NATIONAL CONSERVATION LANDS

Utah

Beaver Dam Wash National Conservation Area

Annual Manager's Report—Fiscal Year 2016

Table of Contents

1 Beaver Dam Wash NCA Profile

Designating Authority

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

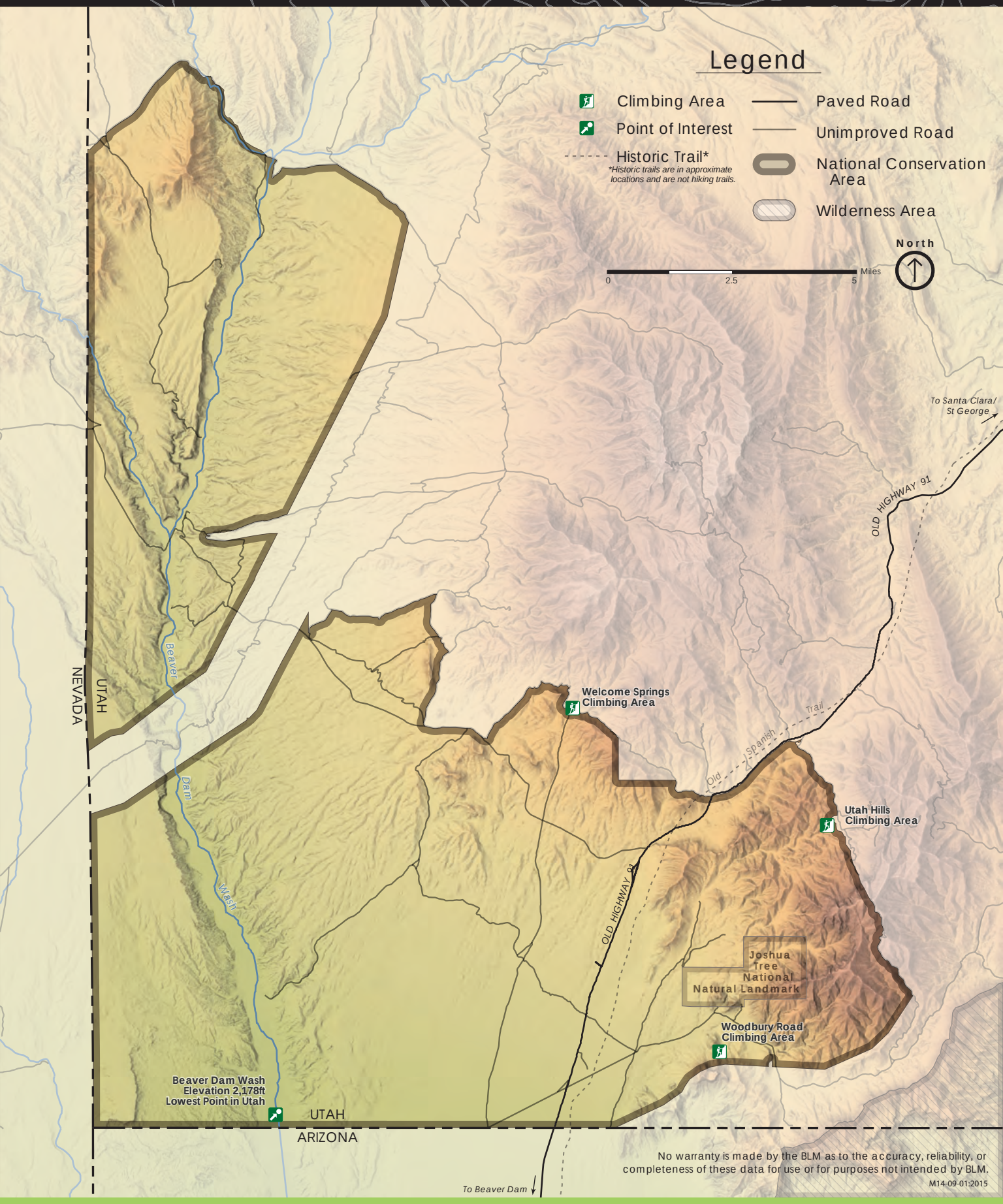
Unit Manager	Phone	E-mail	Mailing Address
Dawna Ferris-Rowley	435-688-3216	d8ferris@blm.gov	Public Lands Information Center 345 E. Riverside Dr. St. George, UT 84790

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



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Budget

Total FY16 Budget	Sub-activity 1711	Other Sub-activities' Contributions	Other Funding
$390,000	$280,000	$110,000	N/A

Managing Partners

N/A

Staffing

The Beaver Dam Wash 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. Approximately 30% of the NCA staff time is devoted to work in the NCAs, the remainder for work on other public lands managed by SGFO; salaries and other costs for work outside of the NCAs are funded by other BLM programs, such as livestock grazing, recreation, wildlife, and wilderness management, etc.

The NCA Biologist is assigned collateral duties as the NEPA Coordinator for the NCAs and the SGFO. The NCA Landscape Architect provides design support to all programs managed by the SGFO and also oversees the development of multi-media interpretive products (e.g., website content, brochures, panels, etc.) for the NCAs and SGFO. One of the NCA Outdoor Recreation Planners is currently assigned collateral duties as the point of contact for the Wilderness Management Program, the Visual Resource Management Program and as the project lead for completion of the OPLMA-mandated Comprehensive Travel and Transportation Management Plan for all public lands in Washington County. The other NCA Outdoor Recreation Planner manages the Special Recreation Permit program for the NCAs and the SGFO and serves as the point of contact for the Wild and Scenic Rivers Program and Cave and Karst Management Program for the NCAs and SGFO and also has a collateral duty assignment as the BLM-Utah Statewide Cave and Karst Program lead. The NCA Manager, GIS Specialist, Biologist, Landscape Architect, and two Outdoor Recreation Planners comprise the

core RMP Planning Team for the OPLMA-mandated Resource Management Plan (RMP) and Environmental Impact Statement (EIS) for the NCA.

Administrative, Lands and Realty, and Rangeland Management staff support for the NCA is provided by the SGFO. Fire Management, Engineering, Force Account/Maintenance, and Budget services are obtained from the Color Country District Office, located in Cedar City, Utah. Two Law Enforcement Rangers are based in the SGFO and conduct regular patrols in the NCA, but are under the supervision of a Lead Law Enforcement Ranger, located in the Color Country District Office.

Headquarters/Visitor Center

The NCA and SGFO management 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 Vermillion Cliffs National Monument (NM). The Dixie-Arizona Strip Interpretive Association (DASIA) supports the management of the interagency Information Center, providing volunteers and staff to assist with public contacts.

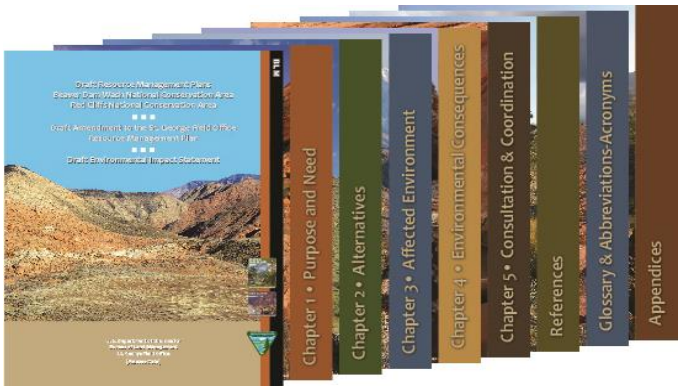
2 Planning and NEPA

Status of the Resource Management Plan

The NCA is currently managed under the *St. George Field Office Record of Decision and Resource Management Plan* (RMP, 1999), as modified by the designation language of OPLMA, at Subtitle O, Title 1, sec. 1975, which mandated the preparation of a new comprehensive management plan. Through OPLMA, Congress segregated the public lands of the NCA from entry under the General Mining Law, the Mineral Leasing Act, the Fluid Minerals Leasing Act, subject to any valid existing rights, and from disposal under the public land laws. The legislative map of the NCA (refer to Map of NCA) identified three areas within the NCA where all public motorized vehicle travel was to be limited to designated roads ("Designated Road Areas") and the specific roads within these areas that were designated for motorized vehicle travel. Outside of the three areas, motorized vehicle travel is limited to roads that will be designated by BLM, through a Comprehensive Travel and Transportation Management Plan that OPLMA directed BLM to complete for public lands in Washington County (OPLMA, Subtitle O, sec. 1979).

In 2010, the SGFO initiated a planning process to prepare new RMPs for the Beaver Dam Wash and Red Cliffs NCAs, as well as a focused amendment for the SGFO RMP, all supported by a single Environmental Impact Statement (EIS). A Notice of Intent (NOI) was published in the *Federal Register* on May 10, 2010 (Vol.75, No. 89: 25876-25877), initiating a 90 day public scoping process that included four public workshops. Washington County, Utah, Mojave County Arizona, and the State of Utah signed agreements to become Cooperating Agencies to the three-part planning process. The Paiute Indian Tribe of Utah and the Shivwits Band of the Paiute Indian Tribe were invited to be Cooperating Agencies but declined. Both continued to be involved throughout the planning process.

Release of the Draft Resource Management Plans/Draft Environmental Impact Statement



The *Draft Resource Management Plans for the Beaver Dam Wash National Conservation Area and the Red Cliffs National Conservation Area and a Draft Amendment to the St. George Field Office RMP/Draft EIS* were released for

a 90 day public review and comment period on July 17, 2015. Notices of Availability (NOA) for the draft plans were published by the EPA and BLM in the *Federal Register* (Vol. 80, No. 137: 42527-42529), announcing the opening of the public comment period. Copies of the Draft RMPs/Draft RMP Amendment /Draft EIS were posted as PDF documents for viewing and download on the BLM website at https://eplanning.blm.gov/. The four alternatives proposed in the Draft RMPs and Draft Amendment included Alternative A, the No Action alternative that represents the continuation of current management practices under the St. George Field Office RMP; Alternative B, the agency's Preferred Alternative; and two other alternatives, Alternative C and Alternative D.

A public comment period ran for 120 days, closing on November 16, 2015. Public open houses were held during the month of September in St. George, UT; Hurricane, UT; and Salt Lake City, UT. Management and staff from the NCAs and SGFO were available to answer questions and assist the public with providing written comments.

Public Comments

During the 120-day public comment period, the BLM received approximately 6,500 written comments; these were submitted at public meetings, through the planning website, e-mail, and regular mail from the public, Cooperating Agencies, other federal and state agencies, Indian tribes, local governments, and organizations. The BLM managers and staff reviewed, categorized, and considered every comment in the development of the Proposed NCA RMPs, Proposed RMP Amendment, and Final EIS. In analyzing comments, the reviewers evaluated the content of the comment, rather than the number of times a comment was received, and prepared written responses to all substantive comments in the Final EIS.

Release of the Proposed Resource Management Plans, Proposed Amendment/Final Environmental Impact Statement

With the publication of an NOA on EPA's website on September 2, 2016, the Proposed NCA RMPs and Proposed Amendment/Final EIS were released for a 30 day protest period and the State of Utah's Governor's 60 day consistency review period. In developing the Proposed RMPs and Proposed Amendment and Final EIS, the BLM had the discretion to combine components of the four alternatives presented in the Draft RMPs and Draft Amendment/Draft EIS. The Proposed Plans included many of the management goals, objectives, and actions identified in BLM's Preferred Alternative, Alternative B.

However, in response to public comments and input from the Cooperating Agencies, other Federal and State agencies, Tribal and local governmental entities, the proposed

plans also included components of the other alternatives that were analyzed in the Draft EIS.

Because only minor edits or clarifications were required between the draft and proposed plans, and none required modifications to the analysis of the environmental consequences presented in Chapter 4 of the Draft EIS, the BLM prepared an abbreviated Final EIS to support the Proposed NCA RMPs and Proposed Amendment, consistent with federal regulations at 40 CFR 1503.4 (c). The abbreviated Final EIS included a summary of the comments received on the Draft EIS, responses to substantive comments, and an *errata* section that showed the specific edits and clarifications that were made in response to comments (40 CFR 1503.4). Appendix E included a table that shows how the Proposed NCA RMPs and Proposed Amendment vary from Alternative B, BLM's preferred alternative, of the draft plans and also included errata. The summary of comments received during the public comment period and responses to substantive comments was provided in Appendix J of the proposed plans.

Biological Assessments

In FY 16, a biological assessment (BA) were prepared by the NCA and St. George Field Office biologists and submitted to the USFWS on September 13, 2016, to initiate formal Section 7 (a) consultations, pursuant to the Endangered Species Act (ESA), for the Proposed RMP for the Beaver Dam Wash NCA / Final EIS. The assessment analyzed the potential effects on those plant and animal species that occur or have the potential to occur in the NCA area and that are currently listed as threatened and endangered species or managed as 10 (j) experimental, non-essential populations.

Section 106 Consultations

Consultations under the authority of Section 106 of the National Historic Preservation Act (NHPA) were conducted with the Utah State Historic Preservation Officer (USHPO) relating to management decisions contained in the Proposed NCA RMPs and Proposed Amendment to the St. George Field Office RMP/Final EIS. In a letter dated September 20, 2016, the USHPO concurred with BLM determination that approval of the management decisions identified in the proposed plans, through the signing of Records of Decision for the RMP for the Beaver Dam Wash NCA, will result in No Adverse Effects to historic properties.

Tribal Consultations

Consultations related to this planning process have been conducted with the following Tribes and Bands which claim cultural affiliation to the NCA and southwestern Utah:

The Hopi Tribe

The Navajo Nation

The Pueblo of Zuni

The Paiute Indian Tribe of Utah

- Shivwits Band
- Cedar Band
- Indian Peaks Band
- Kanosh Band
- Koosharem Band

The Kaibab Band of Paiutes

Status of the RMP Implementation Strategy

A Record of Decision was signed for the Beaver Dam Wash NCA Resource Management Plan in early fiscal year 2017 (December 21, 2016). As the RMP was not approved in fiscal year 2016, the RMP Implementation Strategy was not prepared during the period covered by this report.

Status of Activity Plans

Comprehensive Travel and Transportation Management Plan

Initial public scoping for the Travel and Transportation Management Plan (TMP) was conducted during the four scoping workshops that were held in June of 2010 for the RMP-level planning efforts. A Scoping Report was completed in October, 2010 and issues identified through scoping used to develop the range of management alternatives for the draft TMP. Informal scoping with various Federal and State agencies, Tribes, local governments, and diverse public land user groups has been on-going since 2010. Evaluations have been completed for all routes on public lands in Washington County (2,800 miles), including those within the NCA that are available for public travel. Four draft management alternatives were provided to the Cooperating Agencies (Washington County and the State of Utah, through the Office of the Governor's Public Lands Coordination Office) for review and comments. The BLM staff made any needed changes to the alternatives, based on the comments provided by the Cooperating Agencies.

During FY16, BLM staff worked with an environmental services contractor (Applied Resources Solutions) to prepare an Environmental Assessment (EA) to satisfy the

NEPA requirements of the TMP. The Draft TMP/ EA are scheduled for release for public review and comment in 2017.

Key National Environmental Policy Act Actions and/or Project Authorizations

Release of the Proposed Beaver Dam Wash NCA RMP and Final EIS was the key planning and NEPA action in the NCA during fiscal year 2016.

3 Year's Projects and Accomplishments

General Accomplishments

Fire-Damaged Habitat Restoration Program

In FY15, Watershed Restoration Initiative funding was granted by the Utah Partners for Conservation and Development (UPCD) to support a multi-year experimental habitat restoration program in fire-damaged tortoise critical habitat in the Beaver Dam Wash NCA, based on a joint proposal submitted by the Utah Division of Wildlife Resources (UDWR) and BLM. 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 native shrubs, forbs, and grasses that are beneficial to desert tortoise and other wildlife.

This program is also supported by funding from multiple sources, including the BLM, UDWR, The Nature Conservancy, the National Fish and Wildlife Service Foundation, and from Washington County's Habitat Conservation Plan Administrator's Office. A Cooperative Agreement was signed in 2015 between the University of Nevada, Las Vegas (UNLV) and UDWR to allow the transfer of funding to UNLV's Department of Restoration Ecology to provide 5,000 mature containerized plants of seven native species for this program. Dr. Dale Devitt from UNLV is responsible for providing the containerized plants and in the spring of 2016, he acquired locally-sourced seeds from NCA staff and commercial sources and began propagation at UNLV's greenhouse facilities.

Biologists and botanists from the BLM, UDWR, the U.S. Fish and Wildlife Services, and UNLV selected a 100 acre site in the NCA, as the first habitat restoration research area. The research site was located within the 1,063 acre Woodbury-Hardy Desert Study Area (Study Area), as the boundaries of the Study Area are fenced and it is managed as unavailable for domestic livestock grazing. In this Study Area, Woodbury and Hardy conducted their pioneering studies of the Mojave desert tortoise during the 1930s and it has been an important area for Mojave Desert research since that time. A GPS-based grid was overlaid on this 100 acre site and 350 equally-sized smaller research plots were established within that grid, with pin flags denoting the center of each plot. The plots were inventoried and data collected on the native vegetation species and exotic and invasive annual grasses and forbs that have regrown since the area was damaged by a large wildlife in 2006.

Dr. Devitt and Dr. Scott Abella, also with UNLV's Department of Restoration Ecology, helped to develop a planting plan and provided other support for the initial planting in the Beaver Dam Wash NCA, scheduled for early November of 2016. Approximately 5,000 containerized plants, consisting of seven native species: creosotebush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinose*), big galleta (*Pleuraphis rigida*), desert globemallow (*Sphaeralcea ambigua*), bush muhly *(Muhlenbergia spp*.) and Astragalus (*Astragalus* spp.) will be planted and protective wire cages will be placed around all but the creosote bush plants, to protect them from small mammal herbivory. Plants in alternate research plots will be planted with an artificial water gel "(Dri Water"), so that an evaluation can be made as to whether the use of artificial water increases their survival rate.

The success of the out-plantings, with the variables identified in the planting plan, will be monitored over the initial four-year term of this restoration program. If out planting proves to be a successful and cost-effective restoration method, over time, additional plots will be strategically located in the Study Area and other fire damaged areas of the NCA, to create "fertile islands" that will act as seed banks from which native plants can naturally propagate and disperse seeds.

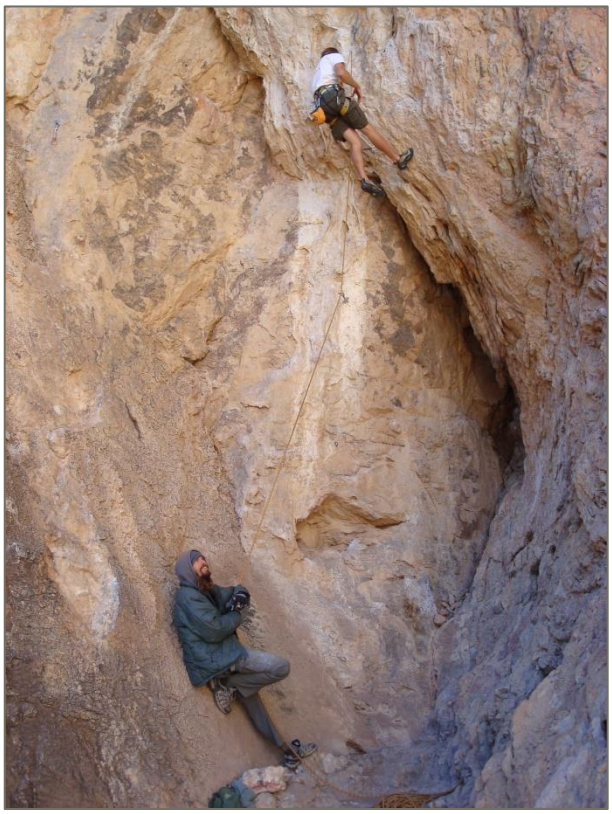
Livestock Grazing Administration and Rangeland Health Monitoring

Administrative actions related to livestock grazing management and data collection related to rangeland health were completed for the three allotments that are entirely or partially within the NCA boundaries: the Beaver Dam Slope Allotment, Castle Cliff Allotment, and the Scarecrow Peak Allotment, A fourth allotment, the Cedar Pockets Allotment, overlaps the NCA boundaries but is administered by the BLM Arizona Field Office. Precipitation data was collected from rain gauges at two locations within the NCA; data from these locations have been collected for over 30 years, allowing comparisons to be made between past and current precipitation regimes. A new rain gauge was installed in the Woodbury Desert Study Area in the research site where out-plantings of native species will occur in FY17. This will allow the site-specific collection of precipitation data to inform the habitat restoration research project.

Utilization data, defined as "the portion or degree, expressed in a percent, of the current year's growth that is consumed or destroyed by foraging animals", was evaluated on key forage species used by livestock in the three allotments. Data on utilization were collected at multiple monitoring sites across the NCA, selected based on topography, observed changes in vegetation communities, and distance from water sources.

Data on noxious weed infestations in the NCA, including species and location, were encoded in the NISMS database and small scale infestations eradicated, using hand tools wherever they were encountered.

Recreation Management



NCA staff monitored visitor numbers and uses within the NCA, through visitor contacts and digital traffic counters placed at entry points to 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 FY16 was 22,000, while the number of visits totaled 9,700.

Eight Special Recreation Permits (SRP) are currently authorized for commercial activities in the NCA that include guided rock climbing, big game hunting, and wilderness therapy programs. The photo at left shows a guided rock climb, authorized under one of the commercial SRPs.

Current Area of Focus

The Proposed NCA RMP/Final EIS were released on September 2, 2016, for a 30 day protest period. The remainder of FY 16 focused on preparing the Beaver Dam Wash NCA Record of Decision and approved RMP for signature by the BLM-Utah State Director, which was completed in early FY 17. Completion of the OPLMA-mandated Comprehensive Travel and Transportation Management Plan for public lands in Washington County will continue to be a high priority of the NCA management and staff. The release of the draft TMP in 2017 is expected to generate considerable public interest and require a commitment of staff time to respond to public comments.

Education, Outreach, and Interpretation

National Conservation Lands Sign Installation

In FY 16, 9 new special designation and recreation signs were installed in the NCA, at major road entry points and at each trailhead or recreational site. These signs, which featured the new National Conservation Lands graphics and design, were placed either on wood posts or on new stone veneer bases, depending on sign type. Seven new information kiosks, either 2 or 4 sided self-rusting roofed steel style kiosks, were installed in the NCA at major road entry points. The bases for all NCA portal signs were replaced with stone veneer bases.

Public Information Center Brown Bag Programs

Weekly "Brown Bag" programs are offered on Fridays at noon in the interagency Public Information Center and feature guest speakers who provide information on local history, natural and cultural resources, and other topics of interest to the general public. In FY16, one of the weekly Brown Bag programs, presented by David Lee of the Western Rock Art Research Association, highlighted the abundance of Native American rock art (petroglyphs and pictographs) that are preserved in Washington County, UT, including sites located in the Beaver Dam Wash NCA.

Partnerships

Southern Utah National Conservation Lands Friends (SUNCLF)

Management of the Beaver Dam Wash NCA continues to be supported by the Southern Utah National Conservation Lands Friends (SUNCLF), a 501 (c) (3) non-profit "friends" group, through a Cooperative Assistance Agreement. SUNCLF assists BLM with volunteer stewardship programs, environmental education outreach, and special projects. In FY16, SUNCLF helped to provide information about the NCA at local events, such as "Take it Outdoors Day" and "Junior Ranger Day ".

SUNCLF also hosted a one day public Photography Workshop in May of 2016, instructed by BLM's master photographer Bob Wick. The workshop included a classroom session at the Interagency Public Information Center in St. George, during which attendees were shown methods to improve their photographs of landscapes and people. Following that session, workshop attendees could join Bob in the Beaver Dam Wash NCA for field training on night sky photography.

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 and the lectures are hosted by DASIA staff.

Volunteers

Volunteers donated more than 200 hours of time to assist with resource monitoring in the NCA. As examples:

- Site stewards, who monitor archeological and paleontological sites in the NCA, donated more than 50 hours of volunteer time;
- Trail Stewards from the Old Spanish National Historic Trail Association monitor trail conditions along the Main and potential Armijo Routes of the Old Spanish National Historic Trail through the Beaver Dam Wash NCA on a quarterly basis; and
- Graduate students from the University of Nevada, Las Vegas and other volunteers assisted the NCA Biologist with the evaluation of native vegetation species occurrence and density in the 100 acre habitat restoration research site.

Land (or Interests in Land) Acquisitions

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

4 Science

Science Plan

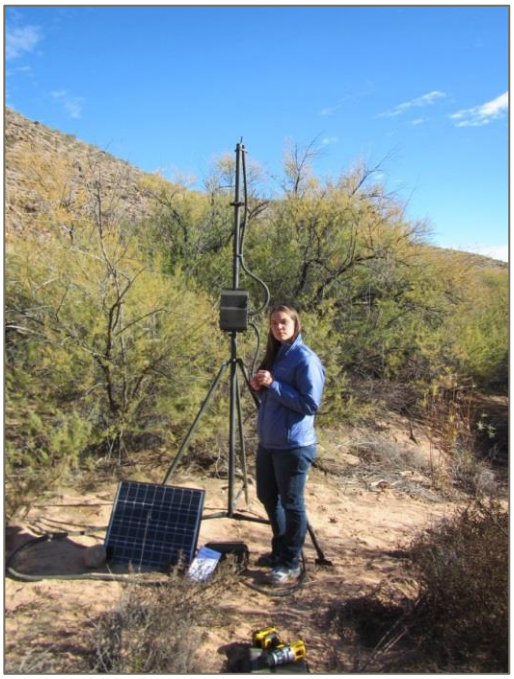
A Science Plan has not yet been formalized for the Beaver Dam Wash NCA. However, some of the opportunities for research that would inform the long-term management of the NCA were identified in the management alternatives included in the Proposed NCA RMP/Final EIS. These opportunities will be included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

In FY 16, an informal working group comprised of the NCA Manager, NCA Archeologist, NCA Biologist, UDWR biologists, faculty from the Biology and Earth Sciences Departments of Dixie State University, SUNCLF, and local volunteers met on a regular basis to share information and discuss short and long-term research needs and opportunities in the NCA. The group determined that the near-term focus of research should be on furthering the Habitat Restoration Research Program in the NCA, by increasing the availability of locally-sourced native seeds and mature containerized native plants. Dr. Erin O'Brien from Dixie State University 's Biology Department offered the use of its greenhouse and students to propagate of native species, while SUNCLF and local volunteers committed to assist with native seed collection, under the direction of BLM staff; both initiatives are planned to start early in FY 17.

USFWS Annual Monitoring Studies for Mojave Desert Tortoise

Biological field teams from the USFWS Tortoise Recovery Program conducted annual desert tortoise monitoring, using line distance transects to detect tortoises and sign within approximately 15,000 acres of the NCA. The objectives of the 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 Tortoise Conservation Areas (TCAs). The NCA is within the Beaver Dam Slope TCA, which covers areas of southern Nevada, the Arizona Strip, and southwestern Washington County, Utah. A report detailing the results of this year's monitoring studies will be made available by the USFWS in FY 17.

Acoustical Bat Monitoring Studies



In FY 15, funding from a small grant proposal to the BLM's National Cave and Karst Management Program was used to purchase an ultrasonic bat recorder and an iPad, to test the feasibility of using stationary and portable recorders to identify bat species and distribution in the NCA. The success of the initial studies using a single recorder prompted the acquisition of four additional recorders and a second iPad in FY 16. A permanent ultrasonic bat recorder is now located in the Beaver Dam Wash NCA, and shown in the photo to the left. With the use of the two mobile iPads and identification software, it has been possible to record bat calls at multiple locations within the NCA.

The acoustical data collected is processed through specialized software that analyzes each bat call and provide species identification and call signature in full wave spectrum and zero cross referencing formats. A geodatabase was created in GIS to capture all relevant data, such as bat species identified, location, date, ecological setting, and meteorological conditions. Using these data, models can be created for species/habitat distribution and diversity. Of the 18 bat species reported to occur in Utah, 16 have been identified in the NCA, through the acoustical monitoring studies. Additionally, the data expanded the known range of the Greater Mastiff Bat into the NCA and other areas of Washington County.

Kit Fox (*Vulpes macrotis*) Study

In FY 16, a long-term monitoring study of kit fox vigilance behaviors that involved sites in the NCA was concluded by researchers from Brigham Young University (BYU), working in partnership with the BLM and UDWR. Kit fox are small, solitary carnivores who are often themselves the subject of predation by larger predators, like bob cats, mountain lion, and coyotes. Researchers from BYU theorized that kit fox vulnerability to other predators would be increased at water sources, particularly in arid environments like the Mojave Desert, where natural water sources are limited in number. To test various hypotheses about kit fox vigilance related to predation, they proposed to study these behaviors at developed water sources, as surrogates for natural sources, as these, too, create locations where

predators and prey often concentrate. The research design for the study proposed to test three hypotheses regarding vigilance behavior for kit fox at developed water sources. These hypotheses considered, among other factors, whether the area around the water source was surrounded by vegetation that obstructed visibility and provided cover from predators and how the presence or absence of such protective cover influenced vigilance behavior. The study area in the Mojave Desert was located between the Beaver Dam Mountains and the Beaver Dam Wash, primarily within the Beaver Dam Wash NCA. Twenty-five developed water sources, which included artificial water developments for wildlife, aka guzzlers, and water troughs for domestic livestock, were randomly selected as the locations for the establishment of scent stations and remote cameras to observe kit foxes and their vigilance behavior. Infrared-triggered cameras were set up approximately 2 meters away from each water source, so that the camera's field of view captured all activity along the edge of the water where animals drank. When the cameras were triggered, they recorded one photo and then 20–30 seconds of video. As a result of the photographic data collection over a multi-year period, researchers were surprised to find that kit fox showed proportionately greater vigilance at water sources where vegetation or other factors obstructed visibility and less vigilance where such obstructions were not present (Hall et. al., 2013).

Citation: Lucas K. Hall (a),∗, Casey C. Day (a), Matthew D. Westover (a), Robert J. Edgel (a), Randy T. Larsena,(b),Robert N. Knight (c), Brock R. McMillan (a) Vigilance of kit foxes at water sources: A test of competing hypotheses for a solitary carnivore subject to predation, Elsevier, Volume 94, March 2013:pp 76-82
(a) Department of Plant and Wildlife Sciences, Brigham Young University, Provo, UT, USA
(b) Monte L. Bean Life Sciences Museum, Brigham Young University, Provo, UT, USA
(c) Environmental Programs, US Army Dugway Proving Ground, Dugway, UT, USA

Floral Orientation Studies in Joshua trees (*Yucca brevifolia jaegeriana*)

In FY 16, the results of study conducted in the Beaver Dam Wash NCA on the directional orientation of Joshua tree flowers were published (Warren, Baggett, and Warren (2016). In the spring of 2012, researchers from the USDA Forest Service's Rocky Mountain Research Station (Provo, UT) collected observational data from 50 randomly selected Joshua trees related to directional orientation of their flower panicles(refer to photo of Joshua trees above). They theorized that the flower panicles of this native yucca would be located on the southern sides of each plant, maximizing solar energy absorption and helping to off-set the high energy costs of flower production. Their findings demonstrated that, despite the semi-random distribution of the branches of the Joshua tree around the central bole of the plant, for the 50 sampled Joshua trees, a clear majority of the flower panicles were located on the southern side of the plant. Where the branches were not located on the southern side

of the plant, the flower panicles were observed to orient to the south. The authors concluded that a southern orientation for the flower panicles increased their nitrogen concentration and raised the ambient temperature within the panicles. Warmth radiating from within the panicles attracted yucca moths (*Tegeticula antithetica*), nocturnal pollinators which are only active for a few hours each evening. The warm environment within the flower panicles appeared to extend the period of pollinating activity by the moths, potentially resulting in greater reproductive success for Joshua trees.

Citation: Warren, Steven D (a), L. Scott Baggett (b), and Heather Warren 2016 Directional Floral Orientation Studies in Joshua trees (*Yucca brevifolia jaegeriana*), *Western North American Naturalist* 76 (3), 2016, pp 374-378).
(a) USDA Forest Service, Rocky Mountain Research Station, Provo, UT, swarren02@fs.fed.us
(b) USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO, lsbaggett@fs.fed.us
Salem, UT, longgone8@msn.com

View of Joshua trees in the NCA

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. 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. These are but a few of the resource values that make the public lands of the NCA worthy of inclusion in BLM's system of National Conservation Lands and include the following:

- Ecological diversity created by the convergence of the Mojave Desert and Great Basin ecoregions;
- 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;
- Joshua Tree National Natural Landmark, exemplifying this iconic Mojave Desert vegetation community, at the northern extreme of its range;
- 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 OST, 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, the early 20th century Arrowhead Trails Highway, and features constructed by the Civilian Conservation Corps during the Great Depression of the 1930s.

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 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

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, are found at higher elevations in the NCA.

The ecological health of the upland vegetation communities was initially evaluated 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 being conducted in each community, with the acreages completed in FY16 shown in the table below.

Status of Native Upland Vegetation	Trend
Fair	Stable

Inventory, Assessment, Monitoring of Native Upland Vegetation			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY16
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: 500 Blackbrush: 250 Pinyon-juniper: 5 Mountain shrub-0 Big Sagebrush-5

Riparian Vegetation

Warm desert riparian and riparian wash vegetation was mapped and the ecological health of these communities initially 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 FY16**
63,480	Warm Desert Riparian:114 Warm Desert Riparian Wash: 3,345	Warm Desert Riparian:114 Warm Desert Riparian Wash: 3,345	Warm Desert Riparian:50 Warm Desert Riparian Wash: 25

Stressors Affecting Ecological Resources

Wild fires, exotic invasive annuals, and predicted drought that benefits 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 is primarily being 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 impact surface water quality. Exotic salt cedar (*Tamarack* spp.), has invaded the riparian areas and competes with native species. New exclosure fencing around the Welcome Springs complex is helping to protect the riparian vegetation at the spring sources and along a portion of Welcome Creek from further livestock grazing and motorized vehicle-related damage. While a majority of the fencing is outside of the NCA, it will protect some riparian vegetation within the unit.

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 federally-listed threatened Mojave desert tortoise (*Gopherus agassizzi*) is known to occur in the NCA and data area collected annually on population trends and habitat conditions by BLM and the USFWS. Two avian species, the Southwestern willow flycatcher (*Empidonax traillii extimis*) and Western yellow-billed cuckoo (*Coccyzus americanuss occid*entalis), are currently 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

Inventory, Assessment, Monitoring Table of Tortoise Critical Habitat		
Acres in Unit	Acres of Critical Habitat	Acres Monitored in FY16
63,480	50,900	15,000

Stressors Affecting Mojave Desert Tortoise

Wild fires, exotic invasive annuals, and predicted drought that benefits invasive species are the primary stressors affecting critical the Mojave desert tortoise. The creosote-bursage community, which comprises a majority of the critical habitat, has not been damaged by recent wild fires, but remains at high risk because invasive brome grasses are present throughout this community. Approximately 80% of the blackbrush-Joshua tree shrublands in the NCA have been damaged by 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. Nutritional deficiencies impair the reproductive success of desert tortoises, while inadequate shade cover increases the potential for tortoise mortalities as a result of exposure to summer heat and predation.

Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo

Both of these birds are currently listed under the Endangered Species Act 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 FY16
63,480	63,480	114	50

Stressors Affecting Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo

Habitat loss to developments and infestations by exotic invasive species, such as giant reed (*Arundo donax*) and tamarisk (*Tamarack spp.*) that degrade riparian areas, are the principal stressors on these species. Prolonged droughts and weather pattern scenarios could also impact the survival of willows and cottonwood trees that provide critical nesting and foraging habitat.

Scientific Resources: Geological, Paleontological, Cave and Karst Values

In southeastern 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 that contain unique biota or preserve cultural resources, as illustrated by the photo above showing a view of "Icicle Cave".

In FY 16, three previously identified caves in the NCA were mapped and inventoried for resource values and found to contain faunal bones in the floor sediments. These faunal remains would be suitable for additional paleontological studies to identify the genus and species present and could also be dated, using radio-carbon or accelerated mass spectrometer dating methods.

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 FY16**	**Localities Monitored in FY16**
63,480	63,480	0	5

Inventory, Assessment, Monitoring of Cave and Karst Resources				
Total Acres of Unit	**Acres Previously Inventoried**	**Acres Inventoried in FY 16**	**New Caves Recorded in FY16**	**Caves Monitored in FY16**
63,480	500	100	0	3

Cultural and Historical Resources

The NCA land base has been occupied and used by many cultural groups over the broad expanse of human history. Evidence of this 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, Formative Period Ancestral Puebloans and later Ancestral Numic-speaking groups, is found in campsites, rock shelters, and occupation sites. Modern Southern Paiute people also used this area, hunting and collecting native plants and cultivating 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 exist and will be of significant scientific value.

The NCA was also 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 U.S. Highway 91. From 1829 until about 1850, mule pack train used this pack trail that was 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 legislatively-depicted Northern Route and the potential Armijo Route crossing the NCA.

In FY 16, approximately 20 acres were inventoried at Class III level by an archeological services contractor in the NCA related to proposed maintenance work by Washington County within its right-of-way along Old Highway 91. This inventory resulted in documentation of two new archaeological sites and updated recordings of four previously recorded sites within and immediately adjacent to the highway right-of-way. These sites included historic roadways that intercepted Old Highway 91, as well as the remains of two early 20th century service stations located adjacent to the highway.

Class III inventory was also completed by the NCA archeologist of the proposed 100 acre habitat restoration research site in the Woodbury Hardy Desert Study Area. Isolate finds that included tin cans and bottles dating to the first decades of the 20th century were documented and presumed to be related to historic sheep herding activities on the Beaver Dam Slope.

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 FY 16	Sites Monitored in FY16
63,480	4,500	120	15

Stressors Affecting Cultural and Historical Resources

Stressors on cultural and historical resources include human-caused impacts and surface disturbances related to vandalism and theft of artifacts. 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.

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 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 game bird hunting, nature photography, and ATV/UTV riding on the network of unpaved roads that cross some areas of the NCA. In 2016, the estimated number of visits was 23,000, the estimated number of visitor days 9,700. 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.

Status of Recreation Resources	Trend
Good	Stable

Inventory, Assessment, Monitoring of Recreation Resources			
Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY16
63,480	63,480	63,480	5,000

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.

Naturalness

Lands with Wilderness Characteristics

The naturalness of the NCA can be inferred based on the results of inventories completed by BLM for the presence or absence of wilderness characteristics in the NCA. These characteristics include size, naturalness, outstanding opportunities of solitude and outstanding opportunities to primitive and unconfined recreation. The results of the inventories and evaluations indicate that 69% of the public lands in the NCA possess wilderness 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 FY16
63,480	63,480	43,870	1,500

Stressors Affecting Naturalness

Wild fires, exotic invasive annuals, and predicted drought that benefits 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.

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. Wide panoramic views can be seen from most hilltops. A Visual Resource Inventory was completed by BLM for the NCA which rated the scenic qualities of the NCA, according the four classes used by 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**	**Acres Monitored in FY16**
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

Stressors Affecting Scenic Resources

Wild fires, exotic invasive annuals, and predicted drought that benefits 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.

View of Beaver Dam Mountains in the NCA

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 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.*

As Congress did not specifically define a majority of the resource values that give significance to this NCA, and benchmarks have not yet been established through a Science Plan, the following assessment focuses only on those ecological values currently being monitored in the NCA.

Summary Table*		
Resource, Object, or Value	**Status**	**Trend**
Ecological/Natural	Fair to Good	Stable
Wildlife: T&E	Fair	Stable
Scientific	Good	Stable
Cultural/Historical	Good	Stable
Recreational	Good	Stable
Naturalness	Good	Stable
Scenic	Good	Stable

7 Manager's Letter

Dear Friends of the Beaver Dam Wash NCA:

The Manager's Annual Report highlights just a few of the activities and projects that we completed this year to conserve and protect resource values in the NCA during fiscal year 2016. Our efforts were furthered by contributions from many dedicated volunteers, community partners, researchers, and members of the public who support the purposes for which this NCA was designated by Congress in 2009.

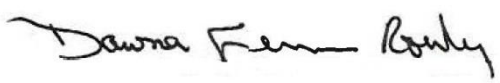
We were particularly pleased to be able to release the Proposed Resource Management Plan (RMP) for the Beaver Dam Wash NCA/Final EIS for public review, after reviewing nearly 6,500 comments submitted by the public, other Federal and State agencies, and the Cooperating Agencies to this planning process. This input has helped us to develop comprehensive long term goals, objectives, and management actions that will have significant positive impacts on the natural and cultural resources of the NCA. We look forward to having a Record of Decision signed that approves a new RMP for the NCA by the end of 2016.

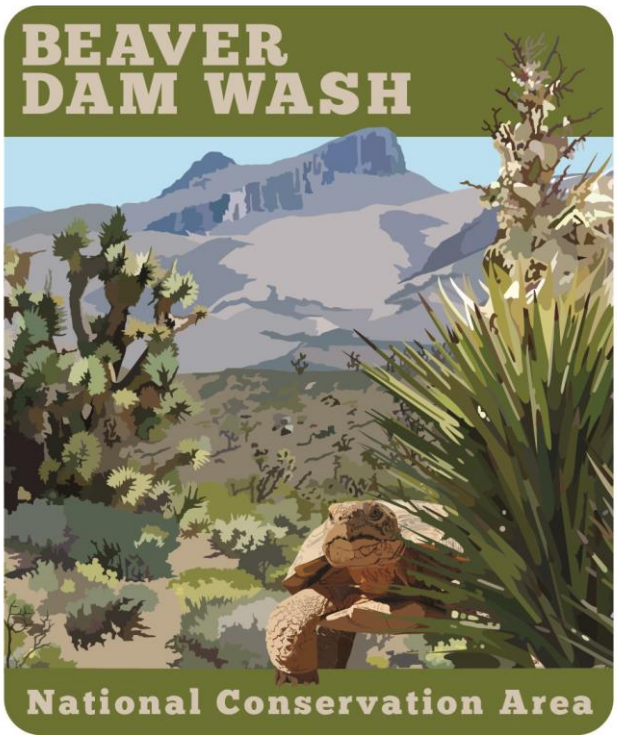
In the next year, our focus will also be on the following:

- Developing an Implementation Strategy for the approved Beaver Dam Wash NCA RMP;
- Engaging the public and soliciting input from all affected parties on the Draft Comprehensive Travel and Transportation Management Plan for Washington County that will be released in 2017;
- Initiating the planting phase of the large scale fire damaged habitat restoration project;
- Supporting SUNCLF in its efforts to increase public awareness and provide opportunities for volunteers to assist with projects and programs that further the purposes of the NCA;
- Developing new partnerships with local schools and academic institutions, like University of Nevada-Las Vegas and Dixie State University, to engage faculty and students in NCA restoration 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

January 20, 2017

NATIONAL CONSERVATION LANDS

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