of the opportunities for research that would inform the long-term management of the NCA are identified in the ROD and Approved RMP and will be included in a future Science Plan. In FY17, the BLM, other partners, and academic researchers holding valid NCA Scientific Research Permits conducted the following scientific studies:

*BLM: Mojave Desert Tortoise Study to Compare Satellite Tag versus VHF Transmitter Use for Home Range Monitoring.*



The NCA Biologist, assisted by a UDWR biologist, deployed a MicroGPS +H Iridium Satellite Tag on a desert tortoise, to determine the efficacy of Satellite Tag versus VHF transmitter use for home range monitoring. This device, shown attached to the tortoise in the photo, is next-generation wildlife tracking technology that uses

Iridium's 66 low-Earth orbiting cross-linked satellites to capture/store highly accurate coordinate data. Current tortoise monitoring involves locating VHF telemetered tortoises two to three times a week in the field. When Satellite Tags are used, tagged tortoises need to be located only once per month for health assessments, which represents a significant labor and cost savings. The programmable satellite tags are able to collect and store a great quantity/variety of data, thereby increasing monitoring capabilities. Long-term monitoring is critical to assess density and abundance of the Mojave desert tortoise within the NCA, and to evaluate progress being made toward meeting recovery goals for the species.

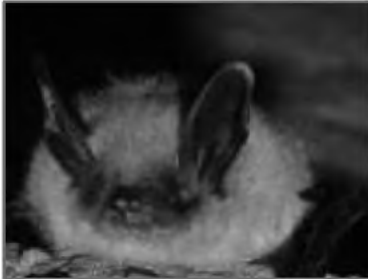
## BLM: Distribution/Abundance/Monitoring Studies for Gila Monster



During this fiscal year, the NCA Biologist established a new study program for Gila Monster (*Heloderma suspectum*), a BLM Sensitive Species, within two 100-acre study areas in the NCA. The Utah population of the Gila Monster only occurs in Washington County, and has seen rapid population declines since the 1990s, due principally to habitat loss to development on private and state lands. Additional threats to the species include road mortality, poaching (illegal collection/trade), increasing exposure to domestic predators (dogs/cats), and prolonged periods of drought. Wildland fires on public lands, fueled by invasive annual grasses, have impacted habitat and the prey base of this large reptile, in the NCA. The goals of this new study program are to determine the current distribution, abundance, age structure, diet, home range, and habitat use of a sufficient sample of subpopulations of Gila Monsters in the habitat within the NCA to reliably estimate current status and viability. This information will provide a baseline from which to evaluate future trends and attainment of NCA/BLM Sensitive Species management goals. The photos below clearly show that each Gila Monster has unique markings, making it possible to distinguish individuals within the study populations.



## BLM: Bat Monitoring Studies



Data on bat distribution, numbers, trends, and ecology are currently very limited for Washington County, Utah, where habitat for bats and other wildlife is rapidly being lost to development. Eighteen species of bats have been identified in Utah, but data on which of those species occur in Washington County is incomplete. In 2015, the BLM initiated monitoring studies in the NCA and elsewhere on public lands in the County, to collect data on bat species and distributions, using permanent and mobile acoustical devices.



In 2017, the NCA staff stationed a permanent ultrasonic bat recorder in the abandoned Thomson/Cobb mine, shown in the photo at left, to collect long term monitoring data on bat populations in the mine. An infrared motion-activated camera was installed in the mine, to capture photographic images of bats, and to aid in species identification. In three areas of the mine where bats roost, temperature and relative humidity data loggers were installed, allowing the development of an ambient temperature profile that may facilitate the identification of bat roosting locations in other mines.

The NCA staff inventoried three other abandoned mines in the NCA, to determine if bats were using the mines. The inventories confirmed that two of the abandoned mines were providing habitat of Townsend big-eared (*Corynorhinus townsendii*) and Fringed myotis (*Myotis thysandes*) bats, both BLM Sensitive Species.

The NCA Biologist, assisted by two Biological Resource Associates from ACE, recorded bat calls in the Red Cliffs Recreation Area and along the Virgin River, using handheld ultrasonic bat recorders with species identification software, hosted on iPads. The software provides real time species identification of the recorded bat calls. Data on bat species identified, location, date, ecological setting, and meteorological conditions collected by the permanent and mobile recorders are stored in a geodatabase in GIS. Using these data, models can be created for species and habitat distribution and

diversity. Acoustical monitoring studies have verified that 16 or the 18 bat species identified in Utah are found in the NCA, including a number of BLM Sensitive Species.

### **UDWR: Southwestern Willow Flycatcher (*Empidonax traillii extimus*) and Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) Monitoring**

Avian biologists with UDWR conducted annual monitoring studies along the Virgin River through the NCA for evidence of these riparian obligate species that are both now federally-listed species. Monitoring studies attempt to determine if either species is present in this reach of the river and to identify any foraging and nesting locations. To date, neither species has been observed in the riparian area along the Virgin River in the NCA. Funding for these studies is provided by the inter-agency Virgin River Recovery Program and the Washington County Habitat Conservation Plan (HCP).

### **UDWR: Bi-annual Tortoise Monitoring**

Between April 3 and June 16, 2017, biological field teams from the UDWR conducted bi-annual desert tortoise monitoring, using line distance sampling transects to detect tortoises and sign within approximately 300 acres of the NCA. The objectives of this monitoring program, funded by Washington County's HCP, are to estimate trends in adult tortoise populations within the multi-jurisdictional 62,000 acre Red Cliffs Desert Reserve (Reserve). Protective management of the Reserve's land base serves as the primary mitigation for the County's Incidental Take Permit, issued by the USFWS in 1996 to provide for orderly growth and development on private lands in critical tortoise habitat in Washington County. The Red Cliffs NCA comprises approximately 70% of the land base of the Reserve. Bi-annual monitoring of tortoise populations by UDWR have been ongoing in the Reserve since the County received its Incidental Take Permit and provide valuable data on tortoise populations trends.

The number of tortoises detected during the 2017 monitoring was higher than the previous years (e.g., 2015, 2013). The increase in tortoise numbers may be attributable to the higher than average levels of precipitation that fell during the winter and early spring months in the NCA, supporting the growth of annual and perennial plants that benefit tortoise survival and reproductive success.



### **Southern Utah University: Recreational Use Impact Monitoring**

Students from Southern Utah University, under the direction of Dr. Bridget Eastep, conducted annual field monitoring to identify recreational use impacts in the Red Cliffs Recreation Area, the Babylon Area, and along non-motorized trails in tortoise designated critical habitat within the NCA. Any new social trails and dispersed camping sites are documented through GPS locations and photographs. This annual monitoring program is funded by Washington County's HCP and data provided to the multi-jurisdictional land managers of the County's mitigation reserve, of which the NCA comprises 70% of the land base.

### **Southern Utah University: Ant Studies**

In October, students from Southern Utah University, under the direction of Dr. Carrie Jo Bucklin, Assistant Professor of Biology, collected ant species from 30 locations within the NCA. This collection, and others from locations in Iron and Kane Counties, will be used to create an ant biodiversity map for southern Utah. The hypothesis for this study is that the species and frequencies of ant populations will be different at different elevations due to different abiotic factors. Some of ants collected will also be analyzed for genetic variation among species. The results of this study are expected to be published in 2018.

### **Brigham Young University: Studies on status of the dragonfly species "*Aeshna persephone*" in Utah**

In June, Alan Myrup and Dr. Seth Bybee from Brigham Young University collected adult and nymph voucher specimens of the dragonfly species "*Aeshna persephone*" from along Quail Creek in the NCA, the only known location where *A. persephone* and another dragonfly species, *Aeshna palmate*, co-occur without apparent hybridization. The researchers are attempting to determine the phylogeny of dragonflies belonging to the "paddle-tailed" group of the Genus *Aeshna*, using DNA sequencing as well as the morphology of adults and nymphs. This study will compare specimens of *A. persephone* collected from the NCA, Zion National Park, and the Grand Staircase-Escalante National Monument to specimens from Arizona and New Mexico. A



phylogenetic tree illustrating the relationships among these species and analysis of the findings of this study are expected to be published in 2019.

### **Chiba University, Yokosuka City Museum: Fluvial Response to Climatic Fluctuation, based on outcrop mapping of the Chinle Formation**

Geologists Kenichiro Shibata and Makoto Ito from the Yokosuka City Museum, Kanagawa, Japan, were granted an NCA Science Research Permit to study fluvial responses to periods of drying and climatic fluctuations during the Late Triassic Period, through detailed mapping of the Chinle Formation. In September, 2017, they measured and photographed sections of this formation in the NCA and collected small samples for X-ray diffraction analyses. Their research is supported by the Japan Society for the Promotion of Science.



# 5 Resources, Objects, Values, and Stressors

The Congressionally-defined purposes for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at sec. 1974(a), are:

*To conserve, protect, and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area; and*

*To protect each species that is located in the National Conservation Area; and listed as threatened or endangered...under the Endangered Species Act of 1973*

The BLM has identified a number of natural and cultural resources within the NCA that are unique and scientifically important, including:

- Massive exposures of the Jurassic age Kayenta Formation and Navajo Sandstone that preserve scientifically important dinosaur tracks and trackways, bone beds, plant fossils, and silicified wood;
- Rich ecological diversity resulting from the convergence of three major ecoregions: the Mojave Desert, Colorado Plateau and Great Basin;
- Critical habitats that sustain high densities of the threatened desert tortoise and other Mojave Desert species;
- Critical habitat for the endangered Shivwits milkvetch, a small native plant that grows only in Washington County on specific soil types;
- The Virgin River, Quail, and Leeds Creeks that provide aquatic habitat for the threatened and endangered native fish of the Virgin River system;
- Riparian zones along these streams that support diverse native species and migratory birds;
- Scenic landscapes of the Red Mountain and Cottonwood Canyon Wilderness areas that provide outstanding opportunities for solitude, natural quiet, primitive and unconfined recreation, and high quality wilderness experiences;
- Archaeological sites that preserve evidence of Archaic, Ancestral Puebloan, and Southern Paiute occupations and land uses;
- Mid-19th century and later historic period sites and features relating to the Euro-American settlement of southern Utah, including wagon roads, irrigation systems, farmsteads, mining sites, and the early 20th century Arrowhead Trails Highway.

The Red Cliffs NCA resources are significant from a regional and national perspective because they afford:

- Opportunities for scientific study of Early and Middle Jurassic age paleo-environments;
- Opportunities for conservation, protection, restoration, scientific study, public use and interpretation of an array of Jurassic-age paleontological resources, including scientifically important plant fossils, bone beds, and track sites;
- Opportunities for restoration of critical habitats for the threatened Mojave desert tortoise and other at-risk native species of this ecoregion.
- Opportunities for restoration and protection of crucial seasonal ranges and migration corridors for mule deer;
- Opportunities to reintroduce native desert bighorn sheep to former habitats in the Red Mountain and Cottonwood Canyon Wilderness areas;
- Opportunities for scientific research in City Creek and Paradise Canyon, where research on the Mojave desert tortoise has been ongoing since the 1950s;
- Opportunities for solitude, natural quiet, dark night skies, primitive and unconfined recreation in the Red Mountain and Cottonwood Canyon Wilderness areas, just minutes from the largest cities in Washington County;
- Opportunities for conservation, protection, restoration, scientific study, public use and interpretation of an array of prehistoric and historic period archaeological sites, documenting the broad span of human history in southwestern Utah;
- Opportunities for sustainable outdoor recreation on public lands that enhance the quality of life for local residents and visitors and help to sustain the economic health of local communities;
- Opportunities for broad-based scientific, academic, and community partnerships, volunteer programs, youth and veteran training and employment initiatives, developed to enhance public appreciation and citizen stewardship of the NCA resources and values.

As benchmarks have not yet been established through a Science Plan, the following assessment focuses on those resources for which status and trend are currently being monitored in the NCA.

# Ecological Resources

## Native Upland Vegetation Communities

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors affecting upland vegetation communities in the NCA. Late successional blackbrush formerly covered nearly 65% of the NCA land base. Over the past 20 years, wild fires fueled by exotic brome grasses have burned or re-burned a majority of this community; many re-burn areas have converted to exotic annual grasslands. This community will not re-establish as a mature shrubland for centuries, if ever.

Status of Native Upland Vegetation		Trend	
Fair to Good, depending on fire history		Stable in unburned areas	
Inventory, Assessment, Monitoring of Native Upland Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object by Community	Acres Monitored in FY17
44,909	34,400	Creosote:3,068 Blackbrush:22,390 Pinyon-juniper:3,719 Desert Sand Sage:1,586 Warm-Season Grassland:118 Big Sagebrush:3,061	Creosote: 1,500 Blackbrush: 1,000 Pinyon-juniper: 0 Desert Sand Sage: 0 Warm-Season Grassland-0 Big Sagebrush-0

## Montane Riparian, Warm Desert Riparian and Riparian Wash Vegetation

Riparian vegetation occurs in montane, warm desert, and riparian washes in the NCA, as mapped by The Nature Conservancy at a detailed scale in 2011 during the

Landscape Conservation Forecasting Process. Species that typify the riparian communities include mesquite, native willows, and Fremont's cottonwood; montane riparian areas include velvet ash, native willows, and cottonwood, but lack mesquite.

Status of Riparian Vegetation		Trend	
Good		Stable	
Inventory, Assessment, Monitoring of Riparian Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	Montane Riparian:40 Warm Desert Riparian:160 Riparian Wash:402	Montane Riparian:40 Warm Desert Riparian:160 Riparian Wash:402	Warm Desert Riparian:10 Riparian Wash:25

## Stressors Affecting Ecological Resources

*Native Upland Vegetation Communities:* Wildfires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors affecting all upland vegetation communities. Mojave Desert shrublands, including mature blackbrush stands, in particular, have been most severely impacted, as species in this community are not fire adapted and will not re-establish for decades or generations. In the past decade, wild fires, fueled by exotic annual brome grasses, have burned or re-burned 25% of this community.

### Montane Riparian, Warm Desert Riparian and Riparian Wash Vegetation:

Riparian vegetation in the NCA along Quail and Leeds Creeks, the Virgin River, and some ephemeral drainages is being impacted by episodic flooding and infestations of salt cedar (*Tamarisk* spp.) and Russian olive have invaded the riparian areas and compete with native species.



## Scenic Resources

The Red Cliffs NCA sits astride a transition zone between two major physiographic provinces, the Great Basin section of the Basin and Range Province and the Colorado Plateau, where geological processes have created a highly scenic area that, for most visitors, typifies the rugged and beautiful American Southwest. The landscapes of the east and south sides of the NCA are visible from Interstate I-15, beginning near Leeds and extending through downtown St. George, a scenic 14 mile stretch. These are landscapes of dramatic contrasts, with jet-black basalt flows ending abruptly against orange-red Navajo sandstone cliffs. The western boundary of the NCA is formed by the massive sandstone cliffs of the Red Mountain Wilderness, creating a spectacular backdrop for the cities of Ivins and Santa Clara. The natural character of the NCA landscapes contrast sharply with the highly modified human environment just outside its boundaries.

The pristine quality of the visual resources in many portions of the NCA is reflective of its rugged and relatively undeveloped nature. There are however, some areas of development are within its boundaries. Cottonwood Road is one of the primary roadways through the heart of the NCA and is paralleled and crossed by power transmission lines; a substation and other utility infrastructure are visible along the roadway. These intrusions into the landscape give this area an industrial feel that seems strangely out of place in a generally natural and undeveloped landscape. A Visual Resource Inventory (VRI) was completed for the NCA that rated the scenic qualities of the NCA, according the four classes used by the BLM's Visual Resource Management System.

Status of Scenic Resources	Trend
Good	Stable

Inventory, Assessment, Monitoring of Scenic Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object Based on VRI Inventory	Acres Monitored in FY17
44,909	44,859	VRM Class I-20,766 VRM Class II-8,971 VRM Class III-15,027 VRM 4 Class IV-145	44,909

### Stressors Affecting Scenic Resources

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors that directly affect the scenic qualities of the NCA. In 2005-2006, catastrophic fires burned or re-burned nearly 25% of the central and northern portions of the NCA. As Mojave Desert shrubs are not fire-adapted species, the fire scars will remain visible for decades. A number of power transmission lines and water pipelines cross the NCA, generally paralleling Cottonwood Road, the only major roadway through the core of the NCA. Should some of these transmission lines be upgraded to larger pole sizes or new roads and highways be authorized through this core area of the NCA, the scenic qualities would be impaired to a much greater extent than the current situation.

### Wildlife: Threatened and Endangered Species

Because the NCA lies within a transition zone between three eco-regions, it provides a mosaic of habitats for diverse wildlife species, some at the extremes of their historic ranges. Such species tend to have less stable populations than those closer to the center of their range. The NCA provides critical habitat for the threatened Mojave desert tortoise and data is collected on its population trends and habitat conditions by the BLM and UDWR. The Southwestern willow flycatcher and Western yellow-billed cuckoo are currently listed under the protection of the Endangered Species Act and have the potential to occur in the NCA. The Virgin River chub (*Gila seminude*) and woundfin (*Plagopterus argentissimus*), both endangered native fish of the Virgin River system, are found in the reach of the river that flows through the NCA.

## Mojave Desert Tortoise

The desert tortoise is a long-lived “indicator species” that is useful for evaluating the health of the Mojave Desert ecosystem. Over millions of years of evolution, the species has successfully adapted to changing environmental conditions and has been able to flourish, even in the highly variable and harsh environment of the Mojave Desert.

Status of Tortoise Critical Habitat		Trend	
Fair to Good, depending upon location and fire history		Stable in unburned areas Declining in fire-impacted areas	
Status of Tortoise Populations		Trend	
Fair		Increasing	
Inventory, Assessment, Monitoring Table of Tortoise Critical Habitat			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	30,281	25,350	400

## Stressors Affecting Mojave Desert Tortoise

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors affecting critical habitat for the Mojave desert tortoise. The creosote bush-white bursage community comprises a majority of the tortoise critical habitat. This community has not been significantly damaged by recent wildfires, but remains at high risk because of invasive brome grasses that carry fire. Late successional blackbrush formerly covered nearly 65% of the NCA land base. Over the past 20 years, wild fires, fueled by exotic brome grasses, have burned or re-burned a majority of this community, converting many re-burn areas to exotic invasive grasslands. When tortoises, particularly juveniles, consume brome grasses and other exotic species, they suffer nutritional deficiencies that impair their growth and

reproductive success. Invasive grasslands provide inadequate shade cover for tortoises, increasing for mortalities due to exposure to summer heat and predation.

### **Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Both of these birds are riparian obligates that depend on healthy riparian areas with dense stands of willows and cottonwood trees for nesting and foraging. Suitable habitat for these species is present along the Virgin River, Quail and Leeds Creeks, and in some ephemeral washes in the NCA.

Status of Riparian Habitat for T&E Birds		Trend	
Good		Stable	
Status of Flycatcher and Cuckoo Bird Populations		Trend in NCA	
Declining across range		Unknown	
Inventory, Assessment, Monitoring Table: Riparian Habitat for T&E Birds			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	600	600	50

### **Stressors Affecting Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Habitat loss to infestations of invasive species, such as giant reed (*Arundo donax*) and salt cedar, that degrade riparian areas are the principal stressors on these species. Prolonged droughts and predicted weather fluctuations could also impact the survival of willows and cottonwood trees that are important for nesting and foraging.

## Virgin River Chub and Woundfin

Native fish of the Virgin River system are federally-listed under the ESA and generally at risk, due to declining populations and loss of habitat. Both the Virgin River Chub and woundfin (shown in photo), are endangered species and found in the approximately 6 mile reach of the Virgin River that flows through the NCA.



Status of Critical Habitat for T&E Fish		Trend	
Declining		Stable in NCA	
Status of Virgin River Chub and Woundfin Populations		Trend	
Declining		Stable in NCA	
Inventory, Assessment, Monitoring Table of Critical Fish Habitat in Virgin River			
Acres in Unit	River miles inventoried	River Miles Possessing Object	Miles Monitored in FY17
44,909	6	6	6

## Stressors Affecting Virgin River Chub and Woundfin

Threats to both native fish include competition with non-native fish and habitat degradation, resulting from dams or diversions that have been constructed on the Virgin River, outside of the boundaries of the NCA, that elevate water temperatures beyond the tolerance of the fish. Downstream fish barriers protect this reach, by preventing non-native fish from moving up the stream channel. Prolonged droughts and predicted drought that result in increased ambient temperatures would be expected to negatively impact these native fish, as water temperatures in the river



would likely rise beyond the tolerance of both species.

## **Native Plants: Threatened and Endangered Species**

### **Shivwits Milkvetch (*Astragalus ampullariodes*)**

This small native plant grows only in Washington County and has been listed as an endangered species since 2006. Two of the six known plant populations are located within the NCA. Shivwits milkvetch has very specific habitat requirements, growing only in the purple-hued, gypsum rich soils, within the boundaries of the Red Cliffs Recreation Area. All areas that support Shivwits milkvetch populations in the NCA are fenced to protect the plants and their habitat.

Status of Shivwits Milkvetch			Trend
Declining			Stable in NCA
Inventory, Assessment, Monitoring of Shivwits Milkvetch			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	3,000	422	422

### **Stressors Affecting Shivwits Milkvetch**

Exotic invasive annuals and predicted drought are the primary stressors on Shivwits milkvetch and its designated critical habitat in the NCA. This habitat is primarily located in the creosote bush-white bursage community and is at some risk of impacts from wildfires because invasive annual brome grasses are present throughout this community. Recent modeling scenarios conducted for nearby Zion National Park indicated that predicated increases in ambient air temperature could impact the survival of the Shivwits milkvetch and other endemic native plant species whose habitats are localized to specific soil types with limited geographical distributions.

## Recreation Resources

The mild climate of southwestern Utah allows for enjoyable outdoor recreation opportunities in the NCA during all but the hottest months of summer. The NCA is literally within the “backyards” of residential subdivisions in Ivins, Santa Clara, St. George, and Washington City and receives intensive local community recreation use.

With 81 designated trails and routes of varying length and difficulty, hiking, mountain biking, and horseback riding are popular activities in the NCA. Because federal, state, municipal, and private lands are all encompassed within the boundaries of the NCA, many of the trails cross jurisdictional boundaries. All the trails, with the exception of those in designated wilderness, have been signed and all major roads leading into the NCA have portal signs. There are 35 trailheads where visitors can enter the NCA and park a vehicle. Primary trailheads typically include vault toilets, kiosks, interpretive panels, directional signs, and fences.

Recreational opportunities are locally well known and the NCA does attract visitors from outside the region; however, a majority of the recreational use is by local residents. Visitor use has increased in concert with regional population growth: in FY17, the estimated number of visits was 181,000, with the estimated number of visitor days at 56,724.

Eighteen Special Recreation Permits (SRPs) are authorized for commercial activities in the NCA. Services provided by the SRP holders include guided hiking, equestrian trail rides, mountain biking, and rock climbing.

The Red Cliffs Recreation Area is a fee site within the NCA that includes an 11 site developed campground, day use area, a non-motorized trail system, and interpreted public use sites. These include a 10<sup>th</sup> century Ancestral Puebloan habitation site, Jurassic age dinosaur trackways, the 1863 Orson B. Adams House, an historic structure that has been rehabilitated to Secretary of the Interior Standards, and the partial standing walls of a 1950's era movie set for the major Hollywood film *They Came to Cordura*. In FY17, the Recreation Area received 48,856 visits and 9,700 visitor days.

Status of Recreation Resources	Trend

Good			Stable
<b>Inventory, Assessment, Monitoring of Recreation Resources</b>			
<b>Acres in Unit</b>	<b>Acres Inventoried</b>	<b>Acres Possessing Object</b>	<b>Acres Monitored in FY17</b>
44,909	44,859	44,909	44,909

### **Stressors Affecting Recreation Resources**

Recreational resources and opportunities may be affected by any of the stressors that impact other resource values, as visitors to the NCA typically expect to see healthy native vegetation, diverse wildlife, and unspoiled scenic vistas. Unmanaged recreational uses can not only impact natural and cultural resources, but also result in damage to developed recreation facilities and impair the quality of visitor experiences. Conflicts can develop among recreational user groups, when popular trails must be shared by mountain bikers, hikers, and equestrians. High visitor numbers can be primary stressors on resource values and the quality of recreational experiences in designated wilderness areas. Visitors who seek wilderness experiences will generally expect to enjoy opportunities for solitude and natural quiet in these areas.

### **Cultural and Historical Resources**

Diverse cultural groups have used the landscape of the NCA over the broad expanse of human history; evidence of this use is preserved in prehistoric and historic period archeological sites and as Traditional Cultural Properties, Native American Sacred Sites, and cultural landscapes. The material culture of ancient Native American cultures, including Archaic peoples, Ancestral Puebloans and later Ancestral Numic-speaking groups, is found in campsites, rock shelters, and occupation sites. As the NCA land base has not been fully inventoried to identify its prehistoric cultural resources, sites will continue to be documented and many will be of significant scientific value.

Red Reef Shelter is located above Quail Creek, in an area where aboriginal groups could have hunted big game and collected native plants. The shelter preserves evidence of use by Ancestral Puebloan groups that includes rock imagery (pictographs and petroglyphs), artifacts, and midden deposits. In 2017, a surface charcoal sample from the shelter was radio-carbon dated at 1760 years before present +/- 30 years.

During the 1960s, this shelter was a "party" spot for local young people, as it was located along a popular hiking trail. An archeological site record completed in 1966 reported extensive charcoal, chalk, and crayon graffiti on the walls, some of it overlying the aboriginal pictographs and petroglyphs. In 2012, rock art specialists from Western Rock Art Research updated the site record and assisted the BLM Archeologist to remove graffiti near the rock art imagery; no efforts were made to remove the charcoal graffiti that directly overlies many of the pictographs. Since the graffiti removal, trained volunteer site stewards, NCA Park Rangers, and BLM Law Enforcement Rangers have conducted regular monitoring patrols of the site. The graffiti removal and regular patrols have dramatically reduced the incidences of new graffiti in the shelter. However, the charcoal graffiti that overlies many of the pictographs requires the



services of a professional rock art conservator to remove.

In FY16, SUNCLF assisted the BLM by contracting a professional rock art conservator to prepare a Conservation Needs Assessment for the Red Reef Shelter and a second damaged rock art site in the NCA. The Needs Assessment identified the conservation measures that a rock art conservator could employ to address the remaining

charcoal graffiti in Red Reef Shelter and the damage to the second site. In July of 2017, the BLM contracted the services of a professional rock art conservator and remediation work on both sites will begin during the spring of 2018.

The NCA is within the traditional homeland of the Southern Paiute people, who hunted, collected native plants, and cultivated crops along Quail and Leeds Creeks. In the mid-19<sup>th</sup> century, Mormon colonists displaced the Southern Paiute and established the

agricultural settlements of Harrisburg and Leeds, along these same creeks. The NCA preserves the rock walls, ditches, and agrarian fields of Harrisburg and two of its farmsteads: the Orson B. Adams house and farmstead and the ruins of the Willard McMullin farmstead.

In the 1870s, rich silver deposits were discovered in sandstone formations, locally called “reefs”, near Harrisburg. The Harrisburg mining district was organized and word of the deposits caused a rush of miners, mill workers, merchants, and saloon operators to a newly- established mining camp at Silver Reef, north of Harrisburg. The silver boom continued until just after the turn of century, so miner’s prospects, adits, and shafts abound along the White and East Reefs in the NCA.



Today, a majority of the historic silver mines are abandoned and have been gated or backfilled, to protect public safety. During this fiscal year, NCA staff monitored 12 abandoned mines, to ensure the integrity of the closures.

Status of Cultural and Historical Values			Trend
Good			Stable
Inventory, Assessment, Monitoring of Cultural and Historical Resources			
Total Acres of Unit	Acres Inventoried	Acres Inventoried in FY17	Sites Monitored in FY17
44,909	8,100	10	25

### Stressors Affecting Cultural and Historical Resources

Stressors on cultural and historical resources include natural processes, such as wind and water erosion, and human-caused impacts, such as vandalism or visitation of



sites that are not managed for or “hardened” for public use. Wildfires can destroy historic wooden structures or features, while the loss of vegetative cover can accelerate soil erosion that also damages site integrity.

## **Natural Resources: Geological and Paleontological Resources; Cave and Karst Values**

To date, inventories conducted in the NCA have identified 46 scientifically significant paleontological localities. A majority of the localities are dinosaur tracks and trackways, including swim tracks with claw marks, fossilized skeletal remains, and coprolites. These localities are in the Triassic Chinle Formation, Triassic-Jurassic Moenave Formation, and the Jurassic Kayenta Formation, all of which have high potential for scientifically significant paleontological resources. Paleontologists have also documented localities with fossilized plant remains of scientific importance. There is a potential for the Quaternary and Tertiary Formations to include vertebrate fossils in rock alcoves and unconsolidated fill.

Vertebrate trace fossils have been found in the Jurassic-age Navajo, Kayenta, and Moenave Formations in the NCA. Particularly well-preserved dinosaur tracks have been identified in the Red Cliffs Recreation Area and in Babylon/East Reef area.

The Chinle Formation, Moenave Formation, and Springdale Member of the Kayenta Formation preserve fossilized vertebrate skeletal remains in the NCA. Bones from phytosaurs (long-snouted crocodile-like reptiles) and metoposaurs (large crocodile-like amphibians) have been recovered from the Chinle Formation. Bones and scales from fossil freshwater fish fauna, including shark, lungfish, and coelacanth, have been identified from the Whitmore Point Member of the Moenave Formation.

Silicified or “petrified” wood occurs in many areas of the NCA. Although some petrified wood has been found in the Triassic Moenkopi Formation, the Springdale Member of the Kayenta Formation, and the Cretaceous Iron Springs Formation, the greatest concentration of the petrified wood is present in the Triassic Chinle Formation.

Status of Paleontological Resources	Trend
Good	Stable

Inventory, Assessment, Monitoring of Paleontological Resources			
Total Acres of Unit	Acres Inventoried through Potential Fossil Yield Evaluations	Localities Recorded in FY17	Localities Monitored in FY17
44,909	200	0	5

While the geologic formations of the Red Cliffs NCA are not those that typically erode into caves and karsts, there are large natural rock arches and alcoves that provide habitat for bats and that contain evidence use by prehistoric and historic period human groups. In some cases, abandoned mine adits in the White and East Reef areas of the NCA provide roosting sites for diverse bat species. Natural geologic features, such as rock shelters and alcoves, are documented through the Cave and Karst Management Program and through the Cultural Resources Program, when these features contain archeological materials.

Status of Cave, Karst, Alcoves, and Mine Values				Trend
Good				Stable
Inventory, Assessment, Monitoring of Cave and Karst Values				
Total Acres of Unit	Acres Previously Inventoried	Acres Inventoried in FY17	Caves and Shelters Recorded in FY17	Caves and Shelters Monitored in FY17
44,909	220	10	0	2

## Natural Resources: Wilderness

### Designated Wilderness

In 2009, through OPLMA, Title 1, Subtitle O, at sec.1972, the Cottonwood Canyon and Red Mountain Wilderness areas were added to the National Wilderness Preservation System and the Secretary of the Interior, through BLM, directed to administer each area in accordance with the Wilderness Act (16 U.S.C. 1131 et seq.). Approximately 19,989 acres of the two designated wilderness areas are within the boundaries of the NCA. The characteristics of wilderness, including size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined recreation, are present in both areas.

Both wilderness areas are close to St. George, Ivins, Santa Clara, Washington City, and Hurricane and easily accessed via paved roads. They are, therefore, popular hiking and equestrian trail riding destinations for locals and visitors to the area. In FY17, Cottonwood Canyon Wilderness received 57,949 visits and 14,507 visitor days, while Red Mountain Wilderness received 13,891 visits and 3,455 visitor days.

Status of Designated Wilderness			Trend
Good			Stable
Inventory, Assessment, and Monitoring of Designated Wilderness			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	44,909	19,989	19,989

### Lands with Wilderness Characteristics

The naturalness of the NCA, outside of designated wilderness, can be inferred from the results of inventories completed by BLM for the presence or absence of wilderness characteristics. These characteristics include size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined

recreation. Between 2012 and 2014, NCA staff completed inventories for lands with wilderness characteristics in the NCA and found that three areas, totaling 1,586 acres, possessed those characteristics.

Status of Lands with Wilderness Characteristics			Trend
Good			Stable
Inventory, Assessment, and Monitoring of Lands with Wilderness Characteristics			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
44,909	44,859	1,586	1,586

### Stressors Affecting Naturalness

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors that have the potential to impact the naturalness of the NCA. Increasing recreational uses, particularly if not properly managed, would also have the potential to impact its natural qualities, if these uses damage resource values and degrade the quality of visitor experiences.

## 6 Summary of Performance Measure

The Congressionally-defined purposes for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at section 1974 are:

*(1) To conserve, protect and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area. (2) To protect each species that is located in the National Conservation Area; and listed as threatened or endangered...under the Endangered Species Act of 1973*

Summary Table*		
Resource, Object, or Value	Status	Trend
Ecological/Native Vegetation	Fair to Good	Variable by Veg. Community
Scenic	Good	Stable
Wildlife and Plants: Threatened or Endangered Species	Fair to Good	Variable by Species
Recreation Resources	Good	Stable
Cultural and Historical	Good	Stable
Natural: Geological/Paleontological/Caves, Shelters, and Karsts	Good	Stable
Natural: Wilderness	Good	Stable
Educational	Good	Stable
Scientific	Good	Stable



7

## Manager's Letter

Dear Friends of the Red Cliffs NCA;

The Manager's Annual Report highlights just a few of the projects that we completed this year in the Red Cliffs NCA. Our efforts were furthered by contributions from many dedicated volunteers, community partners, researchers, and members of the public who support the conservation purposes of the NCA.

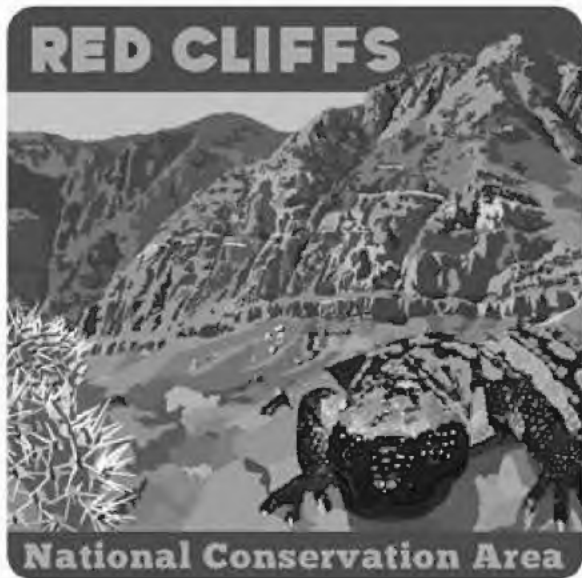
This year we were able to complete the Red Cliffs NCA RMP and have the Record of Decision signed in December. We appreciate the input provided by the public, other Federal and State agencies, and the Cooperating Agencies that helped us to develop a plan that will conserve, protect, and restore the resource values of the NCA. We are now moving forward to implement the management actions approved in the new RMP. During the upcoming year, our focus will also be on the following:

- Engaging the public and soliciting input from all affected parties on the Draft Comprehensive Travel and Transportation Management Plan for Washington County when it is released;
- Supporting the local and regional economy, through the granting of Special Recreation Permits for commercial recreational activities that are compatible with the purposes of the NCA;
- Supporting scientific research that increases the understanding of the resources and values of the NCA;
- Providing environmental education outreach and engaging students of all ages in NCA projects and research studies; and
- Fostering new opportunities for volunteers of all ages to help us further the conservation purpose of the NCA.

We thank you for your interest in and support of the Red Cliffs NCA.

Sincerely,





**Bureau of Land Management-Utah  
St. George Field Office  
Public Lands Information Center  
345 E. Riverside Drive  
St. George, UT 84790  
Phone: (435)-688-3200**



**NATIONAL  
CONSERVATION  
LANDS**

The mention of company names, trade names, or commercial products does not constitute endorsement or recommendation for use by the federal government.





**NATIONAL  
CONSERVATION  
LANDS**

Utah

# Beaver Dam Wash National Conservation Area



## Annual Manager's Report—Fiscal Year 2017

DOI-2021-03 02128

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# 1 Beaver Dam Wash NCA Profile

## Designating Authority

The designating authority for the Beaver Dam Wash National Conservation Area (NCA) is the *Omnibus Public Land Management Act* of 2009 (Public Law 111-11, hereinafter OPLMA) at Title I, Subtitle O, Washington County, Utah, sec. 1975. The designation was amended by a map included in the 2010 Interior and Environment Appropriations Bill Conference Agreement of October 2009 showing modifications to the boundaries that reduced the public land acreage of the NCA from approximately 68,083 acres to the current acreage of approximately 63,480 acres.

**Date of Designation:** March 30, 2009

## Acreage

Total Acres in Unit	BLM Acres	Other Fed. Acres	State Acres	Other Acres
72,097	63,478	0	6,492	2,127

## Contact Information

Unit Manager	Phone	E-mail	Mailing Address
Dawna Ferris-Rowley	435-688-3216	d8ferris@blm.gov	Public Lands Information Center 345 E. Riverside Dr. St. George, UT 84790

Field Office	District Office	State Office
St. George Field Office	Color Country District	Utah State Office





**NATIONAL  
CONSERVATION  
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Utah

# Beaver Dam Wash National Conservation Area

## Legend

- Climbing Area
- Point of Interest
- Historic Trail\*  
\*Historic trails are in approximate locations and are not hiking trails.
- Paved Road
- Unimproved Road
- National Conservation Area
- Wilderness Area

0 2.5 5 Miles



NEVADA

UTAH

Beaver Dam Wash  
Elevation 2,178ft  
Lowest Point in Utah

UTAH  
ARIZONA

Welcome Springs  
Climbing Area

Utah Hills  
Climbing Area

Joshua Tree  
National  
Natural Landmark

Woodbury Road  
Climbing Area

To Santa Clara/  
St George

OLD HIGHWAY 91

OLD HIGHWAY 91

To Beaver Dam

No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for use or for purposes not intended by BLM.

DOI-2021-03 02131

M14-09-01:2015

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## Budget

Total FY16 Budget	Sub-activity 1711	Other Sub-activities' Contributions	Other Funding
\$492,000	\$362,000	\$130,000	N/A

## Managing Partners

N/A

## Staffing

The Beaver Dam Wash Cliffs NCA shares management and staff with the Red Cliffs NCA, also administered by the St. George Field Office (SGFO). The NCA Manager supervises the following positions that comprise the permanent, full-time staff for the two NCAs: Archeologist; Archeological Technician; Biologist; GIS Specialist; Landscape Architect; two Outdoor Recreation Planners, and two Park Rangers. The NCA staff also supports the SGFO, performing work in their areas of expertise on public lands outside of the two NCAs. On average, approximately 40% of NCA staff time is devoted to projects and work in the NCAs, the remainder for work on public lands managed by SGFO. Other BLM programs, such as Outdoor Recreation, Rangeland Management, and Threatened and Endangered Species Management, provide funding for salaries and other costs for work done by NCA staff, both within and outside of the NCAs.

As examples of the support that the NCA staff provides to the SGFO, in January of 2017, the NCA Biologist assumed responsibility for the biological and botanical resources programs for the SGFO, when a retirement left the Field Office Biologist position vacant. The NCA biologist continued in that role throughout the fiscal year, while also performing collateral duties as the NEPA Coordinator for the NCAs and the SGFO.

The NCA Landscape Architect provides contract and facilities design support to all programs managed by the SGFO and develops multi-media interpretive products for the NCAs and SGFO. The NCA Archeologist and Archeological Technician support the management of cultural resources on public lands outside the NCAs and host a volunteer site stewardship program that provides regular monitoring of at-risk archeological sites on all public lands in Washington County. One of the NCA Outdoor Recreation Planners continues to perform collateral duties as the point of contact for the Wilderness Management Program and the Visual Resource Management Program for the SGFO and serves as the project lead for the OPLMA-mandated Comprehensive Travel and Transportation Management Plan for all public lands in Washington County. The second NCA Outdoor Recreation Planner manages the Special Recreation Permit (SRP) program for NCAs and the SGFO. He is also the point of contact for the Caves and Karst Management for the NCAs and the SGFO and continues to have collateral duties as BLM-Utah's State Program Lead for the Cave and Karst Management Program.

Administrative Support, Lands and Realty, or Rangeland Management Specialists from the SGFO provide support to the management of the NCA. The Color Country District Office, located in Cedar City, Utah, provides Fire Management (Suppression), Engineering, Force Account, and Budget services. Two BLM Law Enforcement Rangers, based in St. George, conduct patrols in the Beaver Dam Wash NCA. However, as they are shared District-wide resources, their availability for patrols in the NCA is constrained by the need to support the SGFO and other Field Offices within the District.

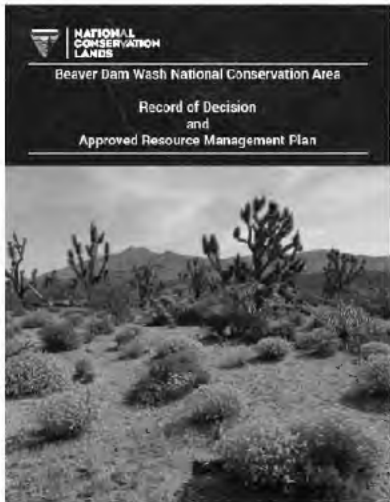
### **Headquarters/Visitor Center**

The NCA Manager and staff are co-located in an interagency Public Land Information Center Office in St. George, UT with management and staff from the SGFO, BLM-Arizona Strip District Office, the Arizona Strip Field Office, and the Vermilion Cliffs National Monument. The Dixie-Arizona Strip Interpretive Association (DASIA) supports the management of the interagency Public Land Information Center, providing volunteers and staff to assist with public contacts.



## 2 Planning and NEPA

### Status of the Resource Management Plan



The *Beaver Dam Wash National Conservation Area Record of Decision and Resource Management Plan* (RMP, 2016) now provides the goals, objectives, and decisions for the long-term management of resource values and land uses in the NCA. The BLM-Utah State Director signed the Record of Decision (ROD), approving the new RMP, on December 21, 2016. The ROD/Approved RMP are available online at: <https://goo.gl/6XcmBD>.

### Protests on the Resource Management Plan

Early in FY17, the NCA Manager and staff assisted the BLM Director's Office staff in the review of nine protest letters received during the 30-day protest period on the Proposed RMP/Final Environmental Impact Statement (FEIS). Entities that participated in the planning process with interests that might be adversely affected by the approval of the RMP are eligible to file protests. After careful consideration of all the points raised in the protests, the BLM Director concluded that the BLM planning team and decision makers followed all applicable laws, regulations, policies, and pertinent resource considerations in developing the Proposed RMP/FEIS. Thus, the protest review did not result in any changes to the Proposed RMP.

The approval of the ROD by the BLM-Utah State Director served as the final decision by the Department of the Interior for all land use planning level decisions included in the Approved RMP.

### IBLA Appeals on the Resource Management Plan

Washington County, the Washington County Water Conservancy District, and the City of St. George collectively filed an appeal with the IBLA (IBLA 2017-102) on January 22, 2017 regarding the RMP decision to manage 63,352 acres of the Beaver Dam Wash NCA as an Exclusion area to new rights-of-way (ROWS) and 128 acres as ROW Avoidance area. On April 28, 2017, the IBLA issued an Order dismissing this appeal.

## **Status of the RMP Implementation Strategy**

The NCA Manager and staff began drafting an Implementation Strategy for the new RMP in FY17 but expect that it will not be completed until after the approval of a OPLMA-directed Comprehensive Travel and Transportation Management Plan (TMP) for public lands in Washington County. The TMP is a high priority planning effort that will continue to require a major commitment of time from the NCA and SGFO management and staff in FY18.

## **Status of Activity Plans**

### **Comprehensive Travel and Transportation Management Plan (TMP)**

The NCA Manager and staff continued work on the TMP. An Environmental Assessment to support the TMP is currently in review by BLM staff. The NCA GIS Specialist is assisting the BLM's National Operations Center in the development of software that will facilitate the receipt and analysis of public comments on the TMP, once the draft is released for public review and comment.

The NCA Manager and Archeologist initiated consultation under Section 106 of the National Historic Preservation Act for the TMP with the Utah State Historic Preservation Officer and culturally-affiliated American Indian Tribes, including the Shivwits Band of the Paiute Indian Tribe of Utah, the Paiute Indian Tribe of Utah, the Kaibab Paiute Tribe, the Hopi Tribe, and the Navajo Nation. As required by 36CFR 800.3 (f), interested parties were identified and nine parties were invited to participate as formal consulting parties in the Section 106 process. Three of the invited parties (Southern Utah Wilderness Alliance, The LDS Church, and the Utah Rock Art Research Association) agreed to participate. Consulting parties met on April 26, 2017 to discuss the area of potential effects (APE) for the TMP and the BLM's efforts to identify historic properties (i.e., archeological sites listed to or eligible for listing to the National Register of Historic Places) within the APE. Identification efforts will include intensive pedestrian Class III-level cultural resource inventories within the APE.

## **Key National Environmental Policy Act Actions and/or Project Authorizations**

Completion of the ROD/Approved RMP was the key NEPA action for the NCA during this fiscal year.



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# 3 Year's Projects and Accomplishments

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## General Accomplishments

### Fire-Damaged Habitat Restoration Research

Since 2015, the Utah Partners for Conservation and Development have benefited from Utah Watershed Restoration Initiative funding to support a multi-year experimental habitat restoration research program in fire-damaged Mojave desert tortoise (*Gopherus agassizii*) critical habitat. Project sites are located in both the Red Cliffs and Beaver Dam Wash NCAs, based on a joint proposal submitted by the Utah Division of Wildlife Resources (UDWR) and the BLM. This research has also received funding from multiple sources, including the U.S. Fish and Wildlife Service (USFWS), The Nature Conservancy, the National Fish and Wildlife Service Foundation, and Washington County, bringing the total contributed to this research to over \$100,000.

As re-seeding has proven to be generally unsuccessful as a restoration method in the arid Mojave Desert, this program will research the effectiveness of out-planting mature, nursery grown containerized native species on a large scale, with the goal of re-establishing shrubs, forbs, and grasses that are beneficial to desert tortoise and other wildlife. The Department of Restoration Ecology at the University of Nevada, Las Vegas (UNLV) propagated 5,000 mature containerized plants from locally sourced seeds for habitat restoration in the NCA.

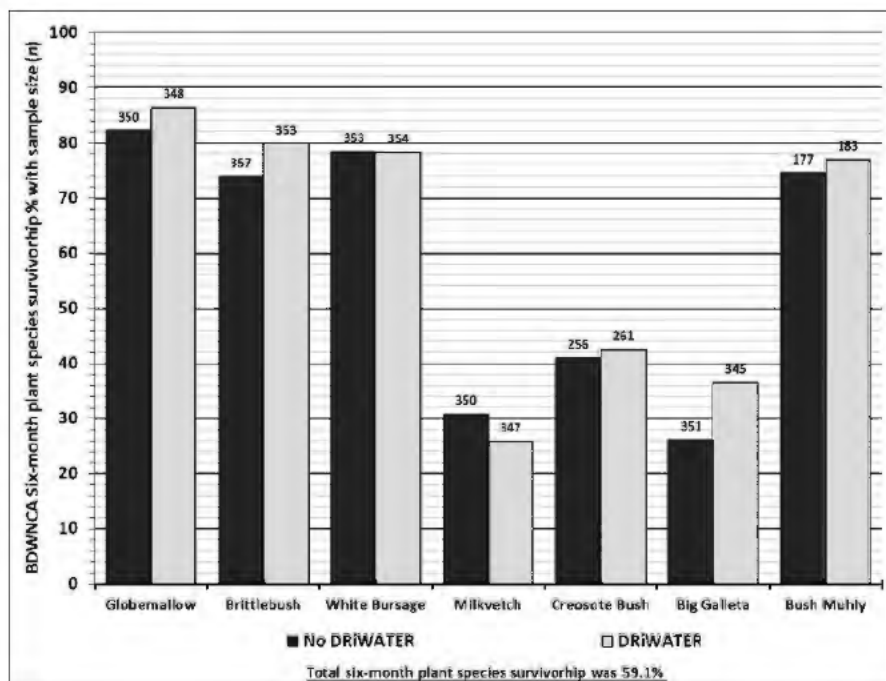
Biologists and botanists from the BLM, UDWR, USFWS, and UNLV selected a 100-acre fire-damaged site in the NCA, as the first habitat restoration research site. It is located within the 1,063-acre Woodbury Desert Study Area, an area within the NCA that is fenced and managed as unavailable for domestic livestock grazing. A GPS-based grid was established on the 100-acre site and approximately 350 smaller research plots were established within that grid. Data were collected on native vegetation community composition, noxious weeds, and exotic invasive species present in the research site.



In November of 2016, 4,743 one-gallon size containerized plants were hand planted in the research site by American Conservation Experience (ACE) crews and volunteers. They included seven native species: creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), big galleta (*Pleuraphis rigida*), desert globemallow (*Sphaeralcea ambigua*), bush muhly (*Muhlenbergia spp.*) and Astragalus (*Astragalus spp.*). Thirteen plants were placed in each of the 351 plots, with two plants of each species, except bush muhly, being planted in each plot. Protective chicken wire cages were placed around all but the creosote bush plants, to protect them from small mammal herbivory. An artificial water gel (shown in photo at left) was provided to all plants in alternate

research plots, to evaluate whether its use increases their survival rate. The 354 remaining plants were planted along ephemeral drainages in the research site. All plants were hand watered during the spring and summer months, whenever soil probes indicated that soil moisture at 10" depth had dropped below 12%.

The NCA Biologist completed plant survivorship counts in May 2017. Of the total number of plants planted within the research plots ( $n = 4,385$ ), 2,593 (59.1%) had survived (see graph below). Based on survivorship at six months, it appears that including an artificial water gel does benefit most plant species, but future survivorship data will determine whether the benefits outweigh the costs.



## Rangeland Health Monitoring

The Beaver Dam Slope, Castle Cliff, and Scarecrow Peak Allotments are partially or entirely located within the boundaries of the NCA. A fourth allotment, the Cedar Pockets Allotment contains a pasture within the NCA, but a majority of the allotment is located in Arizona and administered by the BLM Arizona Field Office. The four allotments are permitted for cattle grazing, under a pasture rotation system, with a fall-winter season of use. During FY17, the SGFO Rangeland Management Specialists completed all scheduled utilization and trend monitoring for Beaver Dam Slope and Castle Cliff Allotments and utilization monitoring only for the Scarecrow Peak Allotment, as no trend monitoring was scheduled. The BLM Arizona Field Office staff completed only utilization monitoring for the Cedar Pockets pasture in the NCA, as trend monitoring was not scheduled.

Utilization monitoring is defined as “the portion or degree, expressed in a percent, of the current year’s growth, that is consumed or destroyed by foraging animals”. Monitoring of utilization on key forage species in all allotments was conducted at multiple sites that were selected based on topography, observed changes in vegetation communities, and distance from water sources. Under the Allotment

Management Plans for the three allotments managed by the SGFO, utilization on key species cannot exceed 60% of current year's growth.

Data collected in the Beaver Dam Slope Pasture of the Beaver Dam Slope Allotment documented 20% utilization on key species. In the Desert Pasture of the Castle Cliff Allotment, utilization was 9% on key forage species, while the Bulldog Pasture of this same allotment showed 21% utilization on key species. The Terry Bench Pasture of the Scarecrow Peak Allotment, located partially within the NCA, showed 15% utilization on key species. Clearly, utilization in these three allotments will well below that authorized through the Allotment Management Plans.

Vegetation trend plots were monitored for the same pastures in the Beaver Dam Slope and Castle Cliff Allotments during this fiscal year. No apparent trend for key species was detected for key species in either allotment. No trend monitoring was scheduled for the Scarecrow Peak Allotment.

Precipitation data continued to be collected from rain gauges at two locations within the NCA. Similar data have been collected at these locations for more than 30 years, allowing for comparisons between past and current precipitation regimes. A new solar powered digital "Hobo" weather station was installed in the Woodbury Desert Study Area of the NCA and provides "real time" detailed information on local climatic conditions, including temperature, wind speed, precipitation, and soil moisture levels at three depths.

Noxious weed inventories were conducted by the Rangeland Management Specialists during rangeland health monitoring and infestations in the NCA, including species and location, encoded in the NISMS database. Small-scale infestations of noxious weeds were eradicated, using hand tools, wherever they were encountered.

As part of the overall rangeland health assessments with the BLM, biologists from UDWR completed population studies and habitat monitoring for desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), Gambel's quail (*Calipepla gambelii*) and mourning doves (*Zenaida macroura*) within the boundaries of the NCA. The NCA includes approximately 8,600 acres of year-long crucial habitat for desert bighorn sheep, and 2,700 acres of crucial winter range and 115 acres of crucial summer fawning habitat for mule deer. Nearly 95% of the NCA is crucial year-round habitat for quail and dove, both popular upland game birds for hunters. Based on data

collected in FY17, UDWR has concluded that desert bighorn sheep and mule deer populations are increasing, while upland game bird populations remain static.

### **Recreation Management**

The NCA Outdoor Recreation Planners and Park Rangers monitored visitor numbers and uses within the NCA, through visitor contacts and digital traffic counters placed at entry points to popular recreational use locations, such as the technical climbing areas in the Beaver Dam Mountains, and on routes where dispersed auto camping and ATV/UTV riding are popular. The estimated number of visits in FY17 was 9,500, while the number of visitor days totaled 21,000.

Twenty-nine Special Recreation Permits (SRP) currently authorize commercial activities in the NCA, with a majority of the permits being for guided big game hunting for desert bighorn sheep and mule deer. Other SRPs authorize guided rock climbing and wilderness therapy programs for troubled youth. The photo above shows a guided rock climb, authorized under one of the commercial SRPs.

### **Current Area of Focus**

Having just completed a new RMP for the Beaver Dam Wash NCA, the NCA Manager and staff are now beginning to implement decisions from that plan. The installation of new two and four-sided kiosks is currently underway to display maps, regulatory and safety information, and interpretative panels along primary roads that cross the NCA. An Interpretive Concept Design Plan was contracted in FY17 and will help to identify the important themes for the NCA and guide the content, media, and location for interpretation of those themes. During this fiscal year, we also began marking the authorized dispersed camping sites along routes in the NCA, installing fiberglass posts with information decals and metal fire rings at those locations.



## Education, Outreach, and Interpretation

### Environmental Education

The NCA Biologist provided in-the-field environmental education outreach for youth attending the Red Rock Canyon School, a psychiatric residential treatment center for 12 to 18 year old teens. After learning about Mojave Desert ecology and desert tortoise, students assisted with belt transect surveys for live tortoise, burrows, and scat in the Woodbury Desert Study Area of the NCA. Students, as shown in the photo at left, also helped to plant and cage containerized native plants in November of 2016.



### Interpretation



In FY17, the BLM contracted with Sea Reach, a firm with over 30 years of experience writing interpretive plans, to prepare an Interpretive Concept Design Plan for the NCA. Sea Reach personnel joined the NCA Manager and staff for a tour of the NCA in July and will facilitate workshops with

NCA staff, various stakeholders, and partner groups in October 2017 to identify themes that should be interpreted for the NCA.

The NCA Landscape Architect developed two new interpretive panels, shown below, for placement in a kiosk in the Woodbury Desert Study Area, adjacent to the 100 acre habitat restoration site. The left panel describes research studies conducted on

Mojave desert tortoise in the Study Area during the 1930s by Angus Woodbury. The second panel describes the ongoing tortoise habitat restoration research program.

## Partnerships

### Southern Utah National Conservation Lands Friends (SUNCLF)

The Southern Utah National Conservation Lands Friends (SUNCLF), a 501 (c) (3) non-profit “friends” group, continues to support the BLM’s management of the Beaver Dam Wash NCA, through a Cooperative Assistance Agreement. SUNCLF assists BLM with volunteer stewardship programs, environmental education outreach, and special projects. In FY17, SUNCLF provided information about the NCA at local events, such as “Take it Outdoors Day” and “Junior Ranger Day” and helped to recruit volunteers to assist with the habitat restoration project in the Woodbury Desert Study Area.



### Dixie-Arizona Strip Interpretive Association (DASIA)

Outreach for the NCA is also provided by Dixie-Arizona Strip Interpretive Association (DASIA), also a 501 (c) (3) not-for-profit group, through a Cooperative Assistance Agreement with BLM. DASIA recruits volunteers who assist with public contacts and visitor services in the interagency Public Lands Information Center in St. George, UT and with special projects. Speakers are scheduled by DASIA for the very popular weekly Friday Brown Bag Lecture Series, held in Public Lands Information Center.



### Song Dog Native Plant Nursery, Lake Mead National Recreation Area

In FY17, a new Inter-Agency Agreement was established with the National Park Service’s (NPS) Lake Mead National Recreation Area, headquartered in Boulder City, Nevada, to grow containerized native plants for habitat restoration projects in the NCA and provide technical assistance to restoration project planning. The NPS Song Dog Native Plant Nursery staff have many years of experience propagating Mojave Desert

species and large-scale facilities in which to grow mature plants.

## Volunteers

Volunteers donated more than 500 hours of time to assist with habitat restoration and resource monitoring in FY17. As examples:



Thirty volunteers, shown at left, recruited by The Nature Conservancy and SUNCLF donated more than 320 hours of volunteer time, making wire cages to protect the 4,743 native plants that were planted in the Woodbury Desert Study Area to restore fire-damaged tortoise habitat.

Volunteer trail stewards from the Old Spanish Trail Association donated 80 hours of time conducting field inventories to identify whether high potential segments of the Armijo Route of the Old Spanish National Historic Trail were present in Bull Dog Canyon, in the NCA.

## Land (or Interests in Land) Acquisitions

No lands or interests in lands were acquired during this fiscal year.

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# 4 Science

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## Science Plan

A Science Plan has not yet been formalized for the Beaver Dam Wash NCA. However, some of the opportunities for research that would inform the long-term management of the NCA were identified in the ROD and Approved RMP. These opportunities will be included in the comprehensive Science Plan that will be developed in the future. Scientific research that is ongoing at this time in the NCA includes the following:

### **Tortoise Population Spatial Distribution and Relative Abundance Study**

In FY17, the NCA Biologist, assisted by two Biological Resource Associates from the American Conservation Experience (ACE), began a new tortoise study in the 1,063 acre Woodbury Desert Study Area of the NCA. The goals of this population study are to determine: (1) the spatial distribution of live tortoises and their sign; (2) the relative abundance of tortoises; (3) the location of key habitat features including tortoise burrows and shelters; and (4) current tortoise habitat use and habitat use changes over time, in relation to habitat restoration areas.

The field methodology involves biologists walking parallel north-south oriented belt transects, spaced at 10 meter intervals, collecting geo-spatial data on observed tortoises, burrows, scat or other evidence of tortoise use, as well as documenting native and exotic vegetation and other wildlife observed in the Study Area. Digital photographs and videos of the tortoise observations will supplement the documentation. This first year's efforts covered approximately 684 acres, including the 100-acre habitat restoration site, and documented 11 live tortoises of diverse age classes, 2 tortoise carcasses, 206 burrows, and 100 specimens of scat.

The first studies of the Mojave desert tortoise were conducted in the Woodbury Desert Study Area during the 1930s and continued for decades in this same area. However, these studies were discontinued in 2002. New baseline data from the current study, however, can be compared to the data collected by past researchers. Observed changes in tortoise distributions and relative abundances could be useful indicators of the species' responses to land uses, such as livestock grazing and recreational activities, or to natural phenomena, including wildfires, invasive species, and changing



climatic conditions. This research could help to focus habitat protection and restoration projects, refine proposals for future population augmentations, and develop additional field studies needed to correlate habitat parameters with tortoise density and distributions. The four photos below, taken during this year's fieldwork, show a desert tortoise, a tortoise burrow, tortoise scat, and two male tortoises fighting over a winter burrow in the Study Area.



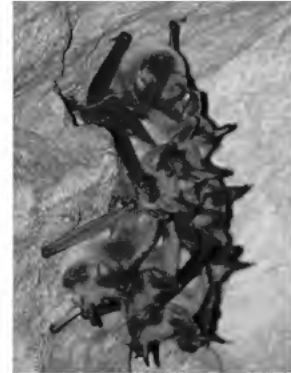
### **USFWS Range-wide Annual Monitoring Studies for Mojave Desert Tortoise**

In June of 2017, biological field teams from the USFWS Tortoise Recovery Program conducted annual desert tortoise monitoring, using line distance sampling methods to detect tortoises and sign within approximately 905 acres of the NCA. This monitoring was part of annual studies conducted in the Beaver Dam Slope Subunit of the large Northeastern Mojave Recovery Unit, which includes lands in southwestern Washington County in Utah, southern Nevada, and northeastern Arizona. The objectives of the USFWS range-wide monitoring program are to estimate trends in adult tortoise populations across each recovery unit over at least a 25-year monitoring period and document any detected changes in tortoise distribution within recovery units. Tortoise number and density estimates appear to have steadily increased for the Beaver Dam Slope Subunit, since monitoring studies began in 2001. The apparent increases may be due to improved training of the field crews who are doing the data collection or may represent actual increases in tortoise populations.



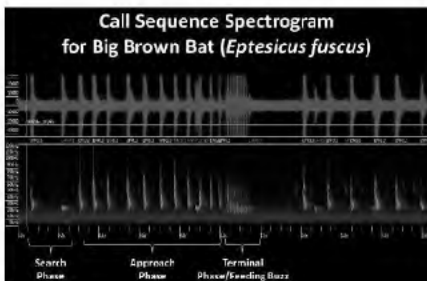
## Acoustical Bat Monitoring Studies

Data on bat distribution, numbers, trends, and ecology are currently very limited for Washington County, Utah, where habitat for bats and other wildlife is rapidly being lost to development. Eighteen species of bats have been identified in Utah, but data on which of those species occur in Washington County is incomplete. In 2015, the BLM initiated monitoring studies in the NCA and elsewhere on public lands in the County, to collect data on bat species and distributions, using permanent and mobile acoustical devices.



Permanent ultrasonic bat recorders are positioned for one year at various locations in the NCA. In FY17, the NCA Biologist, assisted by two Biological Resource Associates from ACE, also recorded bat calls at 10 locations in the NCA, using handheld ultrasonic bat recorders with species identification software, hosted on iPads. The software provides real time species identification of the recorded bat call. The figure below shows a spectrogram of the call of the Big Brown Bat (*Eptesicus fuscus*). Data on bat species identified, location, date, ecological setting, and

meteorological conditions collected by the permanent and mobile recorders are stored in a geodatabase in GIS. Using these data, models can be created for species-habitat distribution and diversity.



Acoustical monitoring studies have verified that 16 or the 18 bat species in Utah are found in the NCA, including a number of BLM Sensitive Species. Additionally, the data collected have expanded the known range of several bat species into the NCA and other areas of Washington County. Information from this ongoing study will enable the BLM to more

effectively conserve, protect, and restore important bat habitats within the NCA and mitigate impacts to these habitats outside of the NCA boundaries.

### Utah State University: XRF Fracture Scanline Survey

In February of 2017, students from the University State University's Geology Department, under the direction of Dr. Kelly Bradbury, used a portable Brucker X-ray Fluorescence Unit (XRF) to analyze the chemical elements of various rock units exposed along a fault in the Beaver Dam Mountains of the NCA. As part of a geology class field trip, students learned to use the XRF unit to "finger print" the chemistry of the rock units exposed along the fault and collected 10 small samples for testing in the lab.

### Dixie State University: Pollinator Studies in the Blackbrush-Joshua Tree Community

During the spring of 2017, students from Dixie State University, under the direction of Dr. Erin O'Brien, Associate Professor of Biology, conducted pollinator studies at four locations: two within the wildfire-damaged Joshua Tree National Natural Landmark, two in unburned areas of the NCA in the blackbrush-Joshua tree community.



The students walked 10 transects, each measuring one meter wide by 1,000 meters long, at each site, estimating exotic annual grass coverage through a meter quadrant plot, documenting Joshua trees in bloom, and surveying for yucca moths (*Tegeticula antithetica*-shown in photo) and other pollinators. During an evening survey at each site, pollinators were identified and counted, using a backlight against a white sheet. This study was funded by the National Park Service's National Natural Landmark Program and a report documenting these findings will be provided to the NPS and the BLM in 2018.

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# 5 Resources, Objects, Values, and Stressors

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The Congressionally-defined purposes for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at sec. 1975, are:

*To conserve, protect and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the Beaver Dam Wash National Conservation Area.*

The BLM has identified a number of natural and cultural resources within the NCA that are unique and scientifically important, including the following:

- Ecological diversity created by the convergence of the Mojave Desert and Great Basin ecoregions;
- Iconic Mojave Desert vegetation communities and Joshua Tree National Natural Landmark;
- Habitats critical for at-risk native species, including the Mojave desert tortoise; Gila monster; Southwestern willow flycatcher; and many species of bats, reptiles, raptors, and migratory birds;
- Archaeological sites that preserve evidence of Archaic, Ancestral Puebloan, and Southern Paiute occupations and land uses;
- The Northern and potential Armijo Routes of the Old Spanish National Historic Trail, the early 19th century pack trail followed by traders, explorers, and settlers as they crossed the arid lands of the Mojave Desert. This trail was recognized by Congress through designation as a National Historic Trail in 2002;
- Historic period Euro-American heritage resources, including 19th century wagon roads and telegraph lines, historic mines, the early 20th century Arrowhead Trails Highway, and features constructed by the Civilian Conservation Corps during the Great Depression of the 1930s.
- Geologic resources, such as the 1.7 billion year-old Precambrian strata of the Beaver Dam Mountains, the oldest exposed rocks in southwest Utah;
- Caves and karsts with unique geological, biological, cultural or recreational values;

The NCA resources are significant from a regional and national perspective because they afford:

- Opportunities for scientific studies of geologic processes and paleo-environments of the earliest periods of Earth's history, through the exposed geologic units of the Beaver Dam Mountains;
- Opportunities for habitat restoration and population translocations in critical habitats for the threatened Mojave desert tortoise and other at-risk species of the Beaver Dam Slope;
- Opportunities for re-introductions of native aquatic and riparian species at Welcome Spring and in the Beaver Dam Wash;
- Opportunities for habitat restoration and protection of crucial seasonal ranges and migration corridors for mule deer and desert bighorn sheep;
- Opportunities to continue Mojave Desert plant and animal studies in the Woodbury Desert Study Area;
- Opportunities for solitude, natural quiet, dark night skies, and primitive, unconfined recreation within a large area of remote and substantially undisturbed public lands;
- Opportunities for the public use, interpretation, and high quality vicarious visitor experiences along the Northern and potential Armijo Routes of the Old Spanish National Historic Trail;
- Opportunities for conservation, protection, restoration, scientific study, public use, and interpretation of an array of prehistoric and historic period archaeological sites that document the broad span of human history in southwestern Utah;
- Opportunities for sustainable outdoor recreation and resource interpretation on public lands that enhance the quality of life for local residents and visitors and help to sustain the economic health of local communities;
- Opportunities for broad-based scientific, academic, and community partnerships, volunteer programs, youth and veteran training and employment initiatives, developed to enhance public appreciation and citizen stewardship of the NCA resources and values

As benchmarks have not been established through a Science Plan, the following assessment focuses on those resources for which status and trend are currently being monitored in the NCA.

# Ecological Resources

## Native Upland Vegetation Communities

The NCA is within a transition zone between the Mojave Desert and the Great Basin eco-regions and includes vegetation communities from the two eco-regions. These communities include Mojave Desert shrubs, like creosote bush, white bursage, and blackbrush, and various species of cacti, yucca, and Utah agave. The iconic Joshua tree co-occurs with blackbrush and scattered Utah juniper trees. Basin Big sagebrush and mountain mahogany, species that are typically associated with the Great Basin eco-region, grow at higher elevations in the NCA.

The ecological health of the upland vegetation communities was assessed in 2011, through a Landscape Conservation Forecasting Process conducted in partnership with The Nature Conservancy. The assessments of status and trend provided below are based on the Natural Range of Variability (NRV) used in that process. Monitoring is conducted in each community, with the acreages completed in FY17 shown in the table below.

Status of Native Upland Vegetation		Trend	
Fair to Good		Stable	
Inventory, Assessment, Monitoring of Native Upland Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	Creosote:22,041 Blackbrush:37,281 Pinyon-juniper:270 Mountain shrub:143 Big Sagebrush:14	Creosote:22,041 Blackbrush:37,281 Pinyon-juniper:270 Mountain shrub:143 Big Sagebrush:14	Creosote: 15,000 Blackbrush: 35,000 Pinyon-juniper: 0 Mountain shrub-0 Big Sagebrush-0



## Riparian Vegetation

Warm desert riparian and riparian wash vegetation was mapped and the ecological health of these communities evaluated along the Beaver Dam Wash, Welcome Creek, and many ephemeral drainages in 2011, during the Landscape Conservation Forecasting Process, conducted in partnership with The Nature Conservancy. Woody species that typify both riparian communities include mesquite, native willows, and Fremont's cottonwood.

Status of Riparian Vegetation Status		Trend	
Good		Stable	
Inventory, Assessment, Monitoring of Riparian Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	Warm Desert Riparian:114	Warm Desert Riparian:114	Warm Desert Riparian: 114
	Warm Desert Riparian Wash: 3,345	Warm Desert Riparian Wash: 3,345	Warm Desert Riparian Wash: 2,500

## Stressors Affecting Ecological Resources



Wild fires, exotic invasive annual grasses, and predicted changes in precipitation regimes that will benefit invasive species are the primary stressors affecting all upland vegetation communities. Mature blackbrush-Joshua tree shrub lands, in particular, have been most severely impacted. Over the past 20 years, wild fires, fueled by exotic annual brome grasses, have burned or re-burned 80% of this community; many re-burn areas have been converted to exotic brome grasslands that prevent the re-establishment of native species. As Mojave Desert vegetation is slow to recover, even under optimum conditions, it will be centuries before mature blackbrush

and Joshua tree communities are again present in the fire-damaged areas of the NCA.

Riparian vegetation along Beaver Dam Wash, Welcome Creek, and ephemeral drainages are impacted by episodic flooding; livestock grazing; unauthorized motorized vehicle travel; and exotic species infestations. Cattle in the Beaver Dam Slope and Jackson Wash Allotments have access to the riparian zones and create vegetation impacts and soil disturbances that accelerate stream bank erosion and temporarily impair surface water quality. Exotic salt cedar (*Tamarack* spp.) in the riparian areas and ephemeral drainages competes with native species and reduces available surface water. Exclosure fencing around the Welcome Springs complex has helped to protect the riparian vegetation at the spring sources and along a portion of Welcome Creek from livestock grazing and motorized vehicle-related damage. Native willows and other riparian species are recovering and increasing in areal extent within the exclosure.

## Wildlife: Threatened and Endangered Species

Because the NCA lies within a transition zone between the Mojave Desert and the Great Basin, it provides a mosaic of habitats for diverse wildlife species, some at the extremes of their historic ranges. Such species tend to have less stable populations than those closer to the center of their range. The threatened Mojave desert tortoise occurs in the NCA and data are collected annually on population trends and habitat conditions by the BLM and the USFWS.

Two avian species, the Southwestern willow flycatcher (*Empidonax traillii extimis*) and Western yellow-billed cuckoo (*Coccyzus americanuss occidentalis*), are listed under the protection of the Endangered Species Act and have the potential to occur in the NCA.

## Mojave Desert Tortoise



The desert tortoise is a long-lived “indicator species” that is useful for evaluating the health of the Mojave Desert ecosystem. Over millions of years of evolution, the species has successfully adapted to changing environmental conditions and has been able to flourish, even in the harsh environment of the Mojave Desert.

Status of Tortoise Critical Habitat		Trend
Fair		Stable in unburned areas Declining in fire-impacted areas
Status of Tortoise Populations		Trend
Fair		Stable to slightly increasing on Beaver Dam Slope of Utah, AZ, and Nevada
Inventory, Assessment, Monitoring Table of Tortoise Critical Habitat		
Acres in Unit	Acres of Critical Habitat	Acres Monitored in FY17
63,480	50,900	1,589 acres

## Stressors Affecting Mojave Desert Tortoise

Wild fires, exotic invasive annuals, and predicted changes in precipitation regimes that will benefit exotic invasive species are the primary stressors affecting the critical habitat of the Mojave desert tortoise. The creosote-bursage community comprises a majority of that critical habitat and has not been impacted by recent wild fires. However, this community remains at high risk of wild fires because invasive brome grasses are present throughout this community. Approximately 80% of the blackbrush-Joshua tree shrublands in the NCA have been damaged by recent fires and will not recover for many years. Some areas impacted by multiple fires have been

converted to invasive brome grasslands which provide limited forage value or shade cover for tortoises. When tortoises, particularly juveniles, consume brome grasses and other exotic species, they suffer nutritional deficiencies that impair their growth and reproductive success. Exotic invasive grassland provide inadequate shade cover for tortoises, increasing for mortalities due to exposure to summer heat and predation.

### **Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Both of these birds are currently listed under the ESA and are riparian obligates that depend on healthy riparian areas with dense stands of willows and cottonwood trees for nesting and foraging. Suitable habitat for these species is present along Beaver Dam Wash. There are no known nesting locations for either species in the NCA and only a single confirmed sighting of a Southwestern willow-flycatcher.

Status of Riparian Habitat for T&E Birds		Trend	
Good		Stable	
Status of Flycatcher and Cuckoo Bird Populations		Trend in NCA	
Declining across ranges		Unknown	
Inventory, Assessment, Monitoring Table of Riparian Habitat for T&E Birds			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	114	114

### **Stressors Affecting Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo**

Habitat loss to developments and infestations by exotic invasive species that degrade riparian areas, such as giant reed (*Arundo donax*) and tamarisk (*Tamarack spp.*), are the principal stressors on these species. Prolonged droughts and predicted changes in

the timing and amounts of annual precipitation could also impact the survival of willows and cottonwood trees that provide critical nesting and foraging habitat for flycatchers and cuckoos.

## Recreation Resources

The public can engage in diverse outdoor recreation opportunities in the NCA during all but the hottest months of summer. The NCA currently has no developed recreation trails or other facilities and current uses are primarily casual and dispersed in nature: car-camping, technical rock climbing, upland big game and game bird hunting, nature photography, and ATV/UTV riding on the network of unpaved roads that cross some areas of the NCA. Many of the SRP holders who operate in the NCA offer commercial guided big game hunts, rock climbs, and motorized vehicle (ATV, 4x4) tours.

In 2017, the estimated number of visits was 9,500, the estimated number of visitor days exceeded 21,000. Both reflect increasing recreational use of the NCA, as it is within easy driving distance of the major metropolitan area of Las Vegas, Nevada and the rapidly growing cities of Mesquite, Nevada, and St. George, Utah. The NCA has the potential to be a recreation destination, as visitor services are developed and information about the recreation opportunities of the area more widely disseminated.

The new NCA RMP contains implementation level decisions that call for the preparation of activity level management plans that will identify specific management actions to enhance sustainable outdoor recreation opportunities. These include a Recreation Area Management Plan (RAMP) for the Beaver Dam Wash Special Recreation Management Area (SRMA), established through the RMP. The RAMP will include the development and management of non-motorized and motorized trail systems, rock climbing, dispersed camping and developed camping sites.

Status of Recreation Resources	Trend
Good	Stable



Inventory, Assessment, Monitoring of Recreation Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	63,480	2,000

### Stressors Affecting Recreation Resources

Recreational resources and opportunities may be affected by any of the stressors that impact other values, as visitors to the NCA typically expect to enjoy unspoiled scenic vistas, wildlife viewing, and natural quiet. Unmanaged recreational uses can not only impact natural and cultural resources but can also impair the quality of visitor experiences.

## Scenic Resources

The rugged and relatively undeveloped character of the NCA landscape contributes to its scenic values. Mojave Desert vegetation, including white bursage, creosote, and several species of cholla, yucca, and barrel cactus gradually transition to stands of blackbrush and Joshua trees on the rolling hills that comprise the lower slopes of the Beaver Dam Mountains. For a brief period every spring, the desert comes alive with vibrant colors, as the desert vegetation enjoys a brief annual bloom. Large washes cut through the landscape, all flowing towards the Beaver Dam Wash, a dominant topographic feature of the landscape. A Visual Resource Inventory (VRI) completed by the BLM for the NCA, has rated its scenic qualities according the four classes used by BLM's Visual Resource Management System.

The naturalness of the landscape also contributes to its scenic qualities and can determined through inventories and evaluations for the presence or absence of wilderness characteristics. These characteristics include size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined recreation. The results of the inventories and evaluations indicated that 69% of the public lands in the NCA possess wilderness characteristics.

Status of Scenic Resources			Trend
Good			Stable
Inventory, Assessment, Monitoring of Scenic Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	VRM Class I-0 VRM Class II-7,586 VRM Class III-43,753 VRM Class IV-12,138	63,480

### Naturalness

Status of Lands with Wilderness Characteristics			Trend
Good			Stable
Inventory, Assessment, and Monitoring of Lands with Wilderness Characteristics			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY17
63,480	63,480	43,870	500

### Stressors Affecting Scenic Resources

Wild fires, exotic invasive annuals, and predicted drought that benefit invasive species are the primary stressors that directly affect the scenic qualities of the NCA. In 2005-2006, catastrophic fires burned or re-burned nearly 50% of the eastern and northern portions of the NCA. As Mojave Desert shrubs are not fire-adapted species, the fire scars will remain visible for decades. In the southern and western portions of the NCA,

the native vegetation communities and the scenic values remain undamaged by fire. Increasing recreational uses, particularly if not properly managed, would also have the potential to impact its natural qualities, if these uses damage resource values and degrade the quality of visitor experiences.

## Cultural and Historical Resources

Many cultural groups have used and occupied the land base of the NCA over the broad expanse of human history. Evidence of this use is preserved in prehistoric and historic period archeological sites and as Traditional Cultural Properties, Native American Sacred Sites, and cultural landscapes. The material culture of ancient Native American cultures, including Archaic, Ancestral Puebloans and Numic-speaking Southern Paiute groups, is found in campsites, rock shelters, and occupation sites. Anglo-European explorers in the 18<sup>th</sup> and 19<sup>th</sup> centuries reported that Southern Paiute groups were cultivating small corn and bean fields in the Beaver Dam Wash. As only a very small percentage of the NCA has been inventoried to identify these cultural resources, many more undocumented sites of significant scientific value will be identified in the future.

The NCA landscape was crossed by the first Anglo-Europeans in this region. In 1826, American fur trapper and explorer Jedediah Smith traveled through Washington County to the Beaver Dam Wash, following its channel south to the Virgin River. By 1829, a long distance pack trail system had been pioneered by New Mexicans to the Spanish missions in California and it crossed the NCA, following the current alignment of Old [U.S.]. Highway 91. From 1829 until about 1850, mule pack train used this trail, labeled by John C. Fremont, who also traveled through the area, as the "Old Spanish Trail". Today, the Old Spanish Trail is a Congressionally- designated National Historic Trail, with the Northern Route and the potential Armijo Route crossing the NCA.

In FY17, volunteers from the Old Spanish Trail Association conducted a field reconnaissance along the potential Armijo Route through the NCA. They examined approximately 5 miles of Bull Dog Canyon within the NCA, looking for any trail traces or artifacts that could be associated with

use of the Old Spanish National Historic Trail during its 19<sup>th</sup> century period of significance.

The new NCA RMP (2016) established a Trail Management Corridor (12, 506 acres in size) for the Old Spanish National Historic Trail that encompasses both the legislatively-depicted Northern Route and the potential Armijo Route. Within that corridor, the setting of the National Historic Trail will be protected by management as an Exclusion Area to new ROWs and under VRM Class II standards. Fire-damaged landscapes within the corridor will be restored with native species, to the extent possible. Wayside exhibits or panels at Welcome or Orientation pullouts will include interpretation of the OSNHT.

### **Cultural Resource Inventories**

Approximately 25 acres along Washington County's Old Highway 91 ROW were inventoried at Class III level by an archeological services contractor, prior to proposed maintenance work by Washington County. This inventory resulted in documentation of two new archaeological sites and updated recordings of six previously-documented sites within and immediately adjacent to the highway ROW. These sites included segments of three historic roadways, Old Highway 91, the Arrowhead Trails Highway, and the Old Mormon Trail, as well as two abandoned early 20<sup>th</sup> century service stations associated with Old Highway 91 and the Arrowhead Trails Highway.

The NCA Archeologist completed 10 acres of Class III inventory in the Woodbury Desert Study Area where another habitat restoration out-planting is planned in FY18. There were no archeological materials or sites identified by that inventory.

Approximately 80 acres were inventoried by NCA staff in the Beaver Dam Mountains along the boundaries of the NCA, to identify undocumented caves and rock shelters that contained cultural resource materials and deposits. This inventory documented one large rock shelter, called "Hidden Midden Cave", and its associated artifacts and cultural deposits. The geologic formations, artifacts, and cultural deposits of this shelter were mapped and an site record completed. Two samples of organic materials were collected and dated using AMS/C14, producing occupancy dates between 820 BP (years Before Present) and 200 BP.

### **Site Monitoring**

During FY17, NCA staff monitored 15 archeological sites, including prehistoric period shelters containing cultural materials and historic period routes, service stations, and two abandoned historic mines, the West Jessy and Jose Cuervo mines, both dating to the late 19<sup>th</sup> century.

Status of Cultural and Historical Values			Trend
Good			Stable
Inventory, Assessment, Monitoring of Cultural and Historical Resources			
Total Acres of Unit	Acres Previously Inventoried	Acres Inventoried in FY17	Sites Monitored in FY17
63,480	4,620	115	15

### Stressors Affecting Cultural and Historical Resources

Stressors on cultural and historical resources include human-caused impacts and surface disturbances related to recreational uses, as well as vandalism and site looting. Wildfires can destroy historic wooden structures or features, and damage rock art bearing geological surfaces. Loss of vegetative cover can accelerate soil erosion that also damages site integrity.



## Natural Resources



### Geological, Paleontological, Cave and Karst Values

In the Beaver Dam Mountains of the NCA are exposed 1.7 billion year old Paleozoic rock units that are of scientific interest in the study of Earth's geologic history, as these are the oldest exposed rocks in southwestern Utah. Other formations contain invertebrate fossils that provide

evidence of changing environmental conditions over time, as plate tectonics, continental expansion, and volcanism influenced Earth's biological history. Some formations in the Beaver Dam Mountains of the NCA are conducive to the formation of caves and karst features, like "Icicle Cave shown in the photo above. Some of these caves contain unique biota or preserve cultural resources.

Status of Geological, Paleontological, and Cave and Karst Values	Trend
Good	Stable

Inventory, Assessment, Monitoring of Paleontological Resources			
Total Acres of Unit	Acres Inventoried through Potential Fossil Yield Evaluations	Localities Recorded in FY17	Localities Monitored in FY17
63,480	63,480	0	2

In FY17, the NCA Outdoor Recreation Planner documented 15 new rock shelters in the NCA. Five previously documented caves and shelters were monitored to identify any visitor-related impacts on their geological structures and/or cultural resource materials and deposits.

Inventory, Assessment, Monitoring of Cave and Karst Resources				
Total Acres of Unit	Acres Previously Inventoried	Acres Inventoried in FY17	New Caves Recorded in FY17	Caves Monitored in FY17
63,480	600	80	15	5

# 6 Summary of Performance Measures

The Congressionally-defined purpose for designation of the NCA, as stated in P.L.111-11 at Title I, Subtitle O at section 1975 are:

*(1)To conserve, protect and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area.*

The following summarizes status and trend for those resources and values identified by Congress for conservation, protection, and enhancement.

Summary Table*		
Resource, Object, or Value	Status	Trend
Ecological-Native Vegetation Communities	Fair to Good	Variable by Veg. Community
Scenic	Good	Stable
Wildlife-T&E Species	Fair	Variable by Species
Recreation Resources	Good	Stable
Cultural/Historical	Good	Stable
Natural-Geological	Good	Stable
Natural-Lands with Wilderness Characteristics	Good	Stable
Educational	Good	Stable
Scientific	Good	Stable

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## 7 Manager's Letter

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Dear Friends of the Beaver Dam Wash NCA:


The Manager's Annual Report highlights just a few of the projects that we completed this year in the Beaver Dam Wash NCA. Our efforts were furthered by contributions from many dedicated volunteers, community partners, researchers, and members of the public who support the conservation purposes of the NCA.

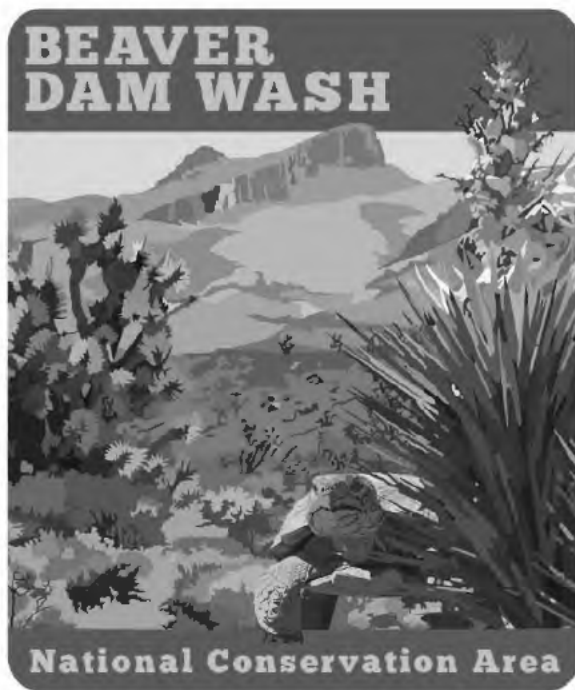
This year we were able to complete the Beaver Dam Wash NCA RMP and have the Record of Decision signed in December. We appreciate the input provided by the public, other Federal and State agencies, and the Cooperating Agencies that helped us to develop a plan that will conserve, protect, and restore the resource values of the NCA. We will now move forward to implement the management actions approved in the new RMP. During the upcoming year, our focus will also be on the following:

- Engaging the public and soliciting input from all affected parties on the Draft Comprehensive Travel and Transportation Management Plan for Washington County when it is released;
- Supporting the local and regional economy, through the granting of Special Recreation Permits for commercial recreational activities compatible with the purposes of the NCA;
- Improving the quality of visitor experiences, through Welcome and Orientation pullouts with kiosks, maps, safety information, and interpretation;
- Supporting scientific research that increases the understanding of the resources and values of the NCA;
- Providing environmental education outreach and engaging students of all ages in NCA projects and research studies; and
- Fostering new opportunities for volunteers of all ages to help us further the conservation purpose of the NCA.

We thank you for your interest in and support of the Beaver Dam Wash NCA.

Sincerely,





**Bureau of Land Management-Utah**  
**St. George Field Office**  
**Public Lands Information Center**  
**345 E. Riverside Drive**  
**St. George, UT 84790**  
**Phone: (435)-688-3200**



**NATIONAL  
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Please note that if you do not provide OS FOIA with the information requested on this form at this time, and an appeal challenging the sufficiency of the search is filed, you may then be required to reconstruct or duplicate your entire search efforts.

The attached request has been referred to your office to conduct a search for responsive records. Please return this certification and any responsive records.

**TOTAL SEARCH TIME EXPENDED**

Please indicate time to within ¼ hour

Clerical Search Time (GS-7 And Below) \_\_\_\_\_  
Professional Search Time (GS-8 Through GS-12) \_\_\_\_\_  
Managerial Search Time (GS-13 And Above) \_\_\_\_\_  
Any Other Costs (Identify) \_\_\_\_\_

**CERTIFICATION**

I CERTIFY BY SIGNATURE BELOW THAT AN ADEQUATE AND THOROUGH SEARCH HAS BEEN CONDUCTED FOR RECORDS/INFORMATION RESPONSIVE TO THIS REQUEST AND ALL RESPONSIVE MATERIAL HAS BEEN BROUGHT TO THE ATTENTION OF OS FOIA.

\_\_\_\_\_  
SIGNATURE (DATE)

\_\_\_\_\_  
PRINTED NAME AND TITLE

SEARCHER Name	OFFICE LOCATION What Office	MANUAL <input type="checkbox"/> if done	ELECTRONIC <input type="checkbox"/> if done	TERMS USED	DOCS FOUND <input type="checkbox"/> if found
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

**RECOMMENDATIONS:**

- ☐ Requested information not under \_\_\_\_\_ jurisdiction; refer/reassign to: \_\_\_\_\_.
- ☐ Responsive documents exist and retrieval will exceed agreed upon fees.
- ☐ Documents should be released in their entirety.
- ☐ Documents should be reviewed for possible redaction/withholding (explain if necessary).
- \_\_\_\_\_
- \_\_\_\_\_