



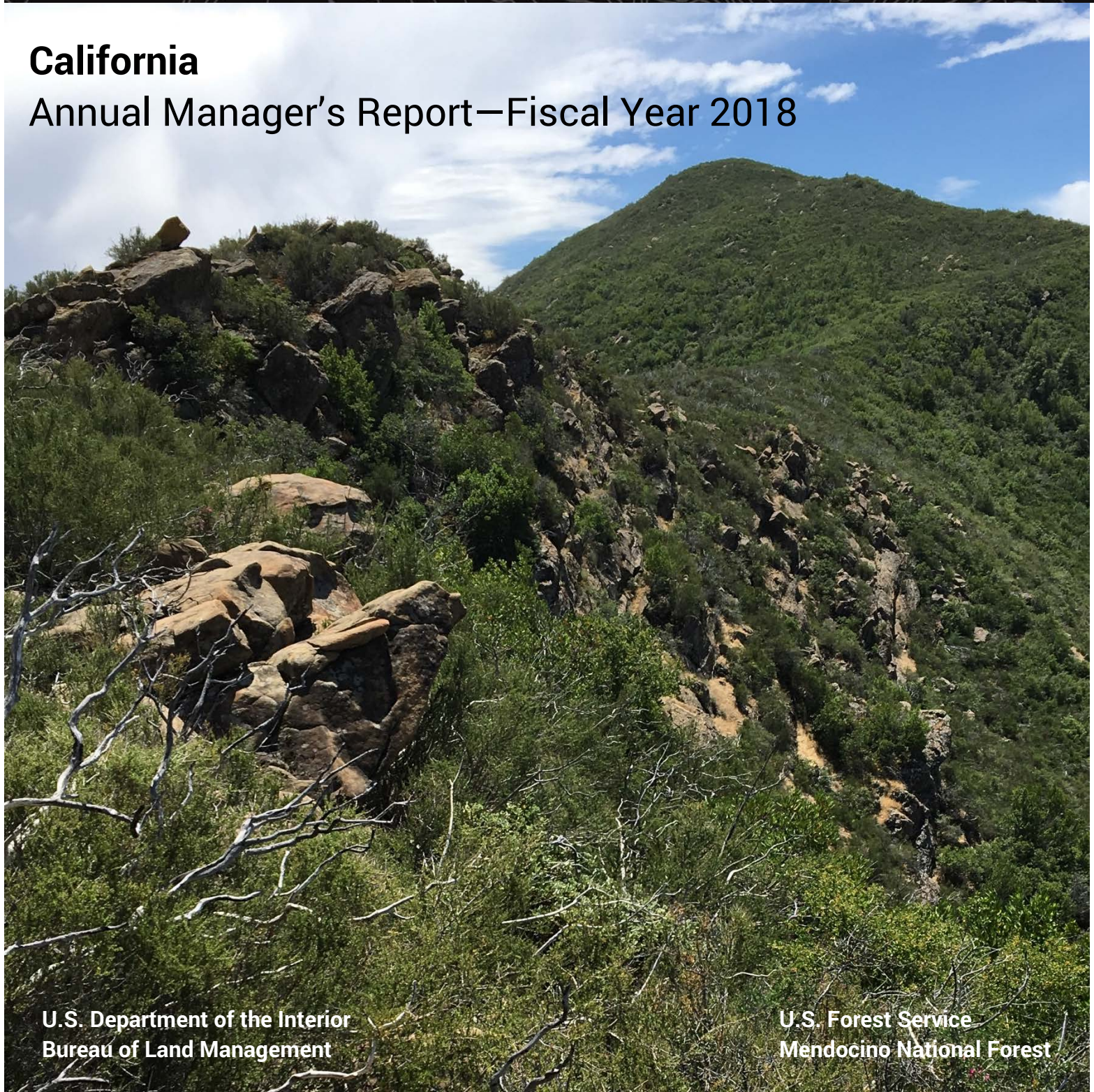
**NATIONAL  
CONSERVATION  
LANDS**

# Berryessa Snow Mountain

National Monument

**California**

Annual Manager's Report—Fiscal Year 2018



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

U.S. Forest Service  
Mendocino National Forest



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

# Berryessa Snow Mountain

National Monument

## Designating Authority

**Designating Authority:** Presidential Proclamation #9298, Antiquities Act (34 Stat. 225, 16 U.S.C. 431)

**Date of Designation:** July 10, 2015

## Managing Partners

The Bureau of Land Management and United States Forest Service each manage the portion of the lands within the monument.

## Additional Designations

Berryessa Snow Mountain National Monument (BSMNM) includes three designated wilderness areas: Snow Mountain, Cache Creek, and Cedar Roughs. Cache Creek is designated as a Wild and Scenic River under the California Wild and Scenic Rivers Act. The monument also includes five Areas of Critical Environmental Concern (ACECs).

## Site Description

The Berryessa region exhibits some of the most scenic and biologically diverse landscapes in California. BSMNM encompasses 330,780 acres that are rich with cultural significance and provide important habitat for plants and wildlife. They range from rolling, oak-studded hillsides to steep creek canyons, forests, and stunning ridgelines with expansive views. To the north, Snow Mountain Wilderness provides a unique outdoor experience with forested trails and lush waterfalls. Further south, the Cache Creek Wilderness and Berryessa Peak provide exceptional opportunities for researchers and recreationists. Native American cultural legacies are an important component of this landscape. Hydrologic resources that continue to shape this landscape provide a water source for diverse plant and animal communities, several of which are endemic to the Berryessa region.

## Monument Offerings

The monument is within driving distance of Sacramento and San Francisco. Hiking and mountain biking clubs use the trails on both BLM and USFS managed lands. OHV

and equestrian riders host events and competitions in this area and provide important volunteer support for BSMNM. Partner groups lead organized camping excursions. Other uses include backpacking, nature watching, hunting, fishing, birding, swimming, kayaking, paragliding, and whitewater rafting.

### **Year Accomplishments**

The monument offered many recreational and educational opportunities in 2018. BLM and USFS worked with non-profit partners, schools, and state agencies to provide a total of 24 programs in fiscal year 2018. Examples include Bald Eagle hikes, elementary school trips, research projects, workshops, camping trips, and even a partner-sponsored rafting trip. Five interns received career training, conducted resource survey work, and supported public outreach efforts. BLM grazing permits were active for four allotments. The Cache Creek Ridge Ride and North American Trail Ride Conference offered equestrian events in the Cache Creek Natural Area. Commercial guides led river trips within the monument.

### **Future Priorities and Opportunities**

Baseline information that was collected in 2018 will provide a basis for future monument planning efforts. New partnership opportunities were identified through workshop participation and continued community support. BSMNM will continue to work with partners to provide school trips, youth engagement opportunities, and develop informational products that tell the BSMNM story. Fire rehabilitation efforts from several 2018 wildland fires will be a primary focus in 2019. Mendocino National Forest is currently preparing an analysis of existing guidance for the management of USFS lands within BSMNM. USFS will request public input on this document in 2019. Both agencies continue to foster existing partnerships and invite new opportunities.

## **Berryessa Snow Mountain**

### **National Monument**

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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.

# 1 Berryessa Snow Mountain Overview

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## Acreage

<b>Total Acres in Unit</b>	330,780
<b>BLM Acres</b>	133,576
<b>USFS Acres</b>	197,204
<b>State Acres*</b>	0
<b>Private Acres*</b>	0

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

## BLM Budget

Budget Title	Code	Funding
Monuments & Conservation Areas	1711	141,575
Rangeland Management	1020	18,134
Riparian Management	1040	20,996
Wilderness Management	1210	45,821
Recreation & Visitor Services	1220	188,379
Other (DHA Internships)	1610	25,640
Other Federal (USFS)	1920	79,712
Other (CADR Initiative)		32,636
Total BLM Budget		\$ 473,181

## Current Areas of Focus

Resource data collection and fostering partnerships are crucial for the success of monument management and planning. Agency staff worked with partners and contractors to conduct several inventory and monitoring projects. These efforts provide data that forms the basis for future planning, management, and the development of educational opportunities. An interdisciplinary team of resource specialists from both agencies identified data needs for monument management. Based on this assessment, BLM conducted several resource inventories in 2018 and will continue these efforts in 2019. Examples include an archeological context report, visual resources inventory, transportation route inventory, proper functioning condition of riparian habitats monitoring, visitor use counts, and working with partner organizations to digitize and model resource information.

Responding to collaboration requests and fostering mutually beneficial relationships is a high priority for BSMNM. Collaborative research, education, and recreational opportunities were identified during agency and partner sponsored workshops.



Partner collaborations made it possible for BSMNM to offer five career development internships for recent graduates in 2018. More information about this may be found in the partnerships section of this report.

The 2018 fire season posed a challenge for resource surveys, monument projects, and proposed infrastructure projects. Six wildland fires occurred within BSMNM in 2018, including the Mendocino Complex, reputed as the largest fire in California History. Together, these fires covered approximately 56% of the total BSMNM lands that are cooperatively managed by BLM and USFS. Agency priorities shifted to respond to community and resource needs related to these fires. Resource data compiled in 2018 will help to guide future management and planning approaches. Interagency Burned Area Emergency Rehabilitation (BAER) teams assessed fire impacts and agency staff are addressing the issues identified by BAER teams. These efforts will continue in 2019.

## Staffing

Approximately 40% of BSMNM lands are managed by the BLM field Office and 60% of BSMNM lands are managed by USFS Mendocino National Forest (38% by the Upper Lake and Covelo Ranger Districts and 22% by the Grindstone Ranger District). An Interagency Monument Management Team meets regularly to guide the planning and operational management of BSMNM. The monument has one, full time, permanent staff member who is funded jointly by the BLM and USFS through a Service First Agreement. BLM employs this position and Mendocino National Forest funds approximately 40% of associated employment costs for that sole, monument-dedicated position. Federal employees from both agencies who were funded to support federal land management before the monument designation in 2015, continued to provide the same level of shared resource and management services.

Each agency evaluates project and staff funding requests on a case-by-case basis. In 2018, supplementary staffing was provided through the Hispanic Access Foundation Resource Assistant program. This program works under an agreement between the USFS and Hispanic Access Foundation. The BLM also provided four internships through their Direct Hiring Authority program and a contract with the American Conservation Experience (ACE). These ACE interns and the Resource Assistant worked side by side with a BLM seasonal Park Ranger and other shared agency staff to develop career skills and support the accomplishments outlined in this report.

## 2 Programs and Accomplishments

### General Accomplishments

Due to strong support from nonprofit partner organizations, BSMNM was able to host more educational, recreational, and community outreach programs this year. School programs, nature hikes, volunteer projects, workshops and a celebration of the 50<sup>th</sup> anniversary of scenic rivers and trails acts were hosted on BSMNM lands. Booths were set up at schools, tribal events, county fairs, and local events to provide information about the monument and request input from our public.

Enhanced visitor use tracking was also proposed for BSMNM in 2018. New visitor trail counters were installed on BLM lands and the USFS embarked on a visitor use survey, but wildland fires interrupted these counts. The following numbers provide an estimate of visitor use on BLM lands. They do not include visitor counts on USFS lands, nor do they include information station contacts made during firefighting operations. Since Mendocino Complex fires began on July 28 and were not fully contained until October 19, 2018, visitation numbers were negatively impacted during the 2018 fire season.

### General Accomplishments Table

Number of BLM Visitors	BLM & USFS Education Participants	BLM & USFS Program Participants	BLM & USFS Visitor Contacts	Hours of BLM & USFS Volunteers	BLM Grazing Animal Unit Months	USFS Animal Unit Months
113,243	303	988	1440	3888	342	2,094

### Education, Outreach, and Interpretation

BSMNM offers exceptional wildlife viewing and hiking opportunities. In January and February, volunteers and biologists hosted guided hikes to view bald eagles soaring over the cliffs that overlook Cache Creek. This annual tradition provides participants with an opportunity to share in some of the natural wonders that this monument was established to protect. These hikes were provided in cooperation with the California



Department of Fish and Wildlife.

Several other outdoor excursions were hosted by non-profit partners throughout the year. These organized excursions provided opportunities to learn about BSMNM resources, while providing a safe and ecologically friendly experience. Partners provided wildlife presentations, a navigation course, presentations about leave no trace ethics, and guided hikes. In some cases, recreational gear and transportation to the trailhead were also provided by dedicated partner groups. Special thanks go to the non-profit partners at Tuleyome, the Hispanic Access Foundation, Sierra Club, Boy Scouts of America, and others for making these opportunities available.

*Figure 1. Burns Valley Elementary School Trip. Photo by B. Grabbert, Tuleyome.*



Fourth and fifth grade students from the Lower Lake and Burns Valley elementary schools participated in an interactive field trip to the Cache Creek Natural Area. A partnership with BLM, Tuleyome, USFS, California Department of Fish and Wildlife provided students with educational activities and a hike in the Cache Creek Wilderness. Four educational stations provided information and activities related to cultural resources, native plants, fire ecology, and wildlife habitat.

University of California at Davis professor Dr. Randy Hass brought his undergraduate field methods class to a prehistoric village in the Cache Creek Natural Area to teach students site mapping skills. BLM presented a brief prehistoric overview of the region and described some of the skills that are useful for a career in archaeology. Over the course of the day, students learned how to map a site using pace and compass, a sub-meter EMLID (open-source) Real-time Kinematic (RTK) GPS unit, and a survey grade laser transit. Students produced a high precision map of this site and learned new skills.

*Figure 2. University of California undergraduate archaeology class in the Cache Creek Natural Area. Photo by C. Lloyd, BLM.*



Information about the monument was provided at several outreach venues. At the Ukiah High School Earth Day festivities, students

learned about natural resources and public lands. Information and activities were also provided at the Earth Day festival hosted by Habematolel Pomo in Upper Lake.

BSMNM information was provided at county fairs, at the USFS booth for Upper Lake

Wild West Days, and at a BLM booth for Visions of the Wild, an event that was hosted in celebration of the Wild and Scenic Rivers Act 50<sup>th</sup> anniversary.



*Figure 3. Habematolel Pomo of Upper Lake Earth Day. Photo by R. Wong, BLM/USFS.*

### **Fish and Wildlife**

BSMNM works closely with state, federal, and nonprofit organizations to manage wildlife habitats and support

educational programming. Partnerships with the Pepperwood Preserve, Rocky Mountain Elk Foundation, University of California at Davis, EcoAdapt, Tuleyome and others support the planning and management goals for BSMNM.

Pepperwood Preserve prepared a wildlife habitat connectivity analysis within the Indian Valley Management Area. This project mapped and analyzed wildlife movement corridors with respect to a changing climate and habitat permeability. Information from this project will help inform partners, adjacent landowners and land management agencies.





*Figure 4. Tule Elk in the Cache Creek Wilderness. Photo by R. Wong, BLM/USFS.*

Tule Elk habitat was monitored in Cache Creek Natural Area, Western Pond Turtle was monitored in the Knoxville management area, and yellow legged frog populations were monitored in various locations.

Three rainwater catchments were repaired or installed, and burned infrastructure was removed from the Cache Creek Natural Area. Weed control treatments were also implemented to enhance elk habitat. Habitat monitoring for Keck's checkerbloom, an endangered plant, was also conducted within the Knoxville management area.

Riparian Proper Functioning Condition (PFC) survey work began in 2018. The BLM Ukiah Field Office hosted a training class in preparation for surveys at Harley Gulch, Wolf Creek, Cedar Creek, Hole Creek, Hunting Creek, Quartz Creek, Bartlett Springs, Bear Creek, North Fork Cache Creek, Indian Creek, and Perkins Creek. Post-fire photo point monitoring was also conducted at Wolf Creek.

## **Grazing**

Grazing within the monument continues in accordance with BLM and USFS permitting processes. BLM issued four grazing bills in 2018 and conducted postfire assessments of three allotments. The Jericho Valley grazing operator filed for non-use due to poor forage quality conditions that resulted from poor spring rains and fire impacts. Fires in 2018 have also impacted range conditions for other allotments located on BLM and USFS managed lands. Federal agencies are working with grazing permittees to allow for rangeland recovery of these impacted areas.



## Grazing Allotments within Berryessa Snow Mountain National Monument

Allotment Name	Acres within BSMNM	Federal Management Unit
Rocky Ridge	1,492	BLM Ukiah Field Office
Jericho Valley	4,433	BLM Ukiah Field Office
Maxwell Creek	466	BLM Ukiah Field Office
Cement Creek	1,695	BLM Ukiah Field Office
Salt Lick Canyon	85	BLM Ukiah Field Office
Elk Mountain	8,269	USFS Upper Lake District Office
Middle Creek	7,990	USFS Upper Lake District Office
Open Ridge	15,116	USFS Upper Lake & Grindstone District Office
Snow Mountain	20,973	USFS Upper Lake & Grindstone District Office
Little Stony	6,560	USFS Upper Lake & Grindstone District Office
Anderson Ridge	19,496	USFS Upper Lake & Grindstone District Office

### Partnerships

BSMNM worked to strengthen partnerships through educational and recreational opportunities with more than forty groups. Partnership efforts in 2018 focused on public outreach, supporting career development opportunities for youth, and fostering healthy habitat.

*Figure 5. Latino Conservation Week activities at the "Bajo las Estrellas" event. Photo by B. Grabbert, Tuleyome.*



### Public outreach

efforts for BSMNM were provided through several partnerships. Tuleyome and the Hispanic Access Foundation teamed up to coordinate a celebration of the Wild and

Scenic Rivers Act 50<sup>th</sup> Anniversary. This event was a highlight of the Latino Conservation Week activities for BSMNM. This “Bajo las Estrellas” event began with a bilingual Leave No Trace workshop. Local businesses provided food to our partner organizations, and a family style dinner was prepared by participants. Sierra Club and commercial donors provided camping gear for youth who were new to this type of activity, and all ate smores by the campfire. As the night grew dark, volunteer astronomers from Tuleyome, U.C. Davis, and the Ukiah Observatory set up telescopes to talk about quantum physics, galaxies, planets, constellations, and much more.



*Figure 6. Rafting down Cache Creek during Tuleyome's Wild and Scenic Rivers Act 50th Anniversary event. Photo by F. Torres-Toledo, Hispanic Access Foundation.*

After a hearty breakfast and an opportunity to visit with horseback riders at Cowboy Camp, 44 people joined our partners for a rafting trip to celebrate the Wild and Scenic Rivers Act 50<sup>th</sup> anniversary. Cache Creek is a popular attraction for class I to class III rapids, and river running provides a unique perspective for understanding the unique geology that forms BSMNM. For many youth, this was a new experience. The calm waters allowed participants to appreciate geological formations and the rushing white water posed an exciting challenge for all. The day ended with a BBQ, Junior Ranger Certification, and a welcome thanks to the partners who coordinated and sponsored this event.

BSMNM supported career development opportunities for youth in several ways. BSMNM offered on-the-job experience to a crew of 15 Student Conservation Foundation (SCA) youth to treat invasive weeds on USFS lands and utilized interns from Mobilize Green and the Water Resources Institute to conduct aquatic wildlife surveys. BLM provided on the job training for archeological monitors from the Elem Indian Colony Pomo in the Cache Creek Wilderness. BSMNM also provided career

development and resource management training to interns from Puerto Rico, California, Illinois, Florida, and Texas. All interns received professional training and on-the-job experience working with agency staff. In addition to safety, first aid, and project specific coursework, some interns also attended classes to build their career skills for firefighting and team leadership. A Resource Assistant Fellow was recruited through an agreement with the USFS and the Hispanic Access Foundation. This agreement provided a second, full time staff member to coordinate public outreach efforts, and support resource survey projects. Four interns were recruited by the BLM from the American Conservation Experience (ACE) for 12 weeks each, to assist BLM with resource surveys. They conducted a Visual Resource Inventory and helped with a Proper Functioning Condition survey of riparian habitats. Interns also worked on informational signs and the development of public outreach products.



*Figure 7. BSMNM interns in training to conduct Visual Resource Inventory surveys. Photo by B. Hare, BLM.*

BSMNM worked with several partners to foster healthy wildlife habitat on public lands. Continued cooperation with the California Department of Fish and Wildlife enabled BSMNM to offer

educational programs to underserved communities and provide public access to wilderness areas. BLM continued to work with the Rocky Mountain Elk Foundation to maintain water sources for wildlife and enhance public access to monument lands. Volunteers from the Rocky Mountain Elk Foundation replaced rotted beams on the Indian Creek Bridge and constructed a handrail to make it safe and accessible for pedestrian and equestrian use. Though only intended for pedestrian use, a few months later this bridge became an invaluable tool for transporting firefighters and equipment to contain the Pawnee Fire. The Indian Creek Bridge will need further repairs from transporting such heavy equipment, but it remains intact, as does the habitat to which it provides access.

BLM worked with California Department of Fish and Wildlife, Sherwood Valley Rancheria and California Indian Environmental Alliance to identify locations along Cache Creek for electro-fishing and the collection of fish tissue samples. The purpose



of this study is to quantify the toxicology levels in fish species that are important to traditional Pomo and Patwin lifeways.

The USFS Pacific Southwest Region and BLM California have partnered with EcoAdapt to conduct a vulnerability assessment and produce adaptation strategies for focal species in northwestern California. The assessment area includes public lands within the Six Rivers, Klamath, Shasta-Trinity, and Mendocino National Forests as well as BLM lands in the Arcata, Redding, and Ukiah field office areas. The assessment includes lands within BSMNM. During fiscal year 2018, Eco-Adapt hosted a community meeting where local resource specialists were gathered to provide input on important resources within BSMNM. Working groups compiled knowledge of local resources, species vulnerabilities, and potential management techniques to proactively mitigate some of these vulnerabilities. The draft report is being compiled and will be available for specialist review in 2019.

The Blue Ridge-Berryessa Partnership is a network of private landowners, public agencies, non-profit organizations, and the public that promote and support voluntary land conservation opportunities within the Blue Ridge-Berryessa Natural Area. The Blue Ridge-Berryessa Natural Area encompasses over 785,000 acres of land within the upper Putah and Cache Creek watershed. BSMNM is included in this area. A meeting was held in February 2018 to discuss the partnership's vision, potential opportunities and challenges.

*Figure 8. View of the Cache Creek Wilderness from an overlook along the Cache Creek Ridge Trail. Photo by R. Wong.*



## Recreation and Visitor Services

BSMNM includes a diverse landscape and numerous recreational opportunities. Park Ranger observations of visitor use on BLM lands in 2018 identified hiking, camping, OHV, hunting, equestrian, picnicking, target shooting, and fishing as the most popular activities in BSMNM. The monument does not operate a dedicated visitor center but instead provides maps and information about BSMNM at the BLM Ukiah Field Office as well as the USFS Upper Lake Ranger District, USFS Covelo Ranger District, and

## USFS Grindstone Ranger District of Mendocino National Forest.

Some of the most popular recreational areas are listed here.

- **Cache Creek Natural Area** provides access to the Cache Creek Wilderness and adjacent areas within BSMNM. Hiking trails include the Redbud Trail (7 miles), Judge Davis Trail (5.5 miles), the Perkins Creek Ridge Trail (5 miles), Blue Ridge Trail (8.5 miles), Fiske Creek Trail (4 miles), and Frogpond Trail (5 miles). Hiking, horseback riding, rafting, picnicking, wildlife viewing and hunting are popular here. Cache Creek is home to a free roaming herd of tule elk that can be seen seeking out water and shade at Cache Creek in summer. Bald eagles nest in this area during the winter. Guided hikes are offered to view these seasonal animals.
- **Indian Valley and Walker Ridge** are both located in the eastern portion of Lake County, just north of Hwy 20. Indian Valley Reservoir and Blue Oaks campground provide public recreational opportunities for fishing, boating, camping, and other day uses. Walker Ridge Road traverses the top of Walker Ridge, and offers views of the reservoir and surrounding areas. This graded gravel road provides access to the reservoir and to monument lands within Mendocino National Forest.
- **Cedar Roughs Wilderness** offers hiking, hunting, primitive camping, and wildlife viewing.
- **Knoxville** consists of 17,700 acres of steep rolling hills, with the vegetation ranging from scattered hardwoods and grasses to dense chaparral brush. The protected serpentine barrens in this area allow for unique plant communities that are found nowhere else. OHV riding, camping, swimming, and hunting are popular here. The North Staging Area provides bathrooms and parking for recreationists. Hunting Creek campground offers bathrooms, parking and camping.
- **Mendocino National Forest** offers exceptional mountain overlooks, forested hikes, rivers, wildlife habitat, trails and camping. Developed campsites with bathrooms and parking are available at Deer Valley Campground and Lakeview Camping Area.

- **Snow Mountain Wilderness** offers exceptional hiking and equestrian opportunities within Mendocino National Forest. Overnight camping may be found at the Lower Nye, West Crocket, Summit Springs, and Bear Creek campgrounds. A network of trails provides access to stunning views, forested areas, waterfalls, and recreational opportunities.



*Figure 9. Blue Ridge Trail in the Cache Creek Wilderness. Photo by R. Wong, BLM/USFS.*

This year, the BLM issued Special Recreation Permits for two equestrian events within the Cache Creek Natural Area. Equestrian routes for the Cache Creek Ridge Ride, and North

American Trail Ride Conference overlooked a wilderness area within BSMNM. Permits were also issued for commercial services provided by Cache Canyon River Trips, White Water Adventure, and KIKA Worldwide Outfitters. Letters of agreement were also provided for activities hosted by Nueva Vida, Tuleyome, and Boy Scout Troup 216. An inventory and condition survey of all travel routes within BSMNM was also contracted in 2018. Fieldwork has begun to document the condition of existing routes, and also consolidate data provided by several partner organizations. This inventory will continue in 2019. It will provide information needed to better manage recreation resources and update public outreach materials.

## Volunteers

BSMNM was formed in response to public support from recreational clubs, environmental groups, researchers, local businesses and community members. Volunteers contributions were recorded at 3,888 hours toward public lands projects within the monument. This includes hours contributed by a hosted worker, academic institutions, recreational user groups, environmental and community organizations. Tuleyome, Hispanic Access Foundation, Rocky Mountain Elk Foundation, Sonoma State University, California Four Wheel Drive Association, Mendocino 4X4 Club, Backcountry Horsemen of America, and many others contributed volunteer support in



2018. Without their support, many of the accomplishments listed throughout this report would not be possible.



This year, Tuleyome provided guided hikes, presentations, camping trips, successfully coordinated elementary school trips, and conducted public outreach. The Hispanic Access Foundation offered career

*Figure 10. Volunteers who worked on the Indian Creek Bridge. Photo by R. Wong, BLM/USFS.*

development opportunities that included hosting an employee at the BSMNM offices to work with partnership development, resource data collection, and educational outreach. The Rocky Mountain Elk Foundation's work on the Indian Creek Bridge enhanced public access to monument lands. Sonoma State University archeology program provided student volunteers to survey cultural resources. California Four Wheel Drive Association and the Mendocino 4X4 Club provided public outreach and presented at monument workshops. Backcountry Horsemen of California volunteers from the Lake/Mendocino Unit worked with monument staff to enhance recreational infrastructure for equestrian use at a popular BLM access route into the monument.

Public meetings in 2016 and 2017 provided insight regarding current land uses within the monument. Recreation was a recurring topic of discussion at those meetings. In 2018, BLM hosted Recreation, Volunteerism & Stewardship Workshops, funded by the Department of the Interior's Collaboration, Action, and Dispute Resolution (CADR) program. Workshops were hosted in Napa and in Upper Lake to provide an opportunity for representatives from land management agencies and different recreational groups to work together and learn from each other.

A facilitator conducted preliminary interviews with several agency staff and partners who have been active in the establishment of and support for BSMNM. The sum of these interviews formed a basis for the workshop format. During this process, USFS and BLM developed a list of potential partners. BSMNM also outreached to the public via website, radio, and by posting fliers at local businesses. Workshop presentations were provided by agency staff from the BLM and USFS, explaining agency procedures,

benefits of volunteer service, and its limitations. Local groups presented their success stories about youth engagement, invasive plant abatement, sign installation, and other collaborative project successes. Presentations were then followed by facilitated discussions. Group activities and discussions were designed to identify potential alignments and opportunities for nonprofit groups and federal agencies.



*Figure 11. Recreation, Volunteerism, & Stewardship Workshop at Upper Lake. Photo by R. Wong, BLM/USFS.*

Representatives from 18 partner organizations participated in the Recreation, Volunteerism and Stewardship Workshops. They discussed several ways that community members can contribute to the success of this new monument. Workshop participants identified a need for sustained partnership building, and recommended increasing the Monument's visibility through brochures, signing, websites, and other interpretive publications. Federal agencies learned that there is minimal conflict between the current user groups and a willingness for them to work together. Several participants offered professional skill sets and expressed a willingness to contribute. Workshop participants also acknowledged that BSMNM has resource and staff capacity challenges. OHV clubs are already engaged in trail clearing, volunteer outings, post storm and fire clean-up. Environmental and friends groups continue to host outdoor excursions and educational opportunities. Partner organizations who are able to lead BSMNM events and conservation education programs always welcome, as are those groups who are willing to submit grant applications and manage the funding needed to realize shared monument goals. Participants provided valuable recommendations at the Recreation, Volunteerism and Stewardship Workshops. BSMNM implemented the first of these suggestions by hosting a National Conservation Lands Day volunteer cleanup event at Hunting Creek Campground. BSMNM will implement more of these recommendations in 2019.

### **Wildland Fire:**

Public outreach efforts and fire preparedness within the Wildland Urban Interface continued to be high priorities in 2018. BLM outreached to several local communities

and USFS fuel treatment efforts continued within the Lakeview and High Valley areas. USFS conducted approximately 120 acres of understory burning, 638 acres of pile burning, 320 acres of commercial thinning, 398 acres of thinning, pruning and piling of small diameter trees, plus 372 acres of small diameter mastication within these two project areas between 2009 and 2018. USFS also continued to partner with FireScope Mendocino to engage with stakeholders, in support of fire safe communities.

Approximately 184,460 acres (56%) of BSMNM was within the wildfire burn perimeter for multiple fires in 2018. The Mendocino Complex (Ranch Fire), Pawnee Fire, County Fire, Snell Fire, and Cache Fire impacted approximately 147,005 acres of USFS managed lands and 37,455 acres of BLM managed lands within BSMNM. Temporary closures were implemented during fire suppression activities at Indian Valley and Walker Ridge, Cache Creek, and Knoxville. A temporary closure was also implemented during fire suppression and rehabilitation activities for some BSMNM lands managed by Mendocino National Forest.

The Mendocino Complex fires burned a record number of acres and had a devastating effect on local communities. Throughout the 2018 fire season, federal land managers worked together with CalFire, Native American tribal governments, state, county, and local community leaders, and with the individuals who were most closely affected by these events. Burned Area Emergency Response (BAER) teams were recruited to assess damages to public lands from the Ranch, River, and Pawnee Fires. Fuels treatment effectiveness monitoring was conducted on all USFS fuels treatments that the 2018 Ranch Fire burned through to identify any lessons learned from this fire season. BAER reports characterized fire impacts and recommended emergency stabilization and rehabilitation actions. Implementing the recommendations from these assessments will be a priority in 2019.

More information is available at <https://www.blm.gov/programs/fire-and-aviation/regional-information/california/mendocino-complex-fires> and at <https://inciweb.nwcg.gov/incident/6073/>



*Figure 12. Firefighter on Pinnacle Rock overlooking lands burned in the Ranch Fire. Photo by R. Wong. BLM/USFS.*



# 3 Science

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## Science

The monument does not have a science plan, but has been collecting baseline data to inform ongoing management and future planning efforts. Several partners have expressed support for development of a science plan and a willingness to participate in this type of planning effort. In the meantime, several partner-driven research projects have been customized to include assessment and management tools. These tools are designed to assist land managers with daily challenges associated with protecting the resources, objects, and values of BSMNM.

### **Diversity, Dynamics, and Distribution of Fire-Following Plant Species**

Nomad Ecology LLC., in collaboration with Pepperwood's Dwight Center for Conservation Science was awarded a grant from the BLM National Landscape Conservation System Research Support Grant for a study of Diversity, Dynamics, and Distribution of Fire-Following Plant Species in the North Coast Range chaparral within BSMNM. This study aimed to provide data for post-fire chaparral floras. By collecting baseline ecological data, explaining biotic and abiotic drivers, and identifying potential risks to rare species, the study identified overarching ecosystem patterns that can inform ecologically driven land management actions within BSMNM. Despite the abundance of chaparral in this part of the state most post-fire chaparral research has focused on southern California. While this study primarily is intended to support the management goals of the BSMNM, it also expands the geographical range of post-fire research, defining a state-wide context for the unique ecological dynamics of BSMNM.

### **Vegetation Mapping and Analysis**

BLM partnered with the University of California at Davis Department of Environmental Science and Policy to obtain a grant from the National Conservation Lands Program. The grant was used to develop methods to digitize important historical surveys of BLM lands within the Berryessa Region and lands managed by Mendocino National Forest. Digitizing and geo-referencing Timber Stand and Soil Vegetation Survey (SVS) data from the 1940s was a top priority for this project. These baseline surveys were conducted systematically for the greater portion of California's Northwest Region. The SVS used several mapping approaches to delineate vegetation patterns across entire quadrangles. There was also an extensive field component, historically paid for with over \$4 million in funding from the state of California. U.C. Davis has leveraged the seed money for this project and recruited additional partners from the Natural Resource Conservation Service, California State Chico Library, and University of California at Berkley. This work is ongoing, but initial products are becoming available

now. Digitization of this information into GIS format provides a ready resource for resource specialists. When overlaid with fire history polygons and other resource data, researchers and land managers are better able to identify the dominant species before an area burned. This information aids land managers in selecting successful fire rehabilitation approaches. Data sets tendered through this project will be added to existing data maintained by federal land managers to provide a more comprehensive picture of resource dynamics. They provide context and a snapshot in time from approximately 60 years ago. These digital tools enhance our understanding of how environmental factors and lands management actions may have influenced vegetation and wildlife habitat within BSMNM.

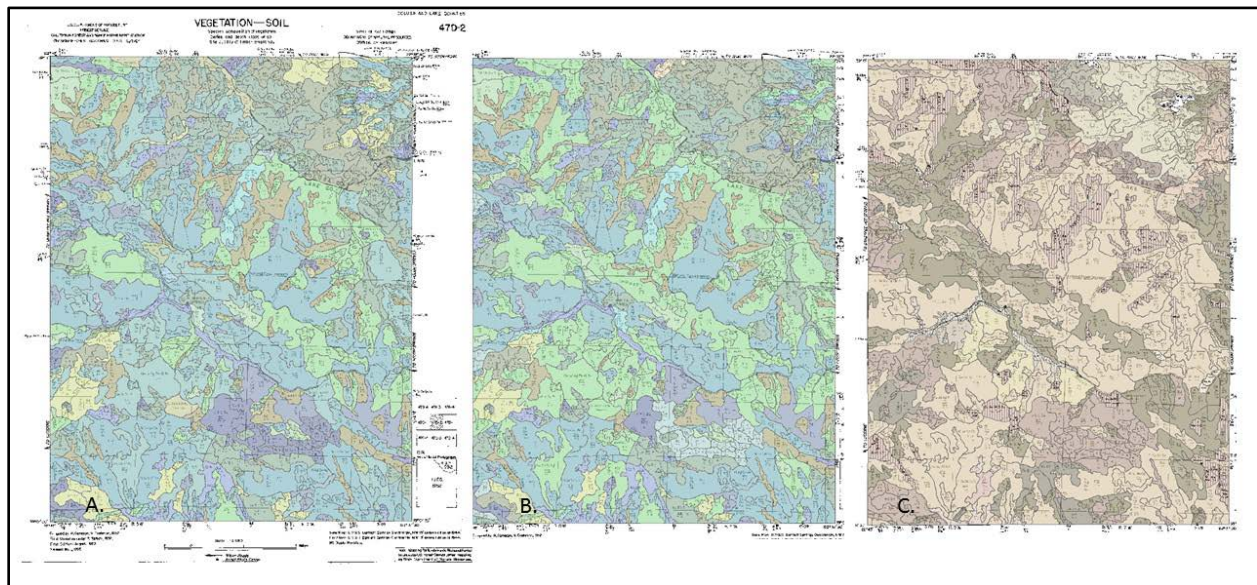


Figure 13. This five minute quadrangle map has been digitized to show the 1st dominant plant species (A), draft vegetation types (B) and soils (C). Image by James Thorn, PhD.

## Building Habitat Connectivity

BLM and Pepperwood Preserve partnered on a study to analyze wildlife habitat connectivity within the Indian Valley Management Area. The California Landscape Conservation Partnership provided funding for this study. The study utilized scientific data and local land management expertise to define a habitat corridor based on landscape linkages between the Indian Valley Areas of Critical Environmental Concern (ACECs). The study assessed potential climate adaptation approaches, quantified conservation benefits, identified critical land management partners, and articulated potential next steps. Parcel scale habitat corridor conservation strategies were identified to enhance these linkages. High resolution data products were created to illustrate options that would enhance riparian and terrestrial taxonomic groups. Analysis of ecological functionality and climatic trends may also identify fire safe refuges within this diverse landscape and other components useful for ensuring

sustainable wildlife populations. This process developed for this study is applicable to other areas of research interest within BSMNM and provide context for the larger region.

*Figure 14. Sonoma State University students at Cache Creek Natural Area. Photo by C. Lloyd, BLM.*

### **Cache Creek Cultural Resource Predictive Model**

BLM conducted a class III survey of the Cache Creek Natural in 2016 to document cultural resources after the Rocky Fire.

This was a one of several such events. Much of the area had never been surveyed because it was thick with 80+ year decadent stands of Chamise. Sonoma State University's Anthropological Studies Center entered into an agreement with BLM to develop a management tool for BSMNM. They developed a predictive model to identify Pleistocene landforms that may have traces of Paleo-Indian habitation and conducted ground truth exercise of this model during the 2018 field season. The predictive model used 12 variables to identify potential locations of Paleo-Indian use. To test the accuracy of this model, student volunteers conducted field surveys, and identified several sites that were previously unknown to the archeological community. This project helped to bring experienced archaeologists from Sonoma State University, Alta Archaeology, State Parks, and the BLM together with undergraduate and graduate students. Experienced archeologists used this opportunity to convey knowledge to the next generation and to promote potential thesis topics that will benefit future studies within BSMNM.



### **Cultural Resources Class I Overview**

A Class I overview of known cultural resources throughout BSMNM was completed this year. This overview picks-up where Docken and McCarthy et al. left off on their 1982 overview. Many studies have occurred within the Monument over the past 35



years and this report benefits from advances in technology. The prehistoric overview is a comprehensive assessment of the prehistoric lifeways of the Pomo and Patwin peoples. It synthesizes more than 300 studies and incorporates Geographic Information System (GIS) predictive modeling with crisp graphics to provide a comprehensive context and an associated management tool. Archeologists can now load a BSMNM ESRI Tile Package (TPK) onto a tablet to increase efficiency when conducting fieldwork.

# 4

## Resources, Objects, Values and Stressors

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Establishment of Berryessa Snow Mountain National Monument has provided an opportunity for the BLM and USFS to pool resources when appropriate and facilitate shared accomplishments on behalf of both agencies and partner groups. BLM and USFS follow the annual reporting procedures established by each of their respective agencies. Accomplishments for the entire monument are included in the preceding sections of this report. The heading of each table indicates which agency and what resources are represented in cases where management data collection methods differ from one agency to another.

### Cultural Legacies

This landscape and the resources within it retain deep cultural significance for many communities. Natural resources within BSMNM continue to support traditional lifeways of Native American communities, and traditional ecological knowledge contributes to our understanding and management of these lands.

Hundreds of cultural resource sites have been identified within the monument and only 14% of BSMNM has been surveyed. Despite the small percentage of archeological survey, prehistoric villages, seasonal camps, historic homestead cabins, and evidence of historic industries are known to dot this landscape. The Cache Creek National Register District alone contains 31 contributing prehistoric resources. This area is dense with sites from the middle to late Emergent Period. BSMNM also retains evidence of several Paleo-Indian sites dating to the Pleistocene - Holocene transition.

Historic-era sites include historic logging roads, abandoned mercury mines, and nineteenth century homesteads. Highlights include the Epperson Toll Road, traversing the BLM monument lands and was used to access Bartlett Springs during the late 1800s. Bartlett Springs is located on Forest Service Lands within the Monument. The

discreet terraces in riparian corridors on BLM lands were also a source of fodder and perennial water supply for nineteenth century grazing and farming. The historic Nye Cabin (1868) is part of an early ranching operation on USFS lands. The Knoxville area was heavily prospected and mined for a mercury bearing ore called cinnabar during the late 1800s. Walker Ridge was also heavily prospected especially during the mid-20<sup>th</sup> century for mercury-bearing ore. It appears that many of the prospects were unsuccessful but these abandoned sites have a history and some have the potential to pose health and safety concerns.

### Cultural Legacies Status and Trend Table (BLM)

Status of Resource, Object, or Value	Trend
Good condition = 59%, Fair condition = 30%, Poor condition = 11 %  Condition assessment ratings are influenced by site integrity and factors like vandalism, theft, and/or erosion.	Stable.  There has not been a substantial change in the recorded condition of cultural resources within the monument's BLM managed lands since its establishment in 2015.

### Cultural Legacies Inventory, Assessment and Monitoring Table (BLM & USFS)

Acres in Unit	Acres Inventoried	Number of Cultural Sites Identified	Acres Monitoring reported in FY
330,780	59,000	624	525

### Stressors Affecting Cultural Legacies

More than 300 cultural resource surveys have been sponsored by the BLM and USFS. Most cultural resource surveys are driven by project requirements to comply with section 106 of the National Historic Preservation Act. Thus, one stressor for responsible cultural resource management is a lack of monument-wide data to draw from. The most prominent stressors for cultural resource protection are off-highway vehicle impacts, erosion, some artifact collection, fire, and rodent burrowing. In the past the BLM has used barricades to indicate sensitive resource areas. Post-and-cable as well as two-ton boulders are strategically placed to lessen vehicular use in culturally sensitive locations. Raptor nesting platforms were installed near sites that were being impacted by rodent burrowing on BLM lands. Proactive measures were taken to protect the historic Myers and Nye Cabins on USFS lands during the Mendocino Complex Fires. Both cabins were wrapped in fire shelter fabric and combustible fuels within their vicinity were removed before wildland fires reached

them. Both of these National Register eligible structures remain intact.

Establishment of Berryessa Snow Mountain National Monument has provided an opportunity for the BLM and USFS to pool resources when appropriate and facilitate shared accomplishments on behalf of both agencies and partners. BLM and USFS follow the annual reporting procedures established by each of their respective agencies. Accomplishments for the entire monument are included in the preceding



sections of this report, but this section of the report specifically highlights objects, resources, values and stressors that are managed on BLM lands.

*Figure 155. Nye Cabin covered in fire shelter fabric to protect it from the approaching Ranch Fire. Photo by M. Dugas, USFS.*

## Soils & Geology

BSMNM exhibits stunning geologic features, unique habitats, and reveals a story of plate tectonics that engages visitors like no other. The steep mountains and valleys, shaped by numerous fault zones, supply endless views within this impressive landscape. Near vertical cuts expose stratigraphic layers and expose volcanic rocks that formed during the Great Valley and Franciscan Complex.

Caves and serpentine rich soils provide unique habitats that sustain a vast diversity of plants and animals. Soils formed from Serpentine rocks contain materials, such as chromium, cobalt and nickel, which are harmful to many plants. The combination of soils and specialized plants that rely on this habitat nurture a unique setting for research, education, and visitor enjoyment.

There are many facets to the management of soil and geological resources within BSMNM and not all of them are included in the tables below. The following table represents information about serpentine soils, because these unique soils, along with



the rare plants that are found in serpentine habitats, are a key component of habitat management on BLM lands.

### Soils & Geology Status and Trend Table (Serpentine Soils, BLM)

Status of Resource, Object, or Value	Trend
Fair  Serpentine soils are very sensitive to disturbance. Fire suppression activities, and recreational OHV use are sources of soil disturbance in serpentine soils.	Stable/Declining  Mostly stable, but declining in areas recently disturbed by fire suppression activities and non-authorized OHV use.

### Soils & Geology Inventory, Assessment and Monitoring Table (Serpentine Soils, BLM & USFS)

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
330,780	330,780	84,765	0

### Stressors Affecting Soils & Geology

Large areas of serpentine soils were impacted by firefighting activities during the Ranch and Pawnee fires. Soils were heavily impacted during suppression activities where the top layer of soil was scraped bare by bulldozers to create fire breaks. Approximately 14 miles of dozer lines were placed through serpentine soils, all within the Indian Valley area. Recovery of serpentine soils and the sensitive plant species that it supports will be slow to return within the burn perimeter, but there will be long term impacts in active suppression areas, needing additional support to recover.

Without adequate signing, serpentine soils have also been impacted by post-fire recreational vehicle traffic. In many areas, unauthorized trails have been created, causing topsoil loss and degradation to the plant communities that rely on serpentine soil habitats. Recreational use on non-



Figure 16. Fuel break on Walker Ridge. Photo by C. Lloyd, BLM.

authorized trails, especially within the Indian Valley area will continue to degrade serpentine soils until a travel management plan is created to manage the recreational use to conserve and protect serpentine soils.

## Water & Hydrological Resources

Eleven miles of riparian Proper Functioning Condition (PFC) assessments were conducted by BLM. This method of data collection provides a snapshot overview of the function and health of riparian areas. This process uses hydrology, vegetation, soil, and landform attributes to make this assessment. All 11 miles of riparian areas monitored were at PFC. However, monitoring was conducted prior to the County, Pawnee, and Ranch fires in 2018. Streams and creeks within the burned areas will need re-assessed during the restoration and rehabilitation efforts.

USFS upgraded degraded culverts along Trout Creek to improve water quality, aquatic habitat, and public safety in 2016. Interns resurveyed this stretch of stream in 2018 to see how the channel has changed over time. Student interns from Mobilize Green and Water Resource Institute assisted with these field surveys. Students determined that fish and frogs were present upstream of the new culvert and recorded evidence that the new culver design produced a more complex system that enhanced aquatic habitat.



*Figure 167. Mobilize Green and Water Resources Institute interns surveying aquatic habitat at Trout Creek. Photo by H. Kwan, USFS.*

## Water & Hydrology Status and Trend Table (BLM)

Status of Resource, Object, or Value	Trend
Fair/Poor	Stable/Declining

A temporary increase of sedimentation from burned areas, and abandoned mercury mines pose negative impacts to Cache Creek and Harley Gulch.	Impacts from fire burned landscapes will continue to temporarily degrade water quality but effects should dissipate within 5 years. Abandoned mine land reclamation efforts are ongoing.
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## Water, Hydrology, & Riparian Proper Function Condition (PFC) Assessments Table (PFC, BLM)

Acres in Unit	Miles Inventoried	Miles Possessing Object	Miles Monitored in FY
330,780	0	93 miles	11 miles

### Stressors Affecting Hydrological Resources

The main threats to ecological integrity of hydrologic resources include off-highway vehicle (OHV) recreation, increasingly frequent fires and increasing fire intensity, illicit marijuana cultivation, and water pollution from residual mine waste.

Hydrologic resources were heavily impacted by wildland fires within the national monument. Approximately 184,460 acres (56%) of BSMNM was within the wildand fire burn perimeter for multiple fires, including the Mendocino Complex, Pawnee, County, Snell, and Cache fires. Both agencies are implementing procedures to reduce sedimentation as much as possible. Burned culverts are being replaced and agencies are working with local governments and water boards to monitor runoff from the fires.

Several abandoned mercury mines are located on BLM lands that are not located within the BSMNM boundary. Some of these mines are located within watersheds that flow through monument lands. Abandoned mercury mines have been impacting Harley Gulch, Bear, Sulpher, and Cache Creek for over one hundred years, transporting and depositing mine waste. BLM is currently implementing remedial actions to reduce soil erosion and runoff and then will monitor to see if improve water quality returns to the BSMNM watersheds.

### Biodiversity & Research

The Knoxville management area is a hot-spot for serpentine endemic plants. The area is valued by botanical researcher due to the high presence of these sensitive plant species. Botanical surveys were conducted in 2018. This area continues to recover from the fires of 2015. BLM partner Pepperwood Preserve completed a study on fire-



following plant species within the burn perimeters of the 2015 fires. The report identified five rare plants and an overall total of 150 taxa within 2015 burn perimeters.

The Indian Valley management area, another hot-spot for serpentine endemic plants, sustained heavy damage from fire and suppression operations this year. The areas burned will likely recover naturally with little management intervention. The areas affected by suppression operations may require stabilization and rehabilitation due to the level of damage the ecosystem sustained. BLM plans to implement a similar study on fire-following plant species within the 2018 burn perimeters.

#### **Biodiversity & Research Status and Trend Table (BLM)**

Status of Resource, Object, or Value	Trend
Good/Fair	Stable
Serpentine soils are very sensitive to disturbance. Fire, fire suppression activities, and recreational OHV use were sources of soil disturbance.	Mostly stable, but has the potential to decline in recently disturbed areas and areas heavily impacted by fire and fire suppression.

#### **Biodiversity & Research Inventory, Assessment and Monitoring Table (BLM, endemic serpentine plant species)**

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored in FY
330,780	3,200	14,706	8,985

#### **Stressors Affecting Biodiversity & Research**

Threats to ecological integrity are similar to those for Water and Hydrologic resources with a few additional considerations. Non-native and invasive weeds also pose a threat to biodiversity. Invasive species pose an increasing threat to endemic plant species. Invasive weeds spread to new areas of BSMNM when seeds are carried by vehicles, recreational, and firefighting equipment. Some of the more invasive weed species do well in recently burned areas and outcompete native plant species.

BSMNM is visited by thousands of people every year and some of those visitors inadvertently impact fragile serpentine ecosystems and other resources that BSMNM is mandated to protect. Undesignated routes and unauthorized OHV use impact sensitive serpentine ecosystems. The serpentine ecosystems are slow to recover because they have limited soil nutrient levels. These fragile ecosystems may not

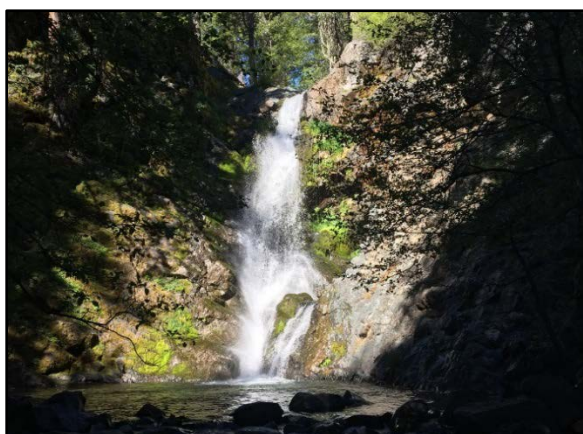
recover properly without implementing post-fire restoration work. This management challenge will likely increase now that fires have removed brushy vegetation and fire suppression efforts have bladed new swaths of land to create fire breaks and temporary access routes.

# 5

## Summary of Performance Measure

Most of the resources, objects and values within Berryessa Snow Mountain National Monument are stable. However, recent fire events have had an effect on monument management. Several resources are currently experiencing a temporary decline as soils and plant communities recover from this year's fire events.

Resources, Objects, and Values BLM Status Summary Table		
Resource, Object, or Value	Status	Trend
Cultural Legacies	Good condition = 59%, Fair condition = 30%, Poor condition = 11%	Stable
Soils & Geology	Fair	Stable/Declining
Water & Hydrological Resources	Fair/Poor	Stable/Declining
Biodiversity & Research	Good/Fair	Stable



*Figure 178. Waterfall near the West Crocket Trail in the Snow Mountain Wilderness.  
Photo by R. Wong, BLM/USFS.*

# 6 Manager's Letter

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More than forty groups expressed their interest in Berryessa Snow Mountain National Monument this past year by attending workshops and meetings, and contacting me directly. Volunteers attended federal training programs, and partner groups worked together to coordinate some exceptional public programs. Others provided candid observations, provided resource data, and even helped to conduct resource surveys. Each group contributed their time and effort in support of the resources and the opportunities that they value most within the monument.

This report only touches on the highlights from 2018, but it shows some of our combined successes. Each volunteer, partner organization, club, agency, and staff member deserves credit for the combined accomplishments in this report.

Reviewing our work from 2018 reminds me how much we can accomplish when we identify shared goals and work together. This will be important in 2019 as fire recovery efforts continue. It will also be important as BSMNM begins to implement recommendations identified in the 2018 workshops. We appreciate the strong volunteer support that our recreational user groups have already offered.

BSMNM hopes these organizations and volunteers continue to work with BLM and the USFS and share your insights as BSMNM begin to compile and digest the data gathered this past year and work with interdisciplinary resource specialists to ensure that these lands and resources are well cared for in the future.

I feel so fortunate to be a part of the Berryessa Snow Mountain National Monument team. I look forward to another successful year in 2019.

Sincerely,

*Rebecca Carr Wong*

Rebecca Carr Wong  
National Monument Manager



# Berryessa Snow Mountain

## National Monument



**NATIONAL  
CONSERVATION  
LANDS**



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February 27, 2019

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