NATIONAL CONSERVATION LANDS

Oregon

Cascade-Siskiyou

National Monument

Annual Manager's Report—Fiscal Year 2016

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Designating Authority

Designating Authority: Presidential Proclamation 7318 – Establishment of the Cascade-Siskiyou National Monument

Date of Designation: June 9, 2000

The Omnibus Public Lands Management Act of 2009 (Public Law 111-11) designated approximately 24,155 acres in the southern portion of the Monument as the Soda Mountain Wilderness (SMW). The Bureau of Land Management (BLM) acquired two privately-owned inholdings in the wilderness in 2012 (552 acres). The SMW is now entirely in BLM-administered federal ownership.

Acreage

Total Acres in Unit	85,141
BLM Acres	65,341
Other Federal Acres	48
State Acres	0
Private Acres	19,752

The Cascade-Siskiyou National Monument (CSNM) is located in southwestern Oregon. The presidential proclamation reserved the CSNM in recognition of its remarkable ecology and to protect a diverse range of biological, geological, aquatic, archeological, and historic objects. The resources found in the monument, both individually and collectively, comprise a unique and diverse ecosystem.

The richness of the plant community is due to the monument's geographical location at the intersection of the Cascade, Klamath and Eastern Cascade Slopes Ecoregions. Evolution, long-term climatic change, and geological processes (volcanism, mass wasting, erosion, etc.) operating across geological time contribute to the high ecological richness of the area.

The monument incorporates other overlapping ecological designations including: Scotch Creek Research Natural Area (RNA), Oregon Gulch RNA, Mariposa Lily Botanical Area, Jenny Creek Tier 1 Key Watershed (in Oregon), and the Soda Mountain Wilderness.

Located in the northwest corner of the Cascade-Siskiyou National Monument, the 745-acre Hyatt Lake Recreation Area provides opportunities for camping, hiking, fishing, and boating. It is the only developed recreation area within the CSNM. The recreation area includes three developed campgrounds, one primitive campground, and several day use areas.

Contact Information

Unit Manager	Kristi Mastrofini, Field Manager/Monument Manager
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Field Office Name	Ashland Resource Area
District Office Name	Medford
State Office Name	Oregon/Washington

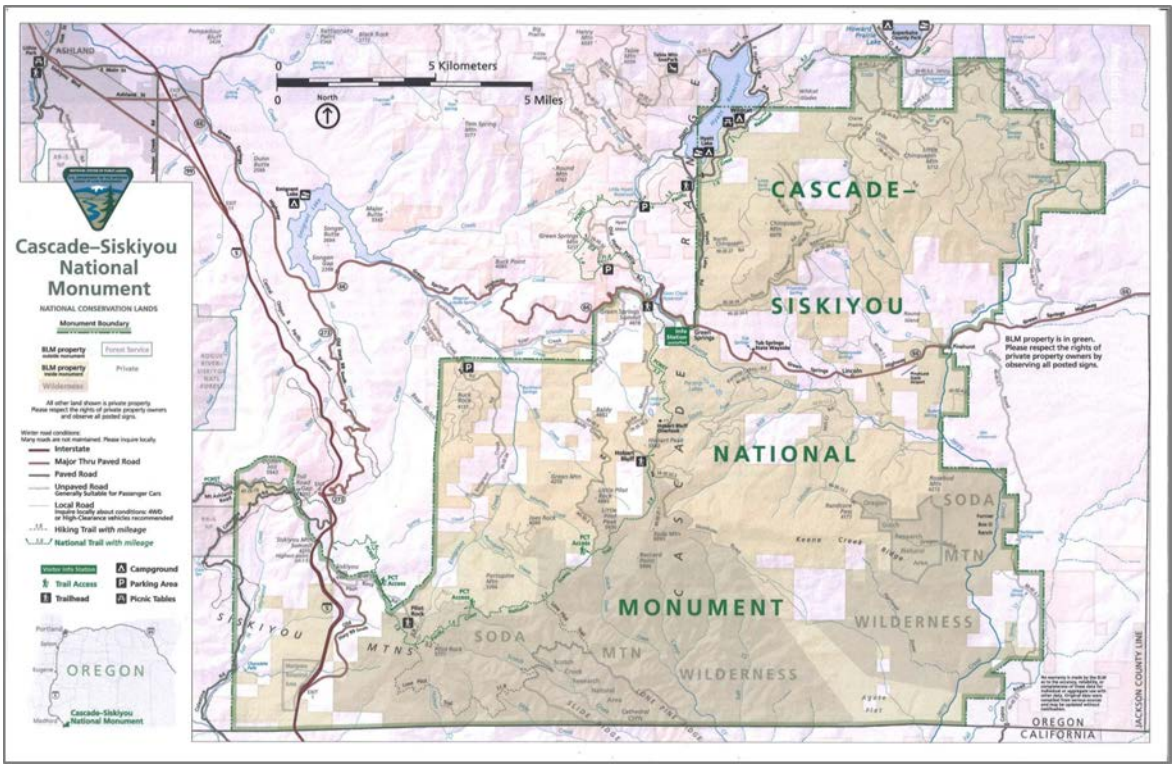
Budget

Total Fiscal Year 2016 Budget	$888,000
Subactivity 1711	$218,000
Other Subactivities' Contributions	$670,000
Other Funding	$0

Visitation

The CSNM had approximately 134,141 visitors in FY 2016.

Map of Cascade-Siskiyou National Monument



Managing Partners

N/A

Staffing

The CSNM is administratively located within the Ashland Resource Area of the Medford District. Many of the staff positions that assist the monument are Ashland Resource Area resource specialists whose primary duties are located outside of the monument.

The Monument Manager role is filled by the Field Manager. Kristi Mastrofini was hired in April 2016 as the Field/Monument Manager. The Assistant Monument Manager, Joel Brumm, has operational leadership duties for the monument, supervises monument staff, and manages the monument budget. The Ashland Field Manager reports to the Medford District Manager and is the line officer responsible for decision-making in the CSNM.

View of Scotch Creek RNA in the Soda Mountain Wilderness

The CSNM has three dedicated full-time staff positions: a Monument Planner, an Ecologist, and an Interpretive Specialist. The Assistant Monument Manager and Outdoor Recreation Planner spend the majority of their time on the monument, but have other competing duties. The relevant sub-activities (1210, 1711, 6711) fund portions of the resource area and support staff that contribute to accomplishing the work in the CSNM. In FY 2016, the Ecologist position was vacant all year, and the Monument Planner position was vacant for six months. The Ecologist position was filled just before the end of the FY, but the candidate was not set to enter on duty until FY 2017. The GS-7 Park Ranger was filled in October of 2015, and the Interpretive Specialist was filled in late December 2015.

The following table summarizes the positions and funded percentage of time allotted to duties in the CSNM:

Position	Series/Grade	Full Time/Seasonal	% Time Dedicated
Monument Manager (Field Manager)	GS-0340-13	Full Time	10
Assistant Monument Manager	GS-0401-12	Full Time	80
Natural Resource Specialist (Monument Planner)	GS-0401-11	Full Time	100
Interpretive Specialist	GS-1001-11	Full Time	100
Outdoor Recreation Planner	GS-0023-11	Full Time	75
Park Ranger (Hyatt Lake)	GS-0025-07	Full Time	100
Ecologist	GS-0408-11	Full Time	100
Botanist	GS-0401-11	Full Time	10
Administrative Technician	GS-0303-07	Full Time	10
Hydrologist	GS-1315-09	Full Time	20
Park Rangers (2)	GS-0025-03	Seasonal	100

2 Planning and NEPA

Status of the Resource Management Plan

The Cascade-Siskiyou National Monument Resource Management Plan and Record of Decision (CSNM RMP/ROD) was approved in August 2008. It provides guidance and direction for a strategy aimed at protecting and enhancing the public lands and associated resources within the CSNM. The planning process for the CSNM addressed issues of public interest including vegetation management, transportation and access, livestock grazing, and recreation.

The Omnibus Public Lands Management Act of 2009, Public Law No. 111-11, provided for two land exchanges "for the purpose of protecting and consolidating Federal land within the monument," where the public land involved in these two exchanges is located within the CSNM. These congressionally-directed land exchanges brought to light differences between the CSNM RMP and the Presidential Proclamation in regard to land exchanges.

Presidential Proclamation 7318, which designated the CSNM, allows for "exchange that furthers the protective purposes of the monument." Land tenure decisions in the CSNM RMP limited land exchanges in the monument by requiring that the public land involved in the exchange be located outside the CSNM. The RMP was more restrictive than the proclamation by precluding exchanges that further "the protective purposes of the monument" where the public land involved is located within the CSNM.

The RMP was amended in 2013 to allow the BLM to consider, in subsequent NEPA analysis, land exchanges where the federal land to be exchanged is located within the CSNM, including the two exchanges authorized by the Omnibus Public Land Management Act of 2009. Lands may now be acquired by exchange where the public land involved in the exchange is located outside the CSNM or where the public land involved is located within the boundaries of the CSNM, as long as in either case the exchange "furthers the protective purposes of the monument."

Status of Activity Plans

Soda Mountain Wilderness Final Stewardship Plan

The *Soda Mountain Wilderness Final Stewardship Plan* was approved in April 2012. The plan focused on enhancing wilderness character through a combination of actions that includes active and passive restoration as well as providing opportunities for solitude and primitive recreation, including some roads-to-trails conversions.

Cascade-Siskiyou National Monument Transportation Management Plan

Legacy Transportation Route

A Notice of Appeal of the CSNM ROD/RMP was filed in September 2008 with the Interior Board of Land Appeals (IBLA). As part of the 2008 settlement agreement on this appeal, the BLM initiated transportation management planning in 2009. The Draft Transportation Management Plan/Environmental Assessment (TMP) was released for public comment on March 25, 2016. A summary of the alternatives considered follows: There are 412 miles of inventoried road on both private and public lands within the planning area (the CSNM excluding the SMW). This includes highways, county, BLM controlled and privately controlled roads.

The draft TMP identifies four alternatives:

Alternative 1 - (No Action Alternative)

Alternative 1 would implement the current approved road treatments in the approved 2008 RMP and establish a baseline to evaluate the other alternatives.

- Approximately 113 miles of road would be designated as open.
- This alternative would decommission or close 11.47 miles of road, of which 6.52 miles (57%) are overgrown and/or closed roads not accessible to the public.
- Alternative 1 does not propose any restoration or closure of the roads within the 12,288 acres of newly acquired lands or the roads the BLM agreed to evaluate in the IBLA negotiated settlement (ROD/RMP Maps 22 and 23).
- Snowmobiles could use designated open roads north of Highway 66 and the snowmobile routes identified on Map 25 (ROD/RMP Map), even where the routes are located on “closed” or “BLM and authorized use” roads.

Alternative 2

The objective of Alternative 2 is to balance access needs with the ecological restoration identified in the approved 2008 RMP. This alternative would implement a targeted reduction of road densities, while maintaining access for private property owners, resource management, wildfire suppression, law enforcement, various recreational activities, administrative purposes, and access for federally recognized Native American Tribes.

- Approximately 82 miles of road would be designated as open.
- This alternative would decommission or close 164.19 miles of road, of which 63.82 miles (39%) are overgrown and/or closed roads not accessible to the public.
- Snowmobiles for recreational use would not be allowed in the CSNM under this alternative.

Alternative 3

This alternative would implement a targeted reduction of road densities, while providing a higher level of access than Alternative 2 for wildfire suppression, recreational activities and other administrative uses.

- Approximately 90 miles of road would be designated as open.
- This alternative would decommission or close 150 miles of road, of which 59.39 miles (40%) are overgrown and/or close roads not accessible to the public.
- Snowmobiles would be allowed on designated open roads north of Highway 66 and on the winter multi-use routes identified on Map 2-5 in the EA.
- This alternative would convert an existing closed road system to a designated 4.95-mile loop trail off of Emigrant Creek Road (39-2E-34) to Buck Rock Tunnel, a popular hiking destination.

Buck Rock Tunnel

Alternative 4

Alternative 4 implements the current approved road treatments in the approved 2008 RMP and would decommission roads identified in the IBLA settlement agreement (RMP Maps 22 and 23).

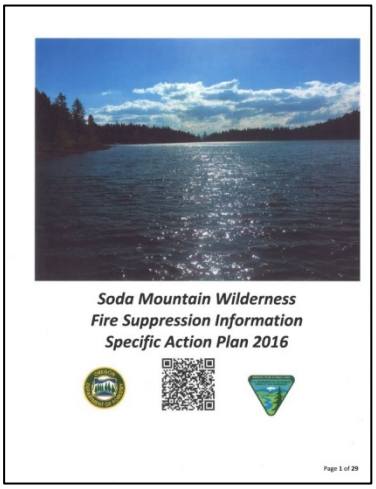
- Under this alternative approximately 114 miles of road would be designated as open.
- This alternative would decommission or close 22.31 miles of road, of which 11.78 miles are overgrown or not accessible to the public.
- Alternative 4 does not propose any restoration or closures of the roads within the 12,288 acres of newly acquired lands.
- Snowmobiles could use designated open roads north of Highway 66 and the snowmobile routes identified on Map 7 in the EA, even where the routes are located on otherwise "closed" or "BLM and authorized use" roads.

There has been substantial interest from the public and local elected officials in the CSNM draft TMP, and the comment period has been extended twice. The comment period closed on November 18, 2016, and analyses in light of comments received are proceeding.

Soda Mountain Wilderness Fire Suppression and Specific Action Plan 2016

The BLM contracts with the Oregon Department of Forestry (ODF) to provide fire prevention, detection, and suppression services. ODF is required to be consistent with BLM resource management objectives in selecting suppression action alternatives. Overall guidance for suppressing wildfires within the SMW is provided in the SMW *Final Stewardship Plan*. Each year since wilderness designation, BLM, in coordination with ODF, has developed a fire suppression plan for managing fire suppression actions in the SMW. The 2016 plan addresses firefighter safety, access, dispatch procedures, use of BLM

resource advisors, prohibited uses under the Wilderness Act (Section 4(c)), and the process for requesting tools, equipment and suppression actions that would normally be prohibited. The BLM meets with ODF and their firefighters pre-season to review the annual fire suppression plan. This process helps to ensure that fires in the SMW are suppressed using the minimum tool and tactics necessary with the long-term goal of preserving wilderness character.



Status of the RMP Implementation Strategy

Although the CSNM has not yet completed a formal RMP implementation strategy, BLM has been implementing RMP decisions including land acquisitions, road restoration/decommissioning, environmental education, transportation management planning, noxious weed treatments, native seed collection, planning for pine plantation restoration, developing partnerships, and recreation projects.

Key National Environmental Policy Act Actions and/or Project Authorizations

Box R Ranch Land Exchange

In response to Congressional action, which gave the Secretary of the Interior the authority to offer to convey two BLM parcels located within the CSNM in exchange for parcels also within the CSNM owned by private individuals (Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, § 1403 and 1404, 123 Stat. 991, 1028 (2009), Subtitle E – Cascade-Siskiyou National Monument, March 30, 2009), the environmental assessment (EA) to complete the land exchange for one of the parcels was completed in July 2014. The EA evaluated the proposal to exchange a 46-acre tract of federal land for an approximate 40-acre parcel of non-federal land. The CSNM stands to gain significant resource values as a result of the land exchange.

- The exchange consolidated federal ownership within the CSNM by transferring adjacent private land (non-federal parcel) and consolidating it with a large block of public land.
- The exchange resolved a long-standing inadvertent trespass on public lands within the boundary of the CSNM.
- Acquisition of the non-federal parcel transferred into public ownership 0.3 miles of Lincoln Creek and 0.3 miles of Keene Creek. Both of these creeks contain valuable riparian and fisheries habitat that would be protected as part of the CSNM.
- The exchange facilitated both the expansion and enhancement of recreation opportunities by consolidating federal ownership with public access. The non-federal parcel is surrounded on three sides by adjacent federal ownership that is unencumbered by improvements.

A revised EA was completed in June 2015 to address new information from cultural resource surveys and concurrence of the State Historic Preservation Office. The land exchange was completed August 29, 2016.

GLI Enterprises, LLC (formerly Deerfield) Land Exchange

In response to Congressional action which gave the Secretary of the Interior the authority to offer to convey two BLM parcels located within the CSNM in exchange for parcels also within the CSNM owned by private individuals (Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, § 1403 and 1404, 123 Stat. 991, 1028 (2009), Subtitle E – Cascade-Siskiyou National Monument, March 30, 2009), the environmental assessment (EA) to complete the land exchange for the second of the two parcels was completed in April 2015. The EA evaluated the proposal to exchange a 0.65-acre parcel of federal land for an approximate 0.82-acre parcel of non-federal land. The CSNM stands to gain important resource values as a result of the land exchange.

- The exchange would resolve an inadvertent trespass on public lands within the boundary of the CSNM. Partially on the federal parcel there exists two cabins (believed to be part of the original town of Lincoln) and a residential trailer.
- The exchange would allow for the cabins to be protected through retention in private ownership. Removal of the cabins, if they were retained in federal ownership, could pose the risk of exposing hazardous materials (due to the age of the structures), while completing the exchange and leaving the buildings in place would not pose this risk.
- The non-federal land that the BLM would acquire is an intact, mature forest stand which is immediately adjacent to CSNM lands. Acquiring this stand would help maintain and protect the late-successional and old-growth forest ecosystems in the area. Acquisition of the non-federal land would also provide additional habitat and connectivity for wildlife.
- Since the non-federal land is mostly undisturbed, it is more suited to being managed as part of the CSNM than the developed federal parcel.

Hunter Communications

Hunter Communications, Inc. was granted a right-of-way grant (OR 068168) in November of 2015 to install fiber optic cable that connects a communication office located in Ashland, Oregon with the telecommunication towers located at the communications site on the top of Soda Mountain. The project placed 24-count fiber optic cable both on existing utility poles and underground. The alignment connects with an existing fiber optic cable that is located on utility poles currently ending at the intersection of Road 39-2E-34 and Buckhorn Springs Road

Telecommunication towers on Soda Mountain

to the United States Cellular Corporation (USCC) tower which is located on the top of Soda Mountain. This project crosses several BLM properties both outside and within the CSNM.

The total length of aerial (on utility poles) fiber optic cable placement on BLM property was approximately 8,243 feet (5,100 feet located within the CSNM and 3,143 feet outside the CSNM). The total length of underground fiber optic cable (including that within the Soda Mountain Communications Site) was approximately 7,996 feet and was placed within the road prism of BLM Roads 39-3E-32.3 (Soda Mountain Road), 40-3E-21.1 and 40-3E-21.2 (Soda Mountain Lookout Road). The term for the right-of-way grant was 30 years.

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Year's Projects and Accomplishments

General Accomplishments

Hyatt Lake Campground

Hyatt Lake campground is continuing to reposition to be more fully included as part of the overall monument experience. Several projects have been completed to enhance the visitor experience and provide a more visually appealing environment to the visitor.

Hyatt Lake Campground

Campground Reservation System

The Recreation team spent the last several years putting in place the technology and infrastructure to support the campground's first-ever reservation system. Hyatt Lake Recreation Area became part of the Recreation.gov system on February 16, 2014.

In 2016, the entire campground was moved to the reservation system, with the exception of the walk-in campsites. All three loops of the developed campground as well as the primitive Wildcat Campground are available through the system, as well as all three of the group use areas. User conflicts for sought-after sites and visitors attempting to stay longer than the 14 day limit were greatly diminished through use of the new system. Visitor data used in the reservation system reveals a wider range of geographic locations for recreationists visiting Hyatt Lake. Visitors from all over the US, as well as international individuals, are now better able to plan trips to Hyatt Lake and the monument.

In 2016, Hyatt Reservoir recovered significantly from the previous two drought years due to a good winter snowpack, reaching 80% of capacity.

View of Hyatt Lake Reservoir from Hyatt Lake Recreation Area

Current Areas of Focus

Soda Mountain Wilderness Restoration and Road Decommissioning

The Soda Mountain Wilderness Stewardship Plan calls for restoring and "re-wilding" about 23 miles of wilderness roads and removing 81 culverts. The legacy road system in the SMW was surveyed and restoration was grouped into eight priority treatment areas based on the risk to the aquatic system, culvert density, and logistically feasible treatment areas. The BLM was able to amass funding from various sources to complete restoration work on a number of roads located near the Pacific Crest Trail and Pilot Rock, in some of the most scenic areas of the Soda Mountain Wilderness. Work will continue on the priority restoration areas, one by one, as funding allows.

In 2016, road decommissioning work continued in the Soda Mountain Wilderness. A 0.6-mile former route on Soda Mountain was removed and a perennial stream crossing and two perennial spring areas were restored.

Former communications site removal near SMW

A number of other man-made features were also removed from the CSNM in 2016. Using WorkSource One (Job Council) crews, 1.5 miles of barbed wire fence and posts were removed from the SMW. A former communications site consisting of an access road and cast concrete foundation was completely removed and restored adjacent to the SMW. Additional infrastructure was also removed along Skookum Road adjacent to the SMW, including two unneeded cattleguards and an old metal gate.

Soda Mountain Wilderness Stewardship Plan

In 2016, work continued in the monument focused on implementing activities approved in the SMW Stewardship Plan (2012): land exchanges, land acquisition, developing the transportation management plan, and developing and enhancing partnerships. Improvements to the visitor experience were accomplished across the monument and wilderness area through interpretation, education, improvements in recreation facilities, and enhanced recreation opportunities.

Implementation of the CSNM RMP (2008) and the SMW Stewardship Plan (2012) will require substantial funds and decades to complete. Work includes road closures and decommissioning, maintenance of existing roads, trail construction and maintenance, noxious weed treatments, removal of human effects from the SMW, removal of old range facilities, fences to be maintained to keep livestock and feral horses out of the wilderness/monument, acquired lands to be restored, and fuels to be reduced in the urban interface. Title II money was used to continue to utilize the Siskiyou Mountain Club crew to implement wilderness restoration. Money was also obtained to rebuild and strengthen fencing around the Soda Mountain Wilderness to keep unauthorized cattle out. The funds for this project were awarded in September 2015, and the contractor began work in the spring of 2016. Funding for the remaining priority restoration areas identified in the SMW Final Stewardship Plan is uncertain as there are no dedicated funds for this ecologically significant work. Additionally, the CSNM Transportation Management Plan will identify many more miles of roads outside of the SMW that need restoration work. The monument

staff continues to explore possible ways to accomplish the remaining restoration within the CSNM/SMW.

Pacific Crest National Scenic Trail maintenance.

In 2016, the Pacific Crest Trail Association (PCTA) and the Siskiyou Mountain Club cleared down trees and performed trail tread maintenance on over 20 miles of the Pacific Crest Trail.

A student in the PCTA Trail Skills College helps maintain tread on the Pacific Crest Trail

Commercial Recreation Permits

The Cascade-Siskiyou National Monument RMP allows for limited commercial use for activities that are determined to be consistent with CSNM objectives. A Special Recreation Permit (SRP) Evaluation Criteria process was established in 2014, identifying potential permit availability, thresholds, and adherence to existing monument management plans and missions. For 2016, the monument re-issued a SRP to an organization conducting guided bird watching activities for profit. Once again, the activity was determined to be scientific in nature and it furthers the monument's mission of biological diversity and scientific exploration. The activity required a permit due to the fact that the organization was conducting this activity in pursuit of a fund-raising endeavor.

Education, Outreach, and Interpretation

CSNM has a dedicated Interpretive Specialist position that administers its Education, Outreach and Interpretation program. The position also provides interpretive and educational assistance to the Ashland Resource Area and the Medford District.

Environmental Education

***Fall in the Field* Program** - Now in its 7th year, *Fall in the Field* is a successful partnership between CSNM and Southern Oregon University's graduate program in Environmental Education. *Fall in the Field* is the capstone project for each EE grad cohort, culminating their 18-month program. During the 2016 field season, the program hosted **723** students, and **102** adults including teachers and chaperones. Most of the students served were elementary age (K-6) and a few middle and high-school students. Grad students advertised the program in the Spring of 2016 and the program dates were filled by early summer.

The *Fall in the Field* program is supported through an agreement between CSNM and Southern Oregon University. In FY16 CSNM provided $20K for program expenses that included supplies and materials, as well as small stipends for the grad students. The CSNM Interpretive Specialist served as program officer and provided technical expertise for the program and its financial administration.

Fall in the Field is also supported financially by the monument's Friends Group. The Friends provide bus transportation stipends to help classrooms participate in the program that would otherwise not be able.

Fall In The Field Student

Students learn about the monument's unique natural resources through a series of hands-on activities that are aligned with state standards in all subject areas, particularly science. Programs utilize best practices in environmental education techniques and theory with a strong emphasis on field biology.

This day program was offered at two locations: Hobart Bluff trail and Greensprings Loop trail. Students were greeted as they got off the bus by the SOU grad students and then participated in activities along the trail. Impacts to the resource were kept to a minimum by following *Leave No Trace* principles.

Outreach

CSNM leads and participates in a number of outreach events throughout the year. Participation in these events is designed to further enhance the publics' understanding and appreciation of the monument and other area public lands.

Public and Youth Events

CSNM participated in a variety of public and youth events in the Rogue Valley. The purpose of event participation is to highlight the monument and its role in the community. With the release of the monument's transportation plan draft, these events also provided an opportunity for members of the public to talk with agency employees directly.

- Sportman's Show – February – Central Point
- Earth Day Festival – May – Ashland
- Hike and Learn Series, Friends of CSNM – May-October – various locations at CSNM
- Community Symposium – May – Southern Oregon University campus, Ashland
- Free Fishing Day – June – Hyatt Lake Campground, CSNM
- August Institute Teacher Fair – August – Jacksonville

Interpretation

Interpretation in the monument continues to be delivered via personal and non-personal services (or interpretive media).

Greensprings Trailhead Kiosk

Non-Personal Services (Interpretive Media)

The monument has interpretive media designed to meet visitor frequently asked questions and basic orientation needs. Interpretive media includes website, social media, site bulletins, a monument newspaper, trailhead kiosks and wayside exhibits.

CSNM site bulletins are stocked at the monument contact station and are available online. The monument newspaper allows for more in-depth information on natural and cultural resources and contains hiking information.

CSNM website information is coordinated through OR/WA state website personnel. Request for updates are handled in a timely fashion and generally the CSNM website is up-to-date. CSNM social media presence is similarly handled through the state office. The monument does not have a dedicated Facebook page and access can be confusing from the state office site.

The Interpretive Specialist continues to work closely with the agency sign shop in the design and development of new trailhead kiosks at Pilot Rock and Hobart Bluff. The kiosk hardware was purchased in FY16. It is anticipated the panels for the kiosks will be completed in FY17.

The monument's Junior Explorer booklet is in the final phases of development. The name will be changed to Junior Ranger in alignment with the new national BLM program name change.

As inventory of old interpretive media is exhausted, new CSNM interpretive media will incorporate the new National Conservation Lands watermark/graphic identity.

Personal Services

Personal services include interpretive walks, talks, interpretive and educational programs, and other visitor contacts. The monument continues to provide these types of services through its partner organizations, The Friends of Cascade-Siskiyou NM and Southern Oregon University.

Participants on the Watersheds Hike and Learn

Friends of CSNM provided six field trip opportunities in 2016 through their *Hike and Learn* program. Each program had a one-hour Friday night presentation and a full-day Saturday field experience. This year the program reached more than 123 participants, many of whom were first-timers. The 2016 programs included:

May 13 & 14 ***Feeling the Geologic Rhythms of the Monument: Hiking Greensprings Mountain to Little Hyatt Reservoir*** with geologist **Jad D'Allura**

June 10 & 11 ***Conifer Species in the CSNM - Taxonomy, Key Identification Characteristics and their Ecological Role*** with **Doug Kendig**

July 22 & 23 ***Beavers and Watersheds*** with biologist **Michael Parker**

August 12 & 13 ***Exploring Place Through Nature Journaling and Field Sketching*** with **Mary Silva** and **Katie Boehnlein**

September 16 & 17 ***Writing Wild: Exploring Our Nature in the Cascade-Siskiyou National Monument*** **with poet Pepper Trail**

October 14 & 15 ***Capturing Fall at The Cascade-Siskiyou National Monument*** **with photographer David Lorenz Winston**

Partnerships

Friends of Cascade-Siskiyou National Monument

The Friends Group continues to be a robust partner of the monument. Board members include monument residents, community leaders and Southern Oregon University students. The Friends Group continued its activities including its *Hike and Learn* series, the student research grants, the community symposium, its annual BioBlitz, and fundraising events.

2016 was a record-breaking year for the Friends Group – donations were at an all-time high, as well as participation in Friends' events.

Friends Group Board Members at the Friends National Conference 2016

Pacific Crest Trail Association

The centerpiece to this vital partnership is the *Big Bend Trail Skills College* hosted by the Pacific Crest Trail Association (PCTA) and the BLM. In its sixth successful year, the three-day college features certifications in crosscut saw and chainsaw use and conducts classes on trail tread construction techniques and hydrology management. The class is a hands-on projects-based course aimed at on-the-job training focused on real trail and maintenance issues. In 2016, 45 volunteer students were enrolled in the class, drawing participants

from many federal agencies and partner groups. PCTA assisted the BLM in coordination of trail volunteers and projects contributing over 900 hours to PCT trail maintenance.

PCTA Trail Skills College participant learns crosscut saw usage

Pacific Crest Trail Association's Trail Skills College, held annually on the CSNM

Siskiyou Mountain Club

The mission of the Siskiyou Mountain Club (SMC) is to restore, maintain and promote primitive back country trails within the local region, and to provide service-based outdoor experiences for the public. The SMC coordinates stewardship projects with youth, volunteers and staff members. In 2016, SMC used crosscut saws or "misery whips" to remove dead and hazardous trees in the Soda Mountain Wilderness. They continue to maintain the Lone Pilot and Pilot Rock trails.

Volunteers

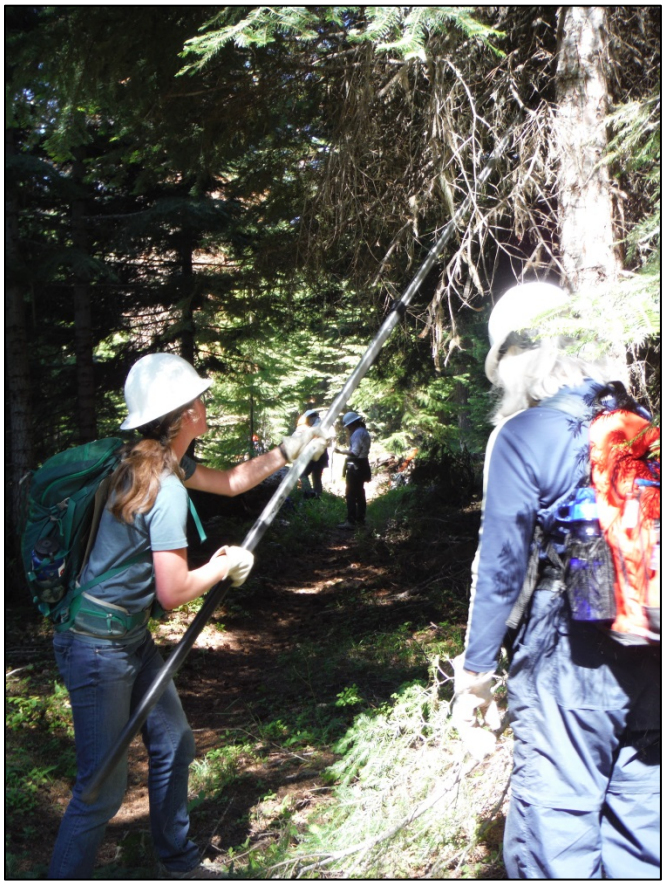
American Hiking Society

In the spring of 2016, the monument hosted an American Hiking Society (AHS) Volunteer Vacation. These trips provide an opportunity for volunteers that are interested in trail work and recreation site maintenance to give back to the places they love to visit. The process for these trips starts with proposals submitted to AHS by host organizations. AHS evaluates the proposals and selects trips that they feel best match the outdoor experiences sought by the individuals that sign up for these trips.

American Hiking Society volunteers and BLM staff on the Pacific Crest National Scenic Trail

The maximum group size for this trip was set at 10, and the trip filled up quickly with people coming from Hawaii, Connecticut, Maryland, California, Oregon, and Nevada. The

volunteer crew camped for the week at the BLM's Hyatt Lake Recreation Area. Each day the crew left for different trail work projects. Most of the work focused on the Pacific Crest National Scenic Trail, but other trails such as Grizzly Peak as well as the Pilot Rock and Lone Pilot Trails in the Soda Mountain Wilderness were visited too.



American Hiking Society volunteers brushing CSNM trail

Volunteers helped perform annual maintenance including winter tree blowdown removal, brushing for equestrian standards, and grade dip and water bar installation and maintenance. In total, volunteers maintained over 11 miles of trail.

National Public Lands Day 2016

The BLM Medford District, Ashland Resource Area, held National Public Lands Day (NPLD) in the Cascade-Siskiyou National Monument at Hyatt Lake Campground. The event was a huge success, with 11 skilled volunteers in attendance. Important maintenance work in Hyatt Lake Campground was accomplished, including raking campsites, picking up garbage, and removal of outdated signs. Lunch was provided by GreenLeaf Restaurant and REI donated some great items that were raffled off to several lucky volunteers.

Signage replacement at Hyatt Lake Campground during National Public Lands Day

NPLD volunteers clean up Hyatt Lake Campground

NPLD volunteers and BLM staff at Hyatt Lake Campground

Southern Oregon Nordic Club (SONC)

SONC is the cornerstone partner of the winter recreation program. SONC is a cross country skier based user group with a mission to promote Nordic skiing and non-motorized winter sports through education, trail maintenance and development, and the organization of group activities. SONC volunteers provided over 80 hours of work through the operation of BLM's tracked Polaris ATV to pull a track-setter and trail re-conditioner to groom trails within the Nordic Ski Area System. SONC also assisted the BLM in organizing volunteer trail work groups to install signs, kiosks, and maintain winter trails.

CSNM Nordic trail system

Free Fishing Day

On June 4 2016, BLM partnered with USFS and hosted a free fishing day event at Hyatt Lake, drawing nearly 100 people.

Other Volunteer Activities

Other volunteer activities include individuals who donate their time for trail maintenance, species monitoring, and outreach activities. Recreation staff had several volunteer events in the spring to repair sections of the PCT.

Free Fishing Day at Hyatt Lake in the CSNM

Volunteers clearing the Pacific Crest National Scenic Trail

Land (or Interests in Land) Acquisitions

In 2016, work continued on land acquisition efforts. A land exchange was completed on August 29 that transferred an isolated 46-acre tract of federal land near a developed area for an approximate 40-acre riparian parcel of non-federal land. The CSNM gained significant resource values as a result of the land exchange. The success of the land acquisition program is due to the dedication of District, State, and Washington Office BLM staff and many partners, including Pacific Forest Trust, The Conservation Fund, Meriwether Southern Oregon Land & Timber LLC, Brian and Kathleen Dossey, Ed Cottrell, Ada Rivera and many others.

4 Science

Science

Cascade-Siskiyou National Monument serves as an outdoor laboratory that attracts a variety of scientists, university researchers and their students.

The BLM sponsors and collaborates with numerous scientists, academic researchers, universities and other partners that fulfill CSNM research needs. Monument staff are guided by a draft Science Strategy in order to gain a better understanding of monument resources and natural processes, and apply science to management, environmental education and public outreach. For a complete list of science projects occurring in the CSNM, refer to Appendix A: 2016 Science, Monitoring and Inventory Programs.

2016 Science Highlight – Cascade-Siskiyou NM Science Symposium

In collaboration with the BLM, the Friends of Cascade-Siskiyou hosted a Monument Research Symposium on March 3rd at Southern Oregon University. This event featured presentations from university researchers, non-profits, and agency personnel from around the region of current research projects in the CSNM. The 2016 event was attended by 72 people. Presenters included: Dennis Odion reporting on Phil van Mantgem's work on forest dynamics with an emphasis on climate change impacts, fire ecology and the management of forested ecosystems; Darlene Southworth discussing vegetation change following grazing removal in the CSNM; Stewart Janes presenting on the geography of hermit warbler songs; Megan Mortimer-Lamb and Spencer Jones reporting on their progress with geologic mapping of the Western and High Cascades in the CSNM; and a musical exploration of the CSNM with Colin Malloy. A number of the presenters at this symposium were student recipients of a Friends of Cascade-Siskiyou NM research stipend.

Collaborative Research Development with SOU Faculty

Monument staff met with Southern Oregon University staff and students multiple times to improve cooperative research relationships focused on the CSNM and share research interests and opportunities.

Klamath Cooperative of Applied Sciences

A regional research cooperative organizational meeting was held in April 2014 with multiple federal, nonprofits and universities designed to collaborate and share research interests and results. This initial, exploratory meeting with broad interest of nearly 30 organizations was intended as a catalyst to motivate collaboration, leadership and involvement. Interest and communication are ongoing.

Research Projects

- On August 28, 2014 the USFWS listed the Oregon Spotted Frog as a threatened species under the Endangered Species Act and proposed critical habitat within the study area. As a result, the importance of this project has elevated. The comprehensive aquatic, riparian, and water quality survey of ten streams in the Cascade-Siskiyou National Monument aims to increase understanding and provide detailed descriptions of the baseline physical habitat characteristics and structure of biotic communities. Status: awaiting final report *(Southern Oregon University, Dr. Michael Parker, Biology)*.

- Dr. Meinke received an NLCS Science Grant to research pollination and fecundity of Fritillaria gentneri, a federally listed endangered species. During 2015-16, a number of individual plants were selected in the monument, with donor plants identified at three recovery sites outside of the monument. Pollination treatments using pollen from the three donor populations were completed in April. Seeds were collected and identified as "good" (apparently viable with an evident embryo), or "bad" (thin and wispy, without an apparent embryo) in August. Successful seed collection took place in 2015, but there was no seed available for collection in 2016. Status: Project complete in 2016, awaiting final report (Plant Division Oregon Department of Agriculture, Dr. Bob Meinke).

A total of 142 pollination treatments were completed in 2016

- Few entomology studies are funded regarding meadow-associated insect species. This study is designed to sample a number of meadows to improve our knowledge of various Bureau sensitive species' range, population abundance, and habitat and to assist in the management for persistence of these species. The target species list and ranks include:
    - *Chloealtis aspasma* (Siskiyou short-horned grasshopper) G1 S1, ORNHIC List1
    - *Bombus franklini* (Franklin's Bumblebee) G1 S1 ORNHIC List 1
    - *Bombus occidentalis* (Western Bumblebee) GU S1S2 ORNHIC List 2

- *Polites mardon* (Mardon Skipper Butterfly) G2G3 S2 ORNHIC List 1

Status: field data collected in 2014, awaiting report (*UC Davis, Dr. Robbin W. Thorp, Professor Emeritus, Entomology).*

- The CSNM science strategy calls for "continued monitoring at suitable time intervals" in order to determine if objects of biological interest are being protected and if management goals are being met. Twelve years have elapsed since the first readings of vegetative transects placed in diverse plant communities and habitats and five years since livestock grazing ceased, a suitable time interval for repeat measurements. Transects were originally surveyed in 2005, and cattle were removed in 2009 as a result of Congressionally-approved livestock permit buy-outs. Researchers resurveyed 38 transects in 2014, recording the herbaceous plant species (or absence of plants), plant height, shrub or tree canopy cover, and ground cover at each of 100 points along 25-m transects. No changes were detected in plant community composition. Wet and dry meadows differed in the extent of change in native and introduced species following removal of livestock. Plant height increased in dry meadows especially outside of exclosures. Species richness declined in dry meadows but remained the same in wet meadows. Native species richness declined in dry meadows while introduced species richness was unchanged in both wet and dry meadows. Introduced graminoid cover increased while native bunchgrass cover remained stable in both wet and dry meadows. In paired transects, plant height increased on outside transects. Neither shrubs nor trees have increased overall. Bare ground (points without plants) increased in dry meadows, but not in wet meadows. Overall dry meadows had the greatest decline in species richness and greatest increase in bare ground indicating a greater sensitivity to grazing conditions and climate change.

  Status: Final report and manuscript completed and submitted in 2016. (*Southern Oregon University, Dr. Darlene Southworth, Professor Emeritus and Henry Whitridge).*

Jenny Creek Sucker

- Jenny Creek suckers were collected and tagged at multiple locations in the mainstem of Jenny Creek during base flow conditions. Approximately 500 adult

Jenny Creek suckers were captured and passive integrated transponders (PIT tags) inserted into the body cavity. PIT antenna arrays were installed at locations in the mainstem and at the mouths of three tributary streams to document seasonal movement of tagged individuals. Jenny Creek Sucker research in 2016 included the continual operation of the pit-tag antennas on the mainstem of Jenny and Beaver and Corral Creeks. Of note, antennas detected one fish moving in and out of Beaver and Corral Creeks. The same fish was detected several weeks later passing the mainstem Jenny antenna. Based on this and previous years information, BLM surveyed both Corral and Beaver Creeks in the late April up through the New Frontiers Ranch looking for signs of spawning suckers. None were found, and very few fish of any type were encountered. Two potential fish passage barriers were identified, including a private road crossing. The landowner was presented a report of the findings. The plan is to operate the antennas for one more season, and unless significantly more detections occur this coming spring than in the past years, the project will be dismantled in the summer of 2017. With cooperation from ODFW (Klamath Falls) biologist Bill Tinniswood, in early May the Fredenburg reach of Jenny Creek was sampled for suckers that appeared to be infected with the suspected parasite *Ligula intestinalis*. Four suckers were euthanized and sent to the ODFW Corvallis research lab for autopsy. The lab confirmed the presence of *Ligula intestinalis*.

Status: 3rd year field data collected. (*Medford BLM, Chris Volpe, Fish Biologist)*

Shocking Fish in Jenny Creek with students from Lincoln School

- The CSNM is collaborating in a regional long-term research project led by Phillip van Mantgem, Research Ecologist, USGS, of natural forest stands in the NPS Klamath Network (Crater Lake National Park, Lassen Volcanic National Park, Lava Beds National Monument, Oregon Caves National Monument, Redwood National and State Parks, and Whiskeytown National Recreation Area), and the CSNM. The study installed 17 large one-hectare forest plots to gather detailed forest structure data that will place forest patterns and dynamics within the context of the abiotic factors and biotic processes. An interim report was completed in 2013. The study measured and mapped over 8,000 trees. The data is intended to understand forest dynamics on biodiversity patterns, with a particular emphasis on land bird communities. Future analyses will include changes in species composition, geographic location and climate (as estimated from the PRISM model).
  Status: study plots established, field data collected, revisits every 5 years. (*USGS, Phillip van Mantgem, Research Ecologist,; Southern Oregon University, Dennis Odion; USGS Joan Hagar, Research Wildlife Biologist; National Park Service, Alice Chung-MacCoubrey).*

- A bumble bee "blitz" was conducted to search for rare bumble bees of special concern: Franklin's Bumble Bee, *Bombus franklini*, and the Western Bumble Bee, *Bombus occidentalis.* This was organized by USFWS Portland office personnel on July 19-20, 2016. The first day was spent on Mt. Ashland where 2 workers of the Western Bumble Bee were found along with eight other bumble bee species. The second day was spent in the Cascade-Siskiyou National Monument. The researchers encountered 8 species of bumble bees, but did not see any of the rare bumble bees. The following bumble bee species were found at Hobart Bluff trailhead area July 20, 2016: *Bombus mixtus, B. vosnesenskii, B. flavifrons, B. appositus, B. californicus, B. griseocollis, B. flavidus, and B. insularis.*
  Status: Blitz conducted on July 20, 2016 *(UC Davis, Dr. Robbin W. Thorp, Professor Emeritus, Entomology)*.

- Strategic survey and inventory of rare and little-known hypogeous fungi in under-surveyed hardwood and mixed conifer habitats in southwest Oregon. Eleven of 34 macro-plots are located in the CSNM. Plots are visited twice in the fall and twice in the spring for three years following a standardized "scuffling" protocol developed by the BLM for hypogeous fungi. Collections are vouchered and identified via morphology or DNA. DNA is extracted, sequenced and validated in GenBank. Additional project proposal funded in 2014 to: clarify characteristics that distinguish rare species from common ones; correlate morphological and molecular data from recent collections; and identify the fungal associates of rare sequestrate species.
  Status: expect 4 to 5 publications, awaiting final manuscripts *(Southern Oregon University, Dr. Darlene Southworth, Professor Emeritus)*.

Annual Inventory and Monitoring

Monitoring of water resources, wilderness values, and specific species continues both by agency personnel and through contracts and university research agreements.

Bureau Sensitive Species Update:

Peregrine Falcons - Agency biologists continue annual monitoring of nesting peregrine falcons (Falco peregrinus anatum) on Pilot Rock. Peregrine falcons were removed from the U.S. Fish and Wildlife Threatened and Endangered Species List in 1999 and are now in Recovery Status. These surveys are part of a national post-delisting monitoring plan to ensure that peregrine falcon populations are remaining stable.

Mardon Skipper - BLM wildlife biologists continue to serve on the Interagency Special Status/Sensitive Species Program (ISSSSP) working groups for the Mardon skipper and the Oregon spotted frog, helping design projects and monitoring efforts.

Oregon Spotted Frog - Dr. Michael Parker of Southern Oregon University is assisting with the study of the Federally threatened Oregon spotted frog. Through Challenge Cost Share projects and his own efforts, he is assisting the BLM to study the effects of landscape heterogeneity and wetland succession on spatial distribution, seasonal movements and long-term viability of the Oregon spotted frog (*Rana pretiosa*) population within the CSNM.

Northern Spotted Owls - Northern Spotted Owls (NSOs) have historically established many breeding territories within the CSNM. Very little monitoring of these sites has taken place in recent years. The habitat that historically supported breeding Northern Spotted Owls remains essentially unchanged, thus it is assumed that NSOs continue to inhabit this area. However, Barred Owls have been documented in areas within a few miles of the CSNM and are assumed to also be present within the monument itself. Barred Owls are known to compete with NSOs for breeding habitat and for prey. Across the range of the NSO, populations of NSOs are continuing to decline. It is likely this is the case within the monument as well.

Gray Wolf - Gray wolves have re-colonized Southwestern Oregon in recent years. No confirmed sightings of Gray Wolves have been documented within the CSNM (except GPS locations gathered from the collar worn by male wolf OR-7). However, breeding pairs of Gray Wolves have been documented both north of the CSNM in Oregon and south of the CSNM in California. It is likely that Gray Wolves are beginning to pass through the CSNM as they hunt or as they move from one area to another. Given that suitable habitat and prey species exist within the CSNM, it is possible that at some point wolves may become established as residents of the CSNM.

Fisher - (*Pekania pennanti*) – Fishers, a member of the weasel family, are a Bureau Sensitive Species and have been documented in the CSNM. They are found in forest woodland landscape mosaics that include conifer-dominated stands. Their occurrence is closely associated with low- to mid-elevation forests with a coniferous component, large snags, decadent live trees, logs, and complex physical structure near the forest floor for denning and resting sites. The mean home range sizes for females are approximately 10 square miles and 24 square miles for males outside of breeding season. Male fisher home ranges can be twice as large during breeding season.

Utilizing various techniques (camera sets, genetic sampling, GPS and VHF telemetry collars), there have been 6 fishers confirmed within the monument boundaries and another 4 proximate to the CSNM boundary. Currently, there is an ongoing study and there are two fishers (1 male and 1 female) with GPS collars within the CSNM. The collars are set to attempt a GPS fix every 15 minutes and to date we have obtained thousands of locations from these two animals.

Fisher in CSNM

Fisher observed during study in CSNM

Northwestern Pond Turtle - BLM continues to monitor the known pond turtle sites. Data collection on population size and age structure continues.

Dr. Parker holding a spotted frog

Mardon Skipper

Northwestern Pond Turtle

Aquatic Ecosystems: Hydrology and Habitat

Objectives for water resources include compliance with State water quality standards to restore and maintain water quality necessary to protect beneficial uses and to follow the

Aquatic Conservation Strategy, which is to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on western Oregon public lands. The following summarizes monitoring efforts of hydrological processes within the monument.

- **Precipitation Measurement** - Monthly and annual summary of rainfall is collected near the stream gauging station on Jenny Creek.

- **Stream Gauging Station** - Water levels (stream stage) are recorded at the stream gauging station on Jenny Creek. Long-term stream flow regimes are determined based on monthly and annual summary information for each water year.

- **Summer Stream Temperature Monitoring Program** - Summer stream temperatures are recorded at 13 locations in the CSNM. This information is used to determine the long-term recovery of Clean Water Act, Section 303(d) Water Quality Limited Streams.

- **Storm Event Grab Sampling** - Turbidity, conductivity, pH, water temperature, air temperature, snowpack and discharge are sampled during high stream flow events at 15 sites within the CSNM as opportunities arise.

Rare Plants

Gentner's Fritillary - Selected populations of Gentner's fritillary (*Fritillaria gentneri*) in the CSNM are monitored annually to track the long-term demographic trends of this Federally listed Endangered Species. As part of the Fish and Wildlife Service's Recovery Plan (FWS 2003), the BLM is collecting and growing Gentner's fritillary bulbets in greenhouses, out-planting them to increase population sizes in specific recovery zones, and monitoring for survival. As resources allow, BLM continues to treat weeds around some Gentner's fritillaria locations and in the Mariposa Preserve (Greene's Mariposa Lily), which results in improved habitat for these species.

Gentner's fritillary

Noxious weeds

In general, weeds are declining in the CSNM due to continued treatments. As new properties are acquired, inventories are conducted and populations treated, which sometimes include extensive weed infestations. Noxious weed treatments continue in the monument, primarily in these areas:

- Box O: 130 Acres of yellow starthistle were treated.
- Soda Mountain area: 61 acres of Canada thistle and 3 acres of dyer's woad were treated.
- I-5/Old Highway 99: 175 acres of yellow starthistle, dyers woad, spotted knapweed and cut leaf teasel were treated.
- Mariposa Preserve: 150 acres yellow starthistle were treated.

- Scattered small infestations north of Highway 66: 35 acres of Canada thistle were treated.

Starthistle-infested hillside in CSNM

5 Resources, Objects, Values, and Stressors

This chapter describes resources, objects, values, and stressors (ROVS) that the CSNM natural resource staff will be monitoring or plan for future monitoring beginning in 2017. Some of this monitoring will be new and some will be a continuation of programs already existing. This is intended to be a comprehensive list of important natural resource ROVS that will be used to measure and monitor the condition, health, and trends in populations and ecosystem structure and function of the CSNM. It is also intended that these programs be synchronized with existing monitoring programs in the region. The Forest Service and the National Park Service have been monitoring particular ROVS in this region for a number of years. A collaborative approach is emphasized because the ability to share data and analyses with neighboring and regional partners gives all of us a richer view of the overall regional condition and needs.

Winter in CSNM

According to the presidential proclamation that established the monument, the CSNM is "home to a spectacular variety of rare and beautiful species of plants and animals, whose survival depends on its continued ecological integrity." ROVS were selected primarily from high priority ecological and biological elements specifically mentioned in the monument's presidential proclamation and establishing legislation. They were also selected because of their ecological importance and ability to gauge the health of an ecosystem. As such, they are called "indicators." Long-term monitoring of these indicators is the process that science uses to determine the present and trending health of a species population, and/or an ecosystem.

In late 2016, the CSNM hired a full time ecologist to plan and implement an effective natural resource monitoring program. This chapter is a summary of our present plans and is meant to guide us into 2017 and beyond regarding our monitoring planning and efforts. It is also meant to be an informative narrative that internal and external groups can use to see where we are headed, and to provide specific feedback for future adjustments.

The following indicators are presented as a comprehensive list. Through 2017 and beyond, the CSNM will work to find state and federal agencies, nonprofits, volunteers, and other partners to identify opportunities for collaboration and to assist with implementation of these monitoring efforts. It is likely that the list of indicators we can actively monitor will be a subset of this list, to be refined over the coming months. The prioritization in Table 1 indicates the ranked approach we will use as our overall guide in establishing a monitoring plan.

Purpose of Long-term Monitoring

Long-term natural resource monitoring at CSNM is a way to scientifically gauge the health of species populations, plant and animal communities, and in particular, ecosystem structure and function. These three elements are vitally linked and the degradation of one reverberates throughout the system creating additional anomalies. The vision of monitoring is to be able to foresee any degradation or trends within an ecosystem early enough to make proactive management decisions that avoid further degradation and large-scale ecosystem harm. The earlier these are realized the more effective we can be at management. The primary objectives of monitoring are:

Autumn aspen

- To simply understand the natural systems better in order to better preserve and protect them.
- To gauge the general health of species populations and ecosystems according to the latest research and best known scientific knowledge.
- To determine the status and trends of selected ecological "indicators" of the condition of monument ecosystems to help managers make proactive and effective decisions and implement science-based adaptive land management.
- To use the information from monitoring as a regional ecological health tool to work more effectively and in collaboration with other agencies, organizations, and neighbors.
- To provide an early warning

system of actual or impending impairment of selected resources in order to be able to proactively fix problems and reduce ecological damage and managerial costs.

- To provide data and analyses to researchers to better understand the dynamic nature and condition of monument and regional resources, and to share the findings with the science community and the public at large.
- To provide a way to measure progress towards management goals.

Indicators Selected for Long-Term Monitoring

Indicators were chosen from important elements of the monument described in the presidential proclamation, from concerns regarding future climate change, and from the latest scientific research about important ecosystem drivers. These include biotic indicators such as individual species populations, and plant or animal communities, or they may include abiotic indicators such as soil texture and chemical composition or water quality.

Table 1 is a list of 28 indicators that are found to be important measures of ecosystem integrity in the CSNM region. The following sections describe each element and provide a brief overview of where we are regarding monitoring and planning at CSNM. Also included is a list of stressors for each element.

Hyatt Lake

TABLE 1. Proposed Monitoring Indicators for Cascade-Siskiyou National Monument

Indicators	Priority	NPS	Procla-mation	
Rare and Endemic Plants				
1. Gentner's fritillary (E) (*Fritillaria gentneri*)	4	N	Y	
2. Greene's mariposa lily (G2) *(Calochortus greenei).*	11	N	Y	
3. Bellinger's meadowfoam (SC) *(Limnanthes floccosa* ssp. *bellingeriana)*	12	N	Y	
Old Growth Emphasis Area Indicators				
4. Northern Spotted Owls (*Strix occidentalis caurina*)	10	N	Y	
5. Old Growth Birds (Pileated Woodpecker, Pygmy Nuthatch, Flammulated Owl, Western Bluebird, Western meadowlark)	6	Y	Y	
6. Fisher *(Martes pennanti)*	20	N	N	
7. Lichen Communities	23	N	N	
8. Habitat Connectivity and Fragmentation	7	N	N	
Diversity Emphasis Indicators				
9. Riparian Health Assessment and Connectivity	9	Y	Y	
10. Semi-Wet and Wet Meadows	13	N	Y	
11. North American Beaver (*Castor canadensis*) Distribution	24	N	N	
12. Oregon Spotted Frog (T) (*Rana pretiosa*) Population Trends	22	N	Y	
13 Freshwater Snail Diversity and Distribution	19	N	Y	
14. Pollinators	18	N	Y	
15. Fish Distribution	21	N	Y	
Plant Communities				
16. Terrestrial Vegetation Monitoring Plots	1	Y	Y	
17. Special Plant communities: Rosaceous Chaparral and Oak-Juniper	14	N	Y	
18. Grazing Impacts	15	N	Y	
19. Forest Dynamics Study Plots (USGS Phillip van Mantgem)	5	N	Y	
20. Non-native, Noxious, and Invasive Plants Mapping	2	N	N	
21. Non-native, Invasive Plants Early Detection	3	Y	N	
Soils				
22. Soil Texture and Chemical Composition	25	N	N	
23. Soil Biological Communities	26	N	N	
Water Quality				
24. Water Quality	16	Y	N	
25. Aquatic Connectivity	8	N	N	
26. Aquatic Macroinvertebrates	17	Y	N	

Rare and Endemic Plants

A number of rare plant species are documented within the monument, and surveys have focused mainly in areas where recent BLM activities have occurred. There are 579 listed plants within the CSNM. Species are prioritized below based on rarity and perceived threats. Specific information is given when indicated.

Rare and Endemic Plants: Status and Trends

Status of Resource, Object, or Value	Trend
Fair	Variable, depending on species; overall stable, however, noxious weed component is declining as a result of BLM's noxious weed/invasive species eradication program.

Rare and Endemic Plants: Inventory, Assessment, and Monitoring

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
65,341	37,055	6,000	4,000

1) **Gentner's fritillary** *(Fritillaria gentneri).*
2) **Greene's mariposa lily** *(Calochortus greenei).*
3) **Bellinger's meadowfoam** *(Limnanthes floccosa* ssp. *bellingeriana);* populations near Lincoln and one small occurrence in the Oregon Gulch RNA.
4) California milk-vetch *(Astragalus californicus);* one population in the monument in the Scotch Creek Research Natural Area (RNA).
5) Tracy's peavine *(Lathyrus lanszwertii* var. *tracyi);* one population documented, also in the Scotch Creek RNA.
6) Clustered ladies slipper *(Cypripedium fasciculatum)*; one existing monitoring plot.
7) Coral seeded allocarya *(Plagiobothrys figuratus* ssp. *corallicarpus);* vernal pool species.

For monitoring purposes the CSNM will first concentrate on the Gentner's fritillary, Greene's mariposa lily, and the Bellinger's meadowfoam. These three species were specifically mentioned in the Presidential Proclamation. If monitoring of these species is successful, or if other species become more endangered, additional monitoring will be added.

Stressors Affecting Rare and Endemic Plants

1. Invasive plants and animals
2. Land use history (Grazing)
3. Climate change
4. Illegal recreation

Invasive species/noxious weeds, land use history, and climate change are suspected to be the principal stressors affecting rare and endemic plants in the monument. Illegal recreation (unauthorized OHV use, mud bogging, etc.) within the monument is also a stressor on rare and endemic plants.

Old Growth Emphasis Area Indicators

Old growth mixed-conifer stand

Old-growth forests are generally over 180 years old and have the following special characteristics: a multi-layered, multi-species canopy dominated by large overstory trees; a high incidence of large trees, some with broken tops; numerous large snags; and heavy accumulations of wood, including large logs on the ground. Late-successional and old-growth forests provide important habitat for species such as the northern spotted owl, western bluebird, western meadowlark, pileated woodpecker, flammulated owl and pygmy nuthatch. Mixed conifer forests are the dominant forest community in the OGEA at CSNM and support a variety of trees including Douglas-fir, white fir, ponderosa pine, sugar pine, incense-cedar, and Pacific yew. Predominately white fir forests are found at higher elevations in the northern part of the monument.

Plant community structure and species richness will be monitored using regional monitoring protocols and will be used to assess old growth forest health. This will be addressed in the Plant Communities section of this chapter. The following additional indicators were selected for monitoring due to their reliance on old growth forests and because of their rapid sensitivity to small changes in old growth forest attributes.

Old Growth Habitat: Status and Trends

Status of Resource, Object, or Value	Trend
Good	Improving as a result of land acquisitions, grazing lease retirements, restoration, and noxious weed treatments. Some decline in resiliency due to fire exclusion resulting in unnaturally dense understory, and risk of catastrophic wildfire.

Old Growth Habitat: Inventory, Assessment, and Monitoring

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
65,341	52,935	24,340	10,000

4. Northern Spotted Owl (*Strix occidentalis caurina*)
The spotted owl is a "keystone" species, and an indicator of old growth for many other forest dependent species. They roost high in large diameter trees with multiple canopy layers in areas with high canopy closure and complex structure. Northern spotted owls are listed as “Threatened” under the Endangered Species Act and are an “indicator” species - the health of the northern spotted owl indicates high structural and functional old growth ecosystem health.

The monitoring protocol for NSOs has been established for many years. The Forest Service has been monitoring NSOs regularly, thus we will be coordinating closely with them in regards to new areas to monitor. New sound recording methods have simplified surveys and will be explored.

5. Old Growth Birds (Pileated Woodpecker, Pygmy Nuthatch, Flammulated Owl, W. Bluebird, etc.)
Because of their potential keystone role, monitoring for viable populations of old growth birds will result in important information about old growth forest health and functioning ecological processes. Standard international avian monitoring protocols have been established for many years and will be adopted for the monument.

The Klamath Bird Observatory may be interested in adding additional monitoring sites on the CSNM. Negotiations will be pursued in 2017.

6. Fisher (*Martes pennanti*)
A resident of coniferous and mixed coniferous forests, the fisher once occurred throughout much of Canada, the northern United States, and the western United States. Fisher populations declined historically primarily due to loss of habitat from timber harvesting and trapping. The fisher always stakes out territories in forests that have a preponderance of old growth. As a result of these and

Fisher captured in CSNM

other findings, fishers and a couple of other species have been chosen by the U.S. Forest Service as a key species to help monitor the ecological health of western old growth forests.

The BLM and Oregon Fish and Wildlife are currently attaching GPS collars to trapped fishers, and beginning to understand activities within the monument. These studies will be used in amassing monitoring data for an analysis of population connectivity, health, and trends.

7. Lichen Communities

Although appearing to be a single organism, a lichen is actually a symbiotic partnership between a fungus and one or more photosynthetic organisms, an alga or cyanobacterium. Lichens are highly valued ecological indicators known for their sensitivity to a wide variety of environmental stressors including air quality and climate change. Lichens are often described as similar to "canaries in a coal mine" because some species are extremely sensitive to environmental change, a major reason for their popularity as bio-indicators for natural resource assessment (e.g., Nimis et al. 2002). The structure of a lichen community in a forest (i.e., species presence and abundance) intrinsically provides a wealth of information about forest health, function, and local climatic conditions. Lichen protocols will be developed in 2017 in conjunction with regional universities. Research on local lichen importance as a bio-indicator will be encouraged and supported by the CSNM.

Lichen community

8. Habitat Connectivity and Fragmentation

Connectivity among forest, woodland, shrubland, grassland, and riparian stands is essential in the effective dispersal and mixing of floral and faunal genetic material for more robust and resilient populations. It greatly increases the dispersal ability of seeds, pollen grains, and animals by providing continuous similar habitat and cover necessary for effective migration. Habitat connectivity is an important indicator of ecosystem robustness and integrity. Plant community types, in particular old growth forest, will be mapped and prioritized for importance to the flow of plant and animal genetic material, and connectivity models will be developed based on topography, plant community type and extent, and other factors.

Stressors Affecting Old Growth Emphasis Area Indicators

1. Loss of habitat connectivity
2. Habitat fragmentation
3. Fire suppression
4. Climate change

5. Illegal recreational activities

Loss of habitat connectivity is one of the primary threats to the ability of the OGEA to function as habitat for late-successional species. Habitat fragmentation resulting from past timber harvests, road building, and other human activities has limited connectivity by creating gaps in the mature forest larger than some wildlife species can successfully cross without being subject to predation or other mortality factors. Fire suppression for the last hundred years has altered the natural fire regime, changed stand dynamics and structure, reduced resiliency, and increased the risk for catastrophic fires. The loss of fire as a natural process has also resulted in a shift toward dense stands of white fir and Douglas-fir at the expense of sugar pine, ponderosa pine, and incense-cedar. Climate change and illegal recreation are additional stressors on old growth habitat within the monument.

Diversity Emphasis Area Indicators

The Diversity Emphasis Area at the CSNM is comprised of hardwood, shrub, grassland, semi-wet and wet meadows, and other areas not comprised of mixed conifers. This rich tapestry of plant communities is characterized by high variability depending on disturbances by nature (i.e. fire, floods, etc.) and humans (i.e. grazing, roads, management, recreation, etc.). Monitoring here will also be covered by our Plant Community monitoring protocols (see below) but included here are additional indicators that will give us a wider picture of the constantly changing dynamics of these important areas.

Diversity Emphasis Area Indicators: Status and Trends

Status of Resource, Object, or Value	Trend
Good	Improving as a result of land acquisitions, grazing lease retirements, restoration, and noxious weed treatments.

Diversity Emphasis Area Indicators: Inventory, Assessment, and Monitoring

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
65,341	37,055	65,341	25,000

9. Riparian Health Assessment and Connectivity

Riparian zones provide a variety of important ecological functions. These include retaining sediment and nutrients (Daniels and Gilliam, 1996; Butler et al., 2006), water storage, flood attenuation (Tabacchi et al., 2000), bank stabilization (Naiman and Decamps, 1997), and regulating stream temperature (Moore et al., 2005). From a holistic perspective, riparian integrity can be defined by a site's relative ability to provide all of these necessary ecological functions. It has been shown by numerous studies that healthy riparian areas

are crucial to healthy ecosystem function, especially to the cycling of energy and nutrients through plants, and all levels of the animal communities of an area.

The CSNM will devise a riparian protocol based on the collection of repeatable data that can show the health and trends of a riparian system. Regional and national protocols will be incorporated with National Park Service standards when developing protocols.

10. Semi-wet and Wet Meadows

Meadows are often hot spots of biodiversity. These areas provide a variety of habitats for a wide diversity of organisms. The species composition and vegetation condition of meadow communities are closely linked to environmental conditions, and based on narrow adaptations to gradients of temperature and moisture (Knight 1994).

Plant communities and the extent of meadow hydric soils will be monitored. Specific meadow-dependent species will be a focus when planning meadow monitoring protocols.

11. North American Beaver (*Castor canadensis*) Distribution

Beavers are an important source of ecologically important disturbance in natural ecosystems. By altering the physical structure of landscapes, they induce a chain of biotic and abiotic events that lead to increased habitat and species diversity. Indeed, the success of many species depends directly upon environmental conditions induced by beaver activity. The shift of habitat from forest streams to open ponds, shallow marshes and fertile meadows provides opportunities for the existence of a great diversity of life in areas that would otherwise remain static in their climax state. The beaver is behaviorally unique among mammals, in that very few can significantly alter the environment in order to meet its needs for survival. It is this survival strategy and its influence on the physical, chemical and biological nature of the surrounding environment that results in profound effects on the ecology of inhabited areas. Due to its extensive role in ecological alteration, the beaver is referred to as an ecosystem engineer and as an important indicator species. Because such ecological alteration disproportionately influences ecosystems (e.g., species composition) in relation to its abundance, beavers also qualify as keystone species (Rossell et al 2005).

The control of stream hydrology stands as the foundation of the beavers' role in ecological alteration. Beaver dams reduce the velocity of streams and cause their expanse over large areas. This spreading out of the water greatly increases wetland habitat, making resources available to a multitude of aquatic and riparian organisms. With the water table elevated, near-shore conditions provide suitable habitat for moisture-loving trees such as willow and alder. Even species located far from stream and pond banks find relief during drought conditions as their roots capture moisture provided by elevated ground water levels. A multitude of fungal and insect species flourish in flooded environments and provide a vital food source for insectivorous birds and amphibians. The remaining snags of drowned vegetation provide an important habitat component for these insects and the birds that feed upon them. In addition, such snags provide the unique nesting site requirements of several species of waterfowl and woodpeckers (Rossell 2005).

It is not only the surrounding terrestrial habitat that shifts in the presence of beaver activity. The aquatic environment itself undergoes changes that critically affect ecosystem

structure and function, thus benefiting threatened species like the Oregon spotted frog, snails, butterflies and other invertebrates.

12. Oregon Spotted Frog (T) (*Rana pretiosa*) Population Trends

The Oregon Spotted Frog, a federally Threatened species, is the most aquatic native frog in the Pacific Northwest. It is almost always found in or near a perennial body of water that includes zones of shallow water and abundant emergent or floating aquatic plants, which the frogs use for basking and escape cover (Leonard et al. 1993, Corkran and Thoms 1996, McAllister and Leonard 1997). Oregon spotted frogs seem to prefer fairly large, warm marshes (approximate minimum size of 9 acres that can support a large enough population to persist despite high predation rates (Hayes 1994) and sporadic reproductive failures. Large concentrations of Oregon spotted frogs have been found in areas with the following characteristics: (1) the presence of good breeding and overwintering sites connected by year-round water; (2) reliable water levels that maintain depth throughout the period between oviposition and metamorphosis; and (3) the absence of introduced predators, especially warm-water game fish and bullfrogs (USFWS https://www.fws.gov/oregonfwo/articles. cfm?id=149489458).

Parsnips Lakes

Efforts are being made to eliminate and to prevent future introductions of bullfrogs and warm-water game fish from spotted frog habitat. Active management is also required to control non-native plant species like reed canarygrass. Protecting Oregon spotted frog populations through maintaining healthy aquatic habitats will continue to be the key objective of land managers.

Oregon spotted frogs have been monitored in CSNM for a number of years in conjunction with wok by Dr. Michael Parker of Southern Oregon University. This work will be synthesized and incorporated into new monitoring protocols.

13. Freshwater Snail Diversity and Distribution

Freshwater snails are important indicators of stream and ecosystem health and function. Certain watersheds in the CSNM are noted for their unique snail species and diversity. In particular, Spring Creek and Jenny Creek are globally important in freshwater snail diversity (Kerr 2010). Understanding the distribution, habitat needs, and biology of these species will help managers not only protect this important faunal group but also protect the ecosystems on which they depend. Protocols will be developed using accepted techniques developed by malacologists' at the Xerces Society, academia, and other sources highly experienced in snail identification and monitoring. Basic research will be encouraged and supported by forming close relationships with regional universities

14. Pollinators

Pollinators are composed of a number of invertebrate groups including butterflies, moths, bees, flies, etc. Butterflies and moths are flagship species for conservation in general, and

in particular for invertebrates. A flagship species group is an excellent ecosystem monitoring indicator because they are sensitive to changes in the environment and act as a very effective early warning system. Butterflies and moth numbers and diversity are important indicators of a healthy environment and healthy ecosystems. They indicate a high diversity of other invertebrates and other animal groups, and are an important part of the food chain. They are prey for birds, bats and other insectivorous animals. Most pollinators not only fertilize plants but support a range of other predators and parasites, many of which are specific to individual species, or groups of species. Butterflies and bees, in particular, have been widely used by ecologists as model organisms to study the impact of habitat loss and fragmentation, and climate change.

Areas rich in pollinators are usually healthy and rich in biodiversity. Pollinators collectively provide a wide range of environmental benefits, including providing food for other animals, plant pollination, and natural pest control. The long history and popularity of butterfly study has provided a unique data resource on an insect group unmatched in geographical scale and timescale anywhere in the world. This has proved extremely important for scientific research on climate change. Area and isolation of habitat patches are vital factors in ensuring species survival across a landscape (Hanski, 1999). However, research suggests that because rare species are restricted to very specific habitats or niches, it is just as important to maintain high quality habitat within individual sites, so as to maintain a regional ecological network (Thomas et al., 2001).

The CSNM is considered to have one of the highest diversities of butterflies and moths in North America. This legacy contributed to the area being designated as a monument and is specifically mentioned in the presidential proclamation that formed the monument. Research and monitoring of pollinators in CSNM is a vitally important aspect of understanding the monuments ecosystems.

CSNM staff will work with researchers, agency experts, and conservation groups to study and monitor pollinators in the monument. Data collected on species diversity and population trends will be shared amongst many groups in order to assess local, regional, and world trends. Monitoring protocols will be developed working with a variety of groups.

15. Fish Diversity and Distribution

There are many miles of stream in the watersheds of the CSNM that support fish. The Jenny Creek watershed, for example, supports over 768 stream miles with an estimated 58 miles that support fish populations. In this one watershed, 15 species of fish have been found, only 5 of which are native. Of the native fish, three are widely distributed throughout the watershed. The Jenny Creek redband trout and the Jenny Creek sucker are endemic to the watershed, while the speckled dace is also endemic but also found in other parts of the Klamath River Basin. The two remaining natives, the marbled sculpin and Klamath River lamprey, are confined in the monument to the lower 2 miles of Jenny Creek below Jenny Creek Falls (Kern 2010).

Fish population monitoring at CSNM will be coordinated with the state of Oregon Department of Game and Fish and other agencies active in fish population trend monitoring.

Plant Communities

DEA plant community

The mixed conifer and white fir forests are predominately located in the in the northern portion of the monument. Mixed conifer forests are the dominant forest community in the OGEA and support a variety of trees including Douglas-fir, white fir, ponderosa pine, sugar pine, incense-cedar, and Pacific yew. Predominately white fir forests are found at higher elevations in the northern part of the monument.

South of Keene Ridge, mixed conifer forests occur in isolated stands as opposed to the more contiguous stands in the north. These stands are often surrounded by the grassland and shrubland plant communities of the Diversity Emphasis Area (DEA). Conifer stands south of Keene Ridge are distinctive biologically diverse islands and unique isolated communities that reflect the discontinuity between the southern Cascades and Sierra Nevada.

The DEA is comprised of hardwood, shrub, grass, semi-wet meadow, and wet meadow plant communities. Unlike the conifer communities in the OGEA, the plant communities in the DEA are characterized by large changes in species abundance over relatively short periods of time in response to fire. This is because many plant species have short life spans, and are dependent on fire for reproduction. Herbaceous plants may thrive for only a few years before conditions change enough to prevent growth. Shrub species may become decadent after a few decades, and need to be renewed through activation of their seed bank by fire. Furthermore, many hardwood species are dependent on fire for creating conditions favoring their persistence on the landscape. Other plant communities associated with rocky meadows and rock outcrops are resistant to fire and may remain unchanged for long periods of time.

Plant Communities: Status and Trends

Status of Resource, Object, or Value	Trend
Good	Improving as a result of land acquisitions, grazing lease retirements, restoration, and noxious weed treatments. Some decline in resiliency due to fire exclusion resulting in unnaturally dense understory, and risk of catastrophic wildfire.

Plant Communities: Inventory, Assessment, and Monitoring

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
65,341	52,935	65,341	15,000

16. Terrestrial Vegetation Monitoring Plots

Monitoring here will be covered by using existing tested NPS long-term terrestrial vegetation monitoring protocols. Crews from the NPS may be hired to install the original plots. The number of plots for each plant community will be determined using analyses and protocols established by the NPS. By incorporating NPS protocols, this monitoring will not only give us trends within the monument but within the region as a whole. Relating our data with regional and national sources is an important part of assessing trends.

17. Special Plant communities: Rosaceous Chaparral and Oak-Juniper Woodland

The rosaceous chaparral and oak-juniper woodland are unique plant communities in the region and deserve special attention when monitoring. The NPS vegetation community monitoring protocol will be used here with the possible adjustment of some of the protocol in order to ensure the capture of vital data that defines these particular communities. These are special communities that are found at lower elevations, particularly in and around the Soda Mountain Wilderness in the southern half of the monument.

18. Grazing Impacts

Livestock have grazed the Cascade-Siskiyou National Monument (CSNM) landscape in southern Oregon since the mid 1800's (Watson 1932; Hosten et al 2007b). Following establishment of the CSNM in 2000, the Bureau of Land Management (BLM) studied impacts of livestock grazing on objects of biological interest. In particular, to study the effects of grazing on plant communities, exclosures were constructed with vegetation monitoring transects placed inside and outside these exclosures. Additional transects were established across the landscape, generally located in meadows and other areas containing grasses and sedges used by cattle.

The results of these and subsequent studies are described in detail in Part 4, Science, under the Research Projects section. These studies will be continued in the future.

19. Forest Dynamics

There are several agencies monitoring the conifer forests of the region and they have plots located in the CSNM:

- The USGS is currently monitoring "Forest Dynamics Across The Klamath Region: Pattern, Pace And Mechanisms Of Change." This project has one 1-hectare forest plot within the CSNM and numerous other plots in regional parks.
- The Western Stewardship Science Institute and the Pacific Northwest Research Station, USDA Forest Service are collaborating on monitoring the forest changes in the Oregon Gulch and Old Baldy RNAs using permanent plots. This project is designed to

detect forest community changes with respect to climate change. There are four established permanent quantitative baseline monitoring transects within each of the two RNAs in CSNM, as part of a nation-wide effort to measure climate change on BLM lands.

Conifer forest and meadow in CSNM

- There are permanent, long-term forest stand plots set up by the USFS and BLM. These are macro-plots with a 5 micro-plot design on a 1.6 mile grid. This BLM/USFS inter-agency forest data set is used to describe forest stands, model forest growth, species and demographic composition, fuels, forest legacy, disturbance/changes over time. These are re-measured every 5 years.
- Steve Bridges of Oregon Department of Forestry established eight FIREMON plots. The FIREMON field data and protocols include the following: a) Fuel Loading (FL surface fuel load, fuel bed depth, duff and litter); b) Tree Data (TD for calculation of canopy base height and bulk density); c) Fire Behavior (FB to monitor observed fire behavior within the plots); d) Species Composition (SC point-intercept, nested frequency quadrats and shrub density belt); e) burn severity (Composite Burn Index).

CSNM staff will analyze the products from these data sources and plan additional plots, if necessary.

20. Non-native, Noxious, and Invasive Plants Mapping

In order to understand the magnitude of this problem, and to plan effective treatment and restoration projects, it is important to know what species are in the monument and the extent of their distribution. Mapping these populations is not only a vital step in planning restoration projects but it is also a way of monitoring the extent of spread of these species.

Invasive star thistle in Agate Flats

21. Non-native, Noxious, and Invasive Plants Early Detection

Early detection of new and established non-native invasive plans is a vital element of any successful program for eradication and avoidance of new species becoming established, and restoration of native ecosystems. A monitoring protocol will be established that will focus on the primary vectors for invasive plants entering an area. Roadsides, parking lots, areas with new construction, and zones where the ground has been disturbed will be identified each year and surveyed for incoming problem plants.

Climate change, altered hydrology from impoundments and the road system, ground disturbing activities, and illegal recreation are all influences that favor spread of non-native, noxious, and invasive plants. The existing transportation system within the monument also introduces new species by facilitating human access and disturbance to the land. Additional sources of invasives include inadequate project planning, development, and implementation, where non-native seed is introduced into an area via reseeding, mulching, or bringing in contaminated soil and other construction materials.

Stressors Affecting Plant Communities

1. Habitat fragmentation
2. Fire exclusion
3. High road densities
4. Noxious weeds/invasive species
5. Decreased hydrologic function
6. Past land use history (grazing, mining, etc.)

The primary stressors in the coniferous plant communities of the OGEA are habitat fragmentation from past harvest, road construction and other activities that created gaps; fire exclusion that has caused changes in structure, tree size, and habitat for different species; the wildland urban interface increasing the risk of catastrophic fire; high road densities that impair hydrologic function, create ecological edges, reduce snags, and limit connectivity for some species; noxious weeds/invasive species; climate change; and illegal recreation.

The primary stressors on plant communities in the DEA are noxious weeds/invasive species; altered hydrologic function from past management activities; and removal of fire as an ecological process for fire-dependent plant communities.

Additional Indicators: Soils

Soils are important indicators of ecosystem health. Soil texture, chemical composition, and important biotic communities are all impacted by past land use and current activities. If an area is in need of restoration, knowing the condition of the soils will help with planning and contribute to a more successful restoration effort.

22. Soil texture and chemical composition
Soil testing and monitoring for texture and chemical composition will focus on major plant communities and areas in need of restoration. Areas in need of testing will be prioritized and the number of test sites for each plant community will be determined in consultation with soil experts.

23. Soil Biological Communities
The BLM and the public are just beginning to appreciate the importance of soil biological communities. These biological communities do important work; they fertilize the soil, breaking down dead organisms and releasing nutrients for use by living plants. The BLM now has a website dedicated to this important aspect of the ecology of any area, see

https://www.blm.gov/nstc/soil/index.html. Soil is filled with life. Whole communities, some of them very complex and with distinct functions, are literally right under our feet. In fact, the majority of rangeland ecosystem diversity occurs below-ground and up to 90 percent of the total productivity of rangelands occurs in the soil. These high productivity numbers are not limited to rangelands and, in fact, are accurate for most ecosystems. The importance of healthy soils cannot be understated. The soil food web is a simple way of referring to the functions of the soil biological community. The organisms that are a part of the soil biological community: bacteria, algae, cyanobacteria, fungi, protozoa, nematodes, and arthropods; are the workers that provide nutrients directly to plants through the decomposition of organics in the soils.

Soil monitoring will be in conjunction with soil experts from the BLM and other agencies, and researchers from local universities. Degraded sites and pristine sites will be evaluated and differences analyzed. This program will be the foundation for future restoration and general management of our ecosystems.

Stressors Affecting Soils

1. Climate change
2. Invasive plants
3. Ground disturbing activities
4. Altered hydrology
5. Illegal recreation

Climate change, altered hydrology from impoundments and the road system, invasive species, and illegal recreation are all stressors on a range of fauna within the monument. Fire suppression for the last hundred years has altered the natural fire regime, stand structure, and species composition increasing the risk for catastrophic fires and modifying habitats. The existing transportation system within the monument also impacts fauna by facilitating human access and disturbance to wildlife; affecting hydrologic function and water quality; fragmenting habitat; and reducing connectivity.

Additional Indicators: Water Quality

Water quality has an important impact on the surrounding plant and animal communities and ecosystems. Impacts can vary from subtle to severe and in most cases can be mitigated easily if causes are known.

24. Water Quality

To maintain and enhance vital and functioning ecosystems it is essential that water quality be monitored. Polluted water can have an instantaneous negative impact on the plants and animals, and thus needs to be monitored regularly in order to avert present and future problems. The CSNM will work with the Oregon Department of

Wetland in OGEA

Environmental Quality to determine the most efficient protocols for augmenting their program and supplying CSNM with the necessary data for effective water quality analyses.

25. Aquatic Connectivity

Riparian zones are the most productive and important ecological zones within any ecosystem. They provide a variety of important ecological functions that nearly all plants and animals need in order to survive. Protocols for aquatic connectivity will be developed working with BLM and other agency experts and the main watershed feeder streams monitored.

26. Aquatic Macroinvertebrates

Aquatic macroinvertebrates include crustaceans such as crayfish, mollusks such as clams and snails, aquatic worms, and the immature forms of insects, such as stonefly and mayfly nymphs. Their importance as indicators of water quality and ecosystem function cannot be understated. The Federal Environmental Protection Agency and a number of other state and federal agencies regularly monitor aquatic macroinvertebrates as indicators of ecosystem health. We will be working with these agencies to corroborate on protocols and share data for local and regional trend analyses.

Stressors Affecting Water Quality Indicators

1) Climate change
2) Ground disturbing activities
3) Altered hydrology
4) Illegal recreation
5) Poor restoration planning

Climate change, altered hydrology from impoundments and the road system, ground disturbing activities, and illegal recreation are stressors impacting water quality indicators.

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6 Summary of Performance Measures

The Monument's overall natural resource trends are improving. Current management practices are directed at maintaining and accelerating the upward trend of improving wildlife habitat and plant populations. To date, 12,288 acres have been acquired since designation. These recent acquisitions set the stage for natural resource trends to improve by providing opportunities to enhance habitat restoration and landscape-scale connectivity.

The Monument team is working to restore pine plantations through thinning and fuels treatments aimed at significantly shortening (20 years or more) the plantation's time to reach late-seral structural and compositional characteristics. More work is needed to address the fire and fuel issues, particularly in the wildland urban interface.

Proactive management has reduced the potential for both recreation-related impacts (off-road vehicle use, resource damage at access point parking areas) and existing transportation system impacts (sedimentation, drainage feature failures) on Monument resources. Proactive treatment of noxious weed infestations has helped restore native habitat.

Pine plantation near Chinquapin Mountain

The removal of cattle grazing from roughly 93 percent of the Monument in 2009 allowed for recovery of Monument lands that had been grazed for decades. The removal and restoration of approximately 0.6 miles of roads in the Soda Mountain Wilderness, as well as the removal of the former communications site adjacent to the SMW in 2016 assisted in the restoration of natural processes and aquatic integrity. Removal of interior legacy fences has improved habitat connectivity, as well as enhanced wilderness character.

Summary of Performance Measures

Resource, Object, or Value	Status	Trend
Rare and Endemic Plants	Fair	Variable
Old Growth Emphasis Area Indicators	Good	Improving
Diversity Emphasis Indicators	Fair	Improving
Plant Communities	Good	Improving
Soils	Good	Improving
Water Quality Indicators	Good	Improving

7 Manager's Letter

Successes

Soda Mountain Wilderness Restoration of the Legacy Transportation System

The most significant accomplishment for the year continues to be the restoration work in the Soda Mountain Wilderness. In 2015, the monument was able to complete the third phase of former road rehabilitation in the Soda Mountain Wilderness. The *SMW Final Stewardship Plan* (2012) approved restoration work on approximately 23 miles of former roads within the SMW. The legacy road system in the SMW was surveyed and restoration was grouped into eight priority treatment areas based on the risk to the aquatic system, culvert density, and logistically feasible treatment areas. To date, the BLM has been able to decommission and rehabilitate a number of roads in priority areas of the Soda Mountain Wilderness. In 2016, restoration activities in the Soda Mountain Wilderness Area included removing legacy roads and removing unnecessary infrastructure, as well as improving aquatic habitat.

Soda Mountain Road Spur – before

Soda Mountain Road Spur – after

Environmental Education, Interpretation, and Outreach

Environmental education, interpretation, and outreach continue to grow, successfully showcasing the unique diversity within the CSNM. BLM's partnership with Southern Oregon University completed its fifth successful year of delivering the *Fall in the Field* Environmental Education program. During the 2016 field season, the program hosted 723 students and 102 adults, including teachers and chaperones.

With BLM support, the Friends of the Cascade-Siskiyou National Monument sponsored six *Hike and Learn* activities in 2016, with local university professors and scientists providing guided hikes for a total of 123 participants.

The BLM is grateful to our many partners who help fulfill our outreach and education efforts on behalf of the monument.

Land Acquisition

The land acquisition program in the CSNM has made terrific strides in acquiring and protecting private lands from willing sellers. To date, approximately 12,288 acres have been added to the CSNM with Land and Water Conservation Funds. In 2016, work continued on land acquisition efforts. A land exchange was completed on August 29 that transferred an isolated 46-acre tract of federal land near a developed area for an approximate 40-acre riparian parcel of non-federal land. The CSNM gained significant resource values as a result of the land exchange. The success of the land acquisition program is due to the dedication of District, State, and Washington Office BLM staff and many partners, including Pacific Forest Trust, The Conservation Fund, Meriwether Southern Oregon Land & Timber LLC, Brian and Kathleen Dossey, Ed Cottrell, Ada Rivera and many others.

Friends of Cascade-Siskiyou National Monument

The Friends of Cascade-Siskiyou National Monument (FCSNM) worked closely with monument staff in 2016 to continue to build capacity and position themselves to be a robust partner in accomplishing the monument's mission. In 2016 the Friends worked on educational, outreach, and interpretive activities, and continued to expand their role into assistance with restoration and land acquisition projects to enhance ecological integrity and habitat connectivity within the monument. The monument looks forward to working together with the FCSNM on a number of future projects.

Challenges/Opportunities

Staffing

Staffing for the monument continues to be a challenge. In 2016, the Monument Ecologist was vacant all year, and the Monument Planner position was vacant for six months. The Ecologist position was filled just before the end of the FY, but the candidate was not set to enter on duty until FY 2017. The GS-7 Park Ranger was filled in October of 2015, and the Interpretive Specialist was filled in late December 2015. A number of Ashland Resource Area specialists assist with special projects, but competing priorities complicate scheduling. Progress on planning and implementing projects within the monument/wilderness continues to be hindered by limited staffing.

CSNM RMP and SMW Stewardship Plan

There is limited funding for the long list of actions necessary to implement the RMP and SMW plan. Planned actions include forest restoration (pine plantations/fuels reductions), road restoration (decommissioning /obliteration), trailhead development, noxious weed treatments, removal of range infrastructure that is no longer needed (e.g., fences, stock tanks, cattle guards), restoration of unnecessary water developments, and removal of human effects from the wilderness (e.g., refuse dumps, irrigation pipe, structures). Projects are submitted each year to compete for end-of-year or outyear funding.

Road Maintenance

Roads providing access to popular visitor sites and to private land within the CSNM continue to deteriorate. In the past, road maintenance was funded through road use fees for access to adjoining private land timber harvests and by funds from BLM timber sales. The BLM has had some success in recent years in obtaining Secure Rural Schools and Community Self-Determination Act funds for road grading and brushing on selected high use roads within the monument. However, this resource pool appears to be rapidly disappearing due to decreased funding levels. In the future, monument funding will be needed to maintain the CSNM road systems now being used primarily for recreation and for inholder ingress and egress.

Feral Horses

An emerging issue on the CSNM concerns feral horses moving into the monument from California. These horses are not part of the Pokegama wild horse herd. Near the California border in the Agate Flats area, a group of around 50 feral horses now occupy the monument for part of the year. These horses are creating trails and causing impacts. This issue is being monitored by CSNM staff.

Feral horses in CSNM near California border

Feral horse trail

Hyatt Lake Recreation Complex

The majority of monument facilities and infrastructure reside in the Hyatt Lake Recreation Area and Campground, which was established in 1969. Many of the facilities were built in the early 1970s. While some of the facilities are showing their age, regular maintenance and larger rehabilitation projects are attempting to keep the facilities functioning. Several projects have recently been completed to enhance the visitor experience at Hyatt Lake and provide a more visually appealing environment to the visitor.

However, there is a substantial gap in need versus available funds. The recreation complex is the only campground within the monument and is where the majority of visitors are

introduced to the monument. It is important to fund the facility at adequate levels to represent national monument (NLCS) status.

Recreation Permits

The number of hikes, tours, and commercial use that is occurring, without permits or authorization, is increasing in the CSNM/SMW. Monument staff continues to discover announcements regarding commercial and non-profit groups leading hikes and other events without prior notification or authorization. While there are a number of schools that visit on non-agency led hikes, the exact number is not known. Based on interviews with locals and finding journal caches, about a dozen schools probably visit the monument annually. In the future, monument staff will be exploring opportunities to better address this issue.

Law Enforcement

In 2016, monument staff received numerous reports of poaching, vandalism, and motorized incursions into the wilderness. Ongoing support is needed to continue the positive trends in protecting the CSNM/SMW resources from trash dumping, illegal OHV travel, mud bogging, vandalism, and campground-related issues. There is no dedicated law enforcement presence in the CSNM/SMW. Law enforcement coverage and visibility is essential to provide user education, encourage compliance with rules and regulation, and foster stewardship and awareness of the monument and wilderness and their unique features.

View of Pilot Rock from Hobart Bluff

Appendix A: 2016 CSNM Science, Monitoring and Inventory Program

Resource	Project Title	Partner	Description/Objective	Summary Results	Status
Presentations, Symposia and Collaboration	Presentation: Science in the Cascade-Siskiyou National Monument	Friends of Cascade-Siskiyou NM	Research and education occurring in the Cascade-Siskiyou National Monument. North Mountain Park Nature Center Ashland, OR	5 Research associates presented synopsis of studies. Approximately 72 attendees	March 2016
	Research collaboration with SOU Faculty	SOU and Friends of Cascade-Siskiyou NM	Develop a cooperative research relationship focused on CSNM	Multiple meetings to explore interest and opportunities.	Initiated: 2014, ongoing
	Klamath Cooperative of Applied Sciences	Multiple federal agencies and nonprofits, SOU.	Regional research cooperative with multiple federal, nonprofits and universities.	Organizational meeting on April 15, 2014	Initiated: 2014, ongoing
	Post-grazing Vegetation Change	SOU professors	Revisit vegetation transects post-grazing removal and identify changes taking place	Final report received, publication pending	September 2016

Resource	Project Title	Partner	Description/Objective	Summary Results	Status
Anthropogenic	**Soda Mt Wilderness - Existing Structure Inventory**	None	Locate, inventory and assess existing anthropogenic structures (stock watering ponds, abandoned roads, culverts, water diversions, trash piles, etc.)	Completed binder with locations mapped, description and photos.	Initiated: 2009 Complete Final Report 2010
	Cultural Resource Survey of the Box O Ranch Complex	None	The Box O Ranch Complex covers over 400 acres in southeastern Jackson County, on the northeastern boundary of the Soda Mountain Wilderness. Update to the Box O Ranch Complex. Contains discussion of the context and condition of 6 structures in various conditions of integrity, 4 collapsed structures, 2 linear features, 1 gravesite, and 28 other isolated items or concentrations. Brief discussions about features of the ranch that were recorded in surveys in the 1990s, but are no longer located on the Box O	BLM recommends that the Box O Ranch Complex (BLM site #OR110-1584), as not eligible for listing on the National Register of Historic Places. Various structures and features found within the Box O Ranch Complex, can still portray a	Initiated: 2009 Completed Final Report 2010

			Ranch Complex.	semblance of the ranching experience in southwest Oregon.	
Plant Communities	**BLM Seeds of Success Program** **Native Plant Collection**	Chicago Botanical Garden Conservation Land Management Interns	Project locates native plant populations, photographs, vouchers, and collects seeds of native plants from southwest OR under the Seeds of Success project for long-term germplasm storage and expand the number of species from different eco-regions needed to revegetate disturbed areas in southern Oregon. The proposal targets the collection of diverse bio-types of native grasses, forbs, hardwood and shrub species from diverse eco-regions and elevations.	In 2014 completed 104 wild-land seed collections of over 96 species; collections made in 7 separate NLCS areas Collection categories: Bureau Sensitive Species – 5 NLCS areas – 33 Interns digitized 3,300 vascular plant vouchers from the Medford BLM herbarium into an online, searchable database as a member of the Consortium of Pacific Northwest Herbaria and the Oregon Flora Project.	Initiated: 2009 On-going
	Vegetation Change Following Grazing Removal on the Cascade-Siskiyou National Monument (NLCS Research Support Program 2013)	Darlene Southworth Ph.D. emeritus SOU and Henry Whitridge, M.Sc., SOU	The CSNM science strategy calls for "continued monitoring at suitable time intervals" in order to determine if objects of biological interest are being protected and if management goals are being met. Twelve years have elapsed since the first transect readings and five years since livestock grazing ceased, a suitable time interval for repeat measurements. This project will resurvey 65 transects and analyze the data to gain an understanding of changes in plant communities in various habitats over the intervening years in the context of different grazing regimes, land use histories and particularly in light of removal of grazing in 2009.	Field data collected in 2014 Draft manuscript in 2015	Initiated: 2013 On-going
	Forest Dynamics Across The Klamath Region: Pattern, Pace And Mechanisms Of Change	Phillip van Mantgem, Research Ecologist, USGS; Dennis Odion, Southern Oregon University;	Install 1 ha forest plots to gather detailed information that will place forest patterns and dynamics within the context of the abiotic factors and biotic processes. Long-term research plots of natural forest stands in the parks of the NPS Klamath Network (Crater Lake National Park, Lassen Volcanic National Park, Lava Beds National Monument, Oregon Caves National	Interim report in 2013. 17 large plots installed in the Klamath region including, Crater Lake NP, Cascade-Siskiyou NM, Lassen Volcanic NP, Lava Beds NM, Oregon	Initiated: 2011 On-going Interim Report: 2013

		Joan Hagar, Research Wildlife Biologist, USGS; Daniel Sarr, National Park Service;	Monument, Redwood National and State Parks, and Whiskeytown National Recreation Area), and the BLM's Cascade-Siskiyou National Monument.	Caves NM, Redwood NP and Whiskeytown NRA. Measured and mapped over 8000 trees. Data intended to understand forest dynamics on biodiversity patterns, particular emphasis on land bird communities. Future analyses of change of species composition, geographic location and climate (as estimated from the PRISM model) (Daly et al. 2002).	
	USFS Forest Health Protection Aerial Surveys	Cooperative Agreement between USFS/BLM/ODF	Yearly Forest Health Surveys 1947 to present. Includes CSNM	Yearly Report: **2012 Forest Health Highlights in Oregon, published in 2013**	Initiated: 1947 On-going
	ISSSP: Distribution and abundance of rare sequestrate fungi in southwest Oregon (ISSSSP)	Darlene Southworth Ph.D. emeritus SOU	Three year strategic survey of rare and little-known hypogeous fungi in hardwood and mixed conifer habitats in southwest Oregon from Cascades to the Coastal Range. The project includes; collecting field data, statistical analysis, DNA sequencing, and a research paper. Additional project proposal funded in 2014 to: • To clarify characteristics that distinguish rare species from common ones. • To correlate morphological and molecular data from recent collections of sequestrate fungi, particularly collections in lower elevation conifer-hardwood habitats. • To identify the fungal associates of rare sequestrate species.	Initial project/paper completed: Field data and molecular analyses provide a more complete list of species abundance and diversity, habitat associations, and host species Additional DNA testing and paper: Stable isotope evidence for the saprotropic status of the truffle S*chenella pityophilus* 2013	Initiated: 2010 On-going Final: 2015
	Oak woodland, shrubland and grassland	Darlene Southworth Ph.D. emeritus	Forest stand surveys including plant composition, hardwood structure (branching and diameter-at-breast-	Analysis using multivariate techniques within	Initiated: 2008

	composition and structural surveys.	SOU Kelly McDonald and Jason Pennell (CBG)	height, and stand age) will facilitate understanding of past fire behavior on hardwood-dominated ecosystems of the monument. Create geo-spatial database in GIS.	the statistical package called PCORD. Data gathering complete; working on analysis. Submited journal publication in 2011.	On-going Final: 2011
	Oregon Gulch and Old Baldy RNA **Permanent Forest Plots**	Reid Schuller, Western Stewardship Science Inst. Pacific Northwest Research Station, USDA Forest Service	Oregon Gulch RNA meets OR Natural Heritage cell for rare veg community in Oregon. Designed to detect forest community changes in respect to climate change. The project establishes 4 permanent quantitative baseline monitoring transects within RNAs as part of a nation-wide effort to measure climate change on BLM lands. Designated for research, education, and conservation. The data will become part of an interagency databank for RNAs maintained by the Pacific Northwest Research Station, USDA Forest Service, Corvallis, Oregon. The data will be re-collected every 10 years.	Baseline data recorded in 2010/2013.	Initiated: 2010 On-going
	Current Vegetation Survey **Permanent Forest Plots**	BLM/USFS	Permanent, long-term, forest stand plots. Macro-plot with 5 micro-plot design on 1.6 mile grid. Part of BLM/USFS inter-agency forest data set used to describe forest stands, model forest growth, species and demographic composition, fuels, forest legacy, disturbance/changes over time. Install new plots in acquired lands. Remeasured every 5 years.	Plots characterize existing forest stands, forest health, stand composition, tree growth, change in fuels composition.	Initiated: 1996 On-going
	Joint Fire Science Program **Fuels Reduction in oak woodlands, shrub lands and grasslands of SW Oregon.** **Consequences for native plants and invasion by non-native species.**	Pat Muir, Ph.D. OSU Dept of Botany and Plant pathology	1) Consequences of fuel reduction techniques and wildfire for native plant communities and species of concern. 2) Relationship of fuels reduction methods to invasion of non-native plants. 3) Consequences of seeding treated areas with native grass seed and invasion of non-native species. 4) Similarities and differences in response among the various vegetation types. 5) Fuel models that result from various treatments 6) Spatial description of historic veg communities based on General Land Office surveys		Initiated: June 2003. Final: 2010

wildfire	**FIREMON Plots**	Steve Bridges ODF Retired and Pinehurst School	Established 8 FIREMON plots. The FIREMON field data and protocols include: a) Fuel Loading (FL surface fuel load, fuel bed depth, duff and litter), b) Tree Data (TD for calculation of canopy base height and bulk density), c) Fire Behavior (FB to monitor observed fire behavior within the plots) d) Species Composition (SC point-intercept, nested frequency quadrats and shrub density belt) e) burn severity (Composite Burn Index).		Initiated: 2007 On-going
Wildlife	**Meeting Bird Conservation Objectives in the Klamath Siskiyou Bioregion**	John D. Alexander, MS, PhD Candidate Klamath Bird Observatory	Klamath Bird Observatory (KBO) will use existing bird monitoring data, biotic, abiotic, and climatic variables to model the presence, absence, and distribution of birds within the Monument. develop a bird distribution model that will provide a baseline understanding of the status of birds in the Monument		Initiated: 2010 On-going Final: 2013 Draft Manuscript in Preparation
	Peregrine Falcon Monitoring **USF&W Bird of Conservation Concern** **Bureau Sensitive Species**	None	Assess breeding/occupancy status of one known Peregrine Falcon site. Informal monitoring – data collected as time permits.	Falcons present for several years—breeding about every other year. Results submitted for statewide compilation	Initiated: 2004 On-going
	Fisher Surveys **Federal Candidate Species** **Bureau Sensitive Species**	Sam Wasser, University of Washington USFS Rocky Mt Research Station Genetic Lab	Document presence/absence, distribution and occupancy of Fisher. Utilized hair snares, scat sniffing dogs, and motion sensitive cameras at bait stations. Analyze DNA to identify individuals, population demographics and create database of individuals	Fishers and fisher habitat confirmed in CSNM.	Initiated: 2006 Ongoing
	Northwestern Pond Turtle Monitoring **Bureau Sensitive Species**		Monitor 3 known sites for population size and age structure.	Results showed a good distribution of age classes within the populations.	Initiated: 2008 ISSSSP Completed 2009
	Spotted Frog Monitoring **Federally Threatened Species** **Bureau Sensitive Species**	Micheal Parker Ph.D.,SOU	Yearly monitoring of egg counts, population abundance, and viability. Most easterly population	Update with April report. Number of egg masses consistently 20 or less.	Initiated: 2003 On-going
	Spotted Frog	USF&W	Oregon Spotted Frog	Listed as a	Initiated:

			On August 28, 2014, the USFWS listed the frog as a threatened species under the Endangered Species Act. Proposed Critical Habitat Designation: Awaiting a final rule designating critical habitat.	threatened species under ESA Proposed Critical habitat designation with map available.	2013 On-going
	Franklin's Bumble Bee population and Persistence Monitoring. **Bureau Sensitive Species**	Robbin W. Thorp Ph.D., Emeritus Entomology UC Davis Department of Entomology and Nematology	Continuing effort to discover biological characteristics of bee habitat requirements, potential threats to its existence, and other critical parameters that affect population persistence and viability. A Candidate Notice of Review for *Bombus franklini* has been prepared by Brendan White, USFWS	Populations declining precipitously since 1998. In 2006, one worker was observed after not having found the species the previous two years. No *B. franklini* were observed since 2007	Initiated: 1998 On-going
	Northern Spotted Owl known site monitoring **Federally Threatened Species**	Doug Barrett, Westside Ecological Jenniffer Bakke, Hancock Partners None	Monitor known spotted owl sites on BLM-managed land that could affect operations on industry land. Approximately 15 sites monitored by industry personnel. Spotted owl sites monitored in timber sales at purchaser request – contract obligation. Other sites monitored as time permits – informal monitoring	Spotted Owl survey forms are entered into the BLM database annually.	Initiated: Various On-going
	Bald Eagle nest surveys **Bureau Sensitive Species**	Jim Harper Volunteer	Monitor known Bald Eagle sites for occupancy, breeding status, and reproduction.	Data submitted to Oregon Eagle Foundation for statewide compilation	On-going
	Great Gray Owl monitoring **Bureau Sensitive Species**	None	Monitor known Great Gray Owl locations as time/$ permit – informal monitoring	Data is entered into GeoBOB. Results vary. No recent surveys conducted.	Initiated: 1995 On-going
	Meadow Dwelling Insects	Robbin W. Thorp Ph.D. emeritus Entomology UC Davis Department of Entomology and Nematology	Improve knowledge of various species range, population, and site specific information regarding meadow associated species to assist in management for the persistence of these species. Target Species List and Ranks: Chloealtis aspasma (Siskiyou short-horned grasshopper) G1 S1, ORNHIC List1	Field data collected in 2014. Three species were found in meadows. Bombus occidentalis, Speyeria coronis nr. coronis fritillary, and Chloealtis aspasma	Initiated: 2014 On-going Final report in 2015

			Bombus franklini (Franklin's Bumblebee) G1 S1 ORNHIC List 1 Bombus occidentalis (Western Bumblebee) GU S1S2 ORNHIC List 2 Polites mardon (Mardon Skipper Butterfly) G2G3 S2 ORNHIC List 1	were all found at various locations. *Chloealtis aspasma* (Siskiyou short-horned) was identified at twelve of the thirty-one sites visited. *Speyeria coronis nr. coronis fritillary* were found at Keno Access, Shale Divide, and O'Brien Creek. *Bombus occidentalis* was found in the eastern half of the bioregion, at Buck Divide, Keno Access and Hoxie Creek meadows visiting *Solidago*.	
	NABA Butterfly Counts	North American Butterfly Assoc. (NABA) Compiler: David Hagen, NABA Eugene-Springfield	Yearly monitoring of butterfly species and populations. NABA Butterfly Counts is a compilation of all butterflies observed at sites within a 15-mile diameter count circle in a one-day period. The annually published reports provide information about the geographical distribution and relative population sizes of the species counted. Comparisons of the results across years monitor changes in butterfly populations and study the effects of weather and habitat change on North American butterflies.	53 species found at 2 sites and 947 individuals 15 mile diameter circle is centered at the junction of Highway 66 and East Hyatt Lake Road Latitude: 42.1230 Long: 122.4644 July 4, 2013; 2nd year	Initiated: 2012 On-going
Botany	**Limnanthes flocossa ssp. bellingeriana** **Population Monitoring** **Bureau Sensitive Species**	Kerry Byrne, OR Inst. Of Technology,	Estimated population size (map polygon) and number of plants at two populations; established two 50m transects and randomly selected 10 1m2 plots to count # of plants in each; randomly select 10 plants from population and count flowers, then later count seeds per plant; possible germination study later.	Populations mapped, counted and will be entered into GeoBOB. Data and analysis due by end of calendar year 2015.	Initiated: 2012 On-going

	Greene's mariposa lily (Calochortus greenei) **Population Monitoring and effects of grazing on Greene's mariposa lily (Calochortus greenei) over 10 Years** **Bureau Sensitive Species**	Tom Kaye, Ph.D, Inst. for Applied Ecology	Permanent fenced/unfenced paired plots established. Three study areas that span the range of cattle utilization. In 2003, fifteen pairs of 2 m x 2 m large-mammal exclosures and controls were established in *C. greenei* populations, five in each of the three study areas: In 2007, established a total of 14 1 m x 1 m all-mammal exclosures, with seven in Colestine and seven in Agate Flat. Each individual *C. greenei* plant was mapped, the length and width of each *C. greenei* leaf in all plots was measured, plant height and flower/bud number were also recorded.	Herbivores negatively affected plant size and population viability. Fencing improved conditions. Removing herbivores from plots generally did not result in improvements in native plant abundance, even after 10 years. Grassland vegetation on CSNM that has been degraded due to long-term grazing by livestock is unlikely to improve without additional restoration practices, such as removal of non-native plants and seeding with native vegetation. Climate change may improve conditions. Further research to better measure seed germination and seedling establishment would improve *C. greenei* population modeling.	Initiated: 2003 On-going Final: 2012 Report located at: Medford BLM and http://appliedeco.org/reports
	Gentner's friillaria (*Fritillaria gentneri*) **Population Monitoring** **Federally Endangered Species**	Richard Callagen and Richard Brock Siskiyou BioSurvey	Yearly monitoring of selected populations in Recovery Unit, 4. Annual revisits of 12 selected populations. Tracks long-term change (abundance and phenology) over time by population. Presence/absence and demographic data over time.	Annual Medford Dist. monitoring report. Data updated yearly in GeoBob. Annual Review of Fritillaria Gentneri on BLM Lands 2014 Report Individuals do not flower every year. Populations can only be detected with mature,	Initiated: 1999 On-going

				flowering individuals.	
	Gentner's friillaria (*Fritillaria gentneri*) **Population Augmentation and Monitoring** **Federally Endangered Species**	Bob Meinke, Plant Division Oregon Department of Agriculture	Bulblets grown in greenhouse are out-planted at existing populations to increase population size. Objective is to meet recovery criteria and contribute to recovery of species. Track change (demographic data - abundance and phenology) over time by population.	Reported in semi-annual monitoring report by ODA. Data updated yearly in GeoBob. %50 of individuals out-planted do not survive. Refining suitable habitat characteristics and timing of out-planting to increase survival.	Initiated: 2008 On-going
	Gentner's friillaria (*Fritillaria gentneri*) **Population Augmentation and Monitoring** **Federally Endangered Species**	Bob Meinke, Plant Division Oregon Department of Agriculture	Twenty plants of *Fritillaria gentneri* in the CSNM will be selected for inclusion in the study, selected plants will be caged in wire cages, prior to the development of stigma receptivity, flowers will be bagged with mesh pollination bags, pollen used for pollinations will be collected from plants in Recovery Units 1-3, data on number of capsules produced, number of seeds per capsule, and number of apparently viable seeds per capsule will be collected.		Initiated: 2014 On-going
	Ectomycorrhizae associated with Cercocarpus ledifolius and Quercus garryana var. brewerii in southern Oregon.	Darlene Southworth, Ph.D. emeritus SOU	Survey the diversity and abundance of ectomycorrhizae associated with Cercocarpus ledifolius and Quercus garryana va r.brewerii.	Final results: 18 species of ectomycorrhizal fungi have been identified on roots of Cercocarpus, the first such information anywhere. 5 of these are shared with Q. garryana var. brewerii suggesting a mycorrhizal network linking the shrubs. New species described in journal.	Initiated 2007 Final 2011. Data gathering complete; analysis complete; manuscript submitted, accepted in 2011. Poster presented at Botanical Society of America meeting 2008.

	Movement, Seasonal Habitat Use, and Spawning Locations of the Jenny Creek Sucker (Catostomus rimiculus sp.). **BLM Strategic Species**	David Hering, Fishery Bologist,Crater Lake National Park	Jenny Creek suckers will be collected and tagged at multiple locations in mainstem Jenny Creek during base flow conditions. We will tag approximately 350 adult Jenny Creek suckers (≥120mm) with 12mm half-duplex (HDX) passive integrated transponders (PIT tags) into the body cavity. Install stationary stream-width PIT antenna arrays at one location in the mainstem and at the mouths of three tributary streams (Johnson, Beaver, and Corral Creeks) to document seasonal movement of tagged individuals. Fish movement assessed at two spatial scales: stationary antenna arrays will record fish movements and direction at the stream reach-scale; walking surveys using mobile backpack mounted PIT antennas will identify locations of spawning activity at the scale of a meter or less.	Detected very few fish during the 2013/2014 season (winter and spring). SW Oregon was beset with a record breaking drought, resulting in no significant peak flow events all season. Area reservoirs remain at record lows. The solar panels at several sites did not receive enough light to function continuously resulting in long periods when the antennas were not active.	Initiated: 2013 ongoing
Hydrology	**CSNM/Wilderness Area - Existing Water Structure Inventory**	None	Locate, inventory and assess existing anthropogenic structures (stock watering ponds, roads, diversions, ect). Comprehensive inventory of features in CSNM.	Completed binder with location, description and photos. Data stored at Medford BLM	Initiated: 2009 Complete
	Precipitation Measurement	None	Document rainfall at or near stream gaging stations for use in NEPA planning documents and calibrate streamflow and other monitoring parameters sampled in vicinity. Lower Jenny Cr.	Monthly and annual summary information for each water year. Data stored at Medford BLM	Initiated: March 1999 Ongoing
	Stream Gaging Station	None	Determine long-term streamflow regimes in order to document effects of BLM actions on watersheds. Lower Jenny Cr.	Monthly and annual summary information for each water year. Data stored at Medford BLM	Initiated: Nov. 2003 and March 1998 Ongoing
	Summer - Stream temperature monitoring program	None	Document stream temperatures and long-term recovery of 303(d) listed streams at approximately 13 locations in the CSNM.	Annual summary reports for each site. Data stored at Medford BLM	Initiated: June 1998 Ongoing
	Storm event grab sampling	None	Document turbidity, conductivity, pH, water temperature, air temperature, snowpack and discharge at 26 sites	Monthly and annual summary information for	Initiated: June 1998

			during high streamflow events. Sampling is infrequent as opportunities arise. (15 sites in CSNM)	each water year. Data stored at Medford BLM	Ongoing
Recreation	**PCT Trail Condition**	Pacific Crest Trail Assoc. (PCTA) and Siskiyou Mountain Club	Monitor trail condition, erosion, hazards, condition of previous projects. Monitor portions of trail 2-3 times/year Photo monitoring of restoration projects and selected areas	Pacific Crest Trail Association contributes approximately 80% of monitoring	On-going
	PCT Visitor Use	PCTA	Determine trends over time. Visitor counters placed to detect yearly use.	2002-2006 6,000 yearly 2006-2008 7,500 yearly	Initiated: 2002 Ongoing
	Hyatte lake Recreation Area Visitor Use	none	Monitor Campground, visitor use and activities		Initiated: 2002 Ongoing
Invasive Plants	**CSNM Weed Control**	JR Forestry, OR Dept of Trans, Carrie Pirosko, OR Dept of Agri., Kristi Mergenthaler, Southern OR Land Conservancy, Jonathan Paul Lomakatsi	Conduct weed control on Yellow starthistle, Canada thistle, Dyers woad, Spotted knapweed, Jointed goatgrass, Russian thistle and Teasel using an Integrated Weed Management approach: a combination of hand-pulling and herbicide applications. Treatments primarily located along I-5 corridor, Soda Mt., and Box O historic ranch.	Approximately 500 acres were treated. Infestations mapped and treated. Treatment data shall be entered into NISIMS. Follow-up mapping and treatments in 2015.	Initiated: 2014 Ongoing
	South Cascades Lakes Noxious Weed Inventory, Mapping and Control Project	Mike Meredith, MSM Forestry LLC	Conduct a comprehensive inventory of listed noxious weeds found within the 80,000 acre project area, map them and eradicate them if possible. The focus within the area is along existing passable roads and lakeshores. Inventory, treat and monitor noxious weed sites. Determine presence/absence, extent, and treatment effectiveness	11 noxious weed species were found and mapped. Weeds were found and treated on 142 of the original weed centers. Over 200 miles of road were covered during the search. 161 of the total 339 weed centers had no weeds in 2013. 8 new weed centers were mapped and treated in 2013.	Initiated: 2009 Completed 2014
Grazing	**Lease Compliance checks**	None	Season of use, number and location of cows, sensitive areas. Visit selected range improvement structures (fences, troughs, ponds) to monitor condition.	Repeat non-compliance. Data stored at Medford BLM	Initiated: Early 1970s Ongoing-Annual


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National Monument
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