



**NATIONAL
CONSERVATION
LANDS**

Oregon

Cascade-Siskiyou

National Monument



Annual Manager's Report—Fiscal Year 2017

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1 Cascade-Siskiyou Profile

Designating Authority

Designating Authority: Presidential Proclamation 7318 – Establishment of the Cascade-Siskiyou National Monument and Presidential Proclamation 9564 – Boundary Enlargement of the Cascade-Siskiyou National Monument.

Date of Designation: June 9, 2000 and January 12, 2017

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	170,409
BLM Acres	112,928
Other Federal Acres	80
State Acres (CA)	4,915
Private Acres	52,486

The Cascade-Siskiyou National Monument (CSNM) is located in southwestern Oregon. The original presidential proclamation reserved the CSNM in recognition of its remarkable ecology and to protect a diverse range of biological, geological, and historic objects. Cascade-Siskiyou National Monument was expanded by presidential proclamation on January 12, 2017, adding 47,660 federal acres to the Monument. The expanded CSNM includes federal lands in California, in the Redding District, and in Oregon's Klamath County, in the Lakeview District. 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, the Horseshoe Ranch Wildlife Area (in California) and the Soda Mountain Wilderness. The California Department of Fish and Game lands in the Horseshoe Ranch Wildlife Area are not a part of the CSNM.

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

The Cascade-Siskiyou National Monument boundaries overlap three Field Offices in three District Offices in two States.

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Field Office Name	Ashland	Klamath Falls	Redding
District Office Name	Medford	Lakeview	Northern California
State Office Name	Oregon/Washington	Oregon/Washington	California

Budget

Total Fiscal Year 2016 Budget	\$698,317
Subactivity 1711	\$98,500
Other Subactivities' Contributions	\$599,817
Other Funding	\$0

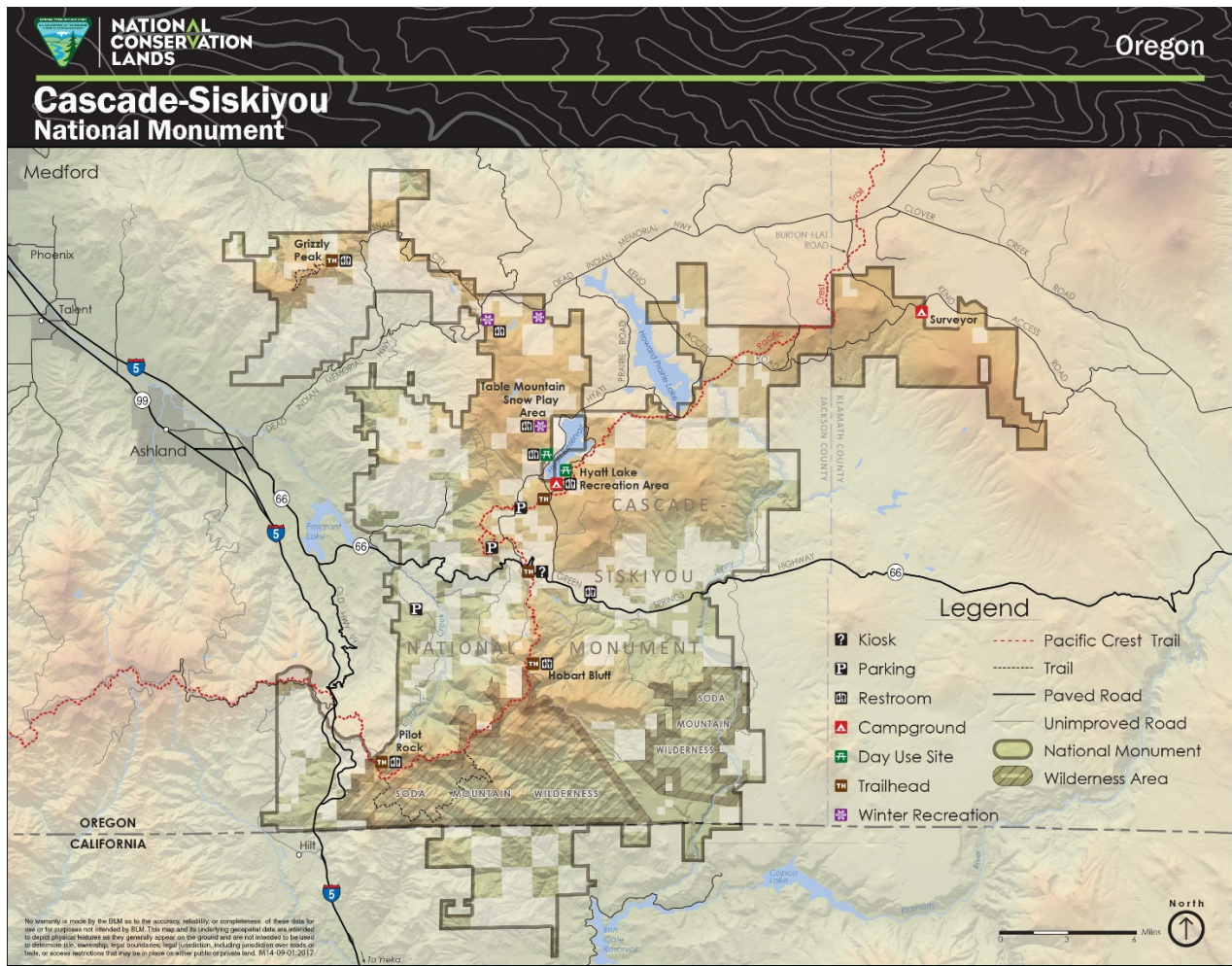
Visitation

The CSNM had approximately 134,479 visitors in FY 2017.



Table Mountain Winter Play Area

Map of Cascade-Siskiyou National Monument



Managing Partners

N/A

Staffing

The CSNM is located within three BLM field offices in three BLM districts in two states. Currently, each field office independently manages their respective portions of the CSNM. The three field managers are the line officers for their respective portions of the CSNM.

The Assistant Monument Manager, Joel Brumm, has operational leadership duties for the Jackson County portion of the monument, supervises monument staff, and manages the monument budget.



Hiker enjoying view of Mount Shasta from Boccard Point 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 2017, the Ecologist and the Monument Planner positions were vacant for three months, with both positions filled by January.

The following table summarizes the positions and percentage of time spent on duties in the Jackson County, Oregon portion of the CSNM:

Position	Series/Grade	Full Time/Seasonal	% Time Dedicated
Field Manager	GS-0340-13	Full Time	20
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	80
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 Ranger (Hyatt Lake)	GS-0025-04	Seasonal	100



View from Hobart Bluff in CSNM

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. This RMP covers the areas of the monument designated in 2000. 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 originally 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.”

The Southwestern Oregon BLM Districts Resource Management Plan and Record of Decision (SWOR RMP/ROD) was approved in August 2016. At this time, the SWOR RMP/ROD guides management in the expansion area in a manner consistent with protection of the resources, objects and values for which the area was designated and to the extent it does not conflict with the Proclamation’s designating language.

Status of Activity Plans

Soda Mountain Wilderness Final Stewardship Plan

The *Soda Mountain Wilderness Final Stewardship Plan* was completed in April 2012 and focuses on enhancing wilderness character. Authorized actions include active and passive

restoration, as well as providing opportunities for solitude and primitive recreation. The plan included several road to trail conversions. The longest of these trails, the Lone Pilot Trail, provides a loop when utilized with the Pacific Crest Trail and maintains access to popular scenic vistas. Completion of these trails from 2013 to 2015 maintained access for hunting, fishing, hiking, and other recreation opportunities in the SMW while enhancing wilderness character.

Soda Mountain Wilderness Fire Suppression and Specific Action Plan

The BLM contracts with the Oregon Department of Forestry (ODF) for 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 was provided in this plan. The BLM updates this plan annually in collaboration with ODF. The plan addresses firefighter safety, access, dispatch procedures, use of BLM resource advisors, and prohibited uses under the Wilderness Act. The plan also outlines the process for requesting and authorizing the use of normally-prohibited tools, equipment, and suppression actions that may be needed depending on fuel conditions and resource availability. This process helps to ensure that fire suppression in the SMW is accomplished using the minimum tools and tactics necessary, with the long-term goal of preserving wilderness character.

Cascade-Siskiyou National Monument Transportation Management Plan

A Notice of Appeal of the CSNM ROD/RMP was filed in September 2008 with the Interior Board of Land Appeal (IBLA). As part of the 2008 settlement agreement on this appeal, the BLM agreed to complete transportation management planning in a timely manner. Congressional designation of the Soda



Buck Tunnel – potential trail site

Mountain Wilderness within the CSNM and preparation of a wilderness

stewardship activity plan and budget constraints delayed planning and analysis on the TMP. Route inventory and field review of the areas with the greatest impacts to aquatic systems began in 2010. An interdisciplinary team was first convened in 2015.

The Draft Transportation Management Plan/Environmental Assessment (TMP) was released for public comment on March 25, 2016. There has been substantial interest from the public and local elected



Legacy transportation route

officials in the CSNM draft TMP. The first comment period closed on November 18, 2016. Numerous comments were received on the draft TMP, leading to additional interdisciplinary team inventory, evaluation, documentation, and analysis of monument roads.

Status of the RMP Implementation Strategy

Although the CSNM has not completed a formal RMP implementation strategy, work has proceeded on implementing RMP decisions. Some examples of recent decisions include land acquisitions, aquatic habitat restoration, noxious weed treatments as well as moving forward with environmental education, developing partnerships, and recreation projects.

National Environmental Policy Act (NEPA) Actions and Project Authorizations

South Fork Little Butte Timber Sale

South Fork Little Butte (SFLB) Forest Management Project Environmental Assessment (EA) and Decision Record (signed August 19, 2015) authorized forest management activities on 2,488 acres of BLM-administered lands within the Lower and Middle South Fork Little Butte Creek sub-watersheds of the Little Butte Creek Watershed. The project also included temporary and permanent road construction (3.04 miles and 0.80 miles respectively), road decommissioning (4.05 miles) and long-term closure of existing roads (7.27 miles), road renovations, and road improvements along haul routes. A small proportion of the project is now within the CSNM. The associated timber sales were determined to be valid existing rights. Five units totaling approximately 30 acres were harvested within the CSNM this year and an additional 180 acres are planned for harvest in 2018.

Howard Prairie Fuels Reduction

Howard Prairie Fuels Reduction Project Environmental Assessment (EA) and Decision Record (signed July 11, 2011) authorized forest management activities on 795 acres. The majority of the treatment areas (approximately 670 acres) are now within the CSNM. One 90-acre unit was mechanically treated in 2017 and several large decks of logs are currently available for community firewood collection. An additional 500 acres that were previously mechanically treated were burned in 2017.

GLI Enterprises, LLC Land Exchange

In response to Congressional action (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 April 2015. An RMP amendment that was first required was completed in 2013. 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 and the exchange would resolve an inadvertent trespass on public lands within the boundary of the CSNM. The BLM land involved in the exchanges contains two cabins that were part of the original town of Lincoln built by John Henry around 1929. Thus, despite currently being in trespass, removal of the cabins is not desired. The non-federal land that the BLM would acquire is an intact, mature forest stand. Acquiring this stand would provide additional habitat and improve connectivity for wildlife within the CSNM.

The decision is pending. CSNM is waiting on legal descriptions from Cadastral for the federal land. The surveys on monument land are complete. However, the private land surveys still need to be completed. In addition, a lot line adjustment will be needed prior to final decision on the exchange. This exchange is reasonably one to four years from completion.

Mountcrest Land Acquisition

The BLM recently purchased 314 acres from a willing seller near Mount Ashland, adding two segments (0.7 miles) of the Pacific Crest Nat'l Scenic Trail to the monument.

Soda Mountain Communications Site

The communications site and all existing communications compounds contained within this site were recognized as valid existing rights. In 2017 BLM completed NEPA analyses and decision records that authorized emergency repairs (see California-Oregon



Broadcasting, Inc. [COBI] below) and lease renewal with modifications (see US Cellular below). Two other ROW renewals with modifications (Oregon Department of Transportation and COBI) have been received and are in the process of review for NEPA requirements. Reference the Site Management Plan for more information on the current site.

Soda Mountain Communications Site

US Cellular ROW Renewal (ROW OR 49604)

The *US Cellular Right-of-Way Renewal Environmental Assessment (EA)* and Decision Record document the BLM's response to US Cellular's request to renew their existing lease and make modifications. The Decision authorized the renewal of the lease for a period of 10 years. US Cellular was authorized to operate and maintain their compound, as well as the access roads, and to make the modifications described in the EA.

California-Oregon Broadcasting, Inc. (COBI) Repairs (ROW OR 36203)

COBI requested authorization of emergency repairs to the power line entry and meter location at their facilities, in order to permanently repair and prevent damage that is reoccurring from winter snowpack. Ground disturbance associated with the proposed maintenance affected less than one acre and the project fit under an existing categorical exclusion authority.

Other requests for new road access ROWs, unilateral timber hauling permits, and re-assignment of existing ROWs

In 2017, BLM responded to requests for new road access ROWs, unilateral timber hauling permits, and re-assignment of existing ROWs. Four other new ROW grants were authorized under categorical exclusions and decision records. Numerous lease re-assignments, primarily near Hyatt Lake, were also authorized. Several other requests have been received and are in the process of review for NEPA requirements.

PacifiCorp completed maintenance to the Lone Pine to Klamath Falls Powerline

After extensive review of the project during the spring and summer by CSNM staff and an interdisciplinary team, it was ultimately determined that existing categorical exclusion for the lease renewal and Decision Record in 2014 and the Soda Mountain Wilderness Stewardship Plan and Decision Record in 2012 covered the heavy maintenance associated with the pole replacements. A letter of authorization was sent on August 11, 2017 and the project was completed prior to the wet season. The letter included project design features (in the form of terms and conditions to be added to the ROW permit) that were followed in order to avoid impacts to cultural resources or endangered plants and to prevent the spread of noxious weeds.



Issuance of Special Recreation Permits

The *Environmental Assessment (EA) of Issuing Permits for the Up and Down Bike Ride and Pacific Crest Endurance Horseback Ride* (EA) was completed in early July. The EA and Decision Record authorized one competitive and one commercial event along existing CSNM roads.

Keene Creek Large Wood Placement Determination of NEPA Adequacy

Redband trout are present throughout the entire length of Keene Creek from its origin at Hyatt Lake Dam to its confluence with Jenny Creek. The project was designed to improve habitat conditions for redband trout. The 2014 programmatic environmental assessment, *Medford District Aquatic and Riparian Habitat Enhancement Environmental Assessment*, analyzed project types consistent with the one in Keene Creek. Approximately 30-35 pieces of large wood from a nearby Bureau of Reclamation project and additional onsite trees (cut to 40-foot lengths) were placed at six sites in the stream channel. These sites were chosen because of the availability of large, mature, bankside trees that assisted in securing the logs into place.

3

Year's Projects and Accomplishments

General Accomplishments

CSNM Recreation



The high biodiversity present in the CSNM presents an astounding array of hunting opportunities



Cascade-Siskiyou National Monument is a popular destination for hunters, with the exceptional habitat diversity contributing to numerous different hunting experiences close to the population of the Rogue Valley. Deer, elk, bear, mountain lion, and waterfowl are all popular game species hunted within the monument. A number of Boone and Crockett trophy records for deer have come from the Soda Mountain Wilderness within the CSNM.

Anglers fish via boat and also shoreside at Hyatt Lake, as well as on Jenny Creek along the eastern boundary of the monument. Dispersed camping is also very popular in the Monument. Snowmobiling, mountain biking (on existing roads as designated by the RMP), riding ATVs (on existing roads as designated

by the RMP), hiking, Nordic skiing, snowshoeing, sledding, birdwatching, and wildlife viewing are also popular activities within the Monument. The Pacific Crest National Scenic Trail travels 41 miles through the Monument, and popular hiking opportunities include the Pilot Rock, Hobart Bluff, Grizzly Peak, and Lone Pilot Trails.

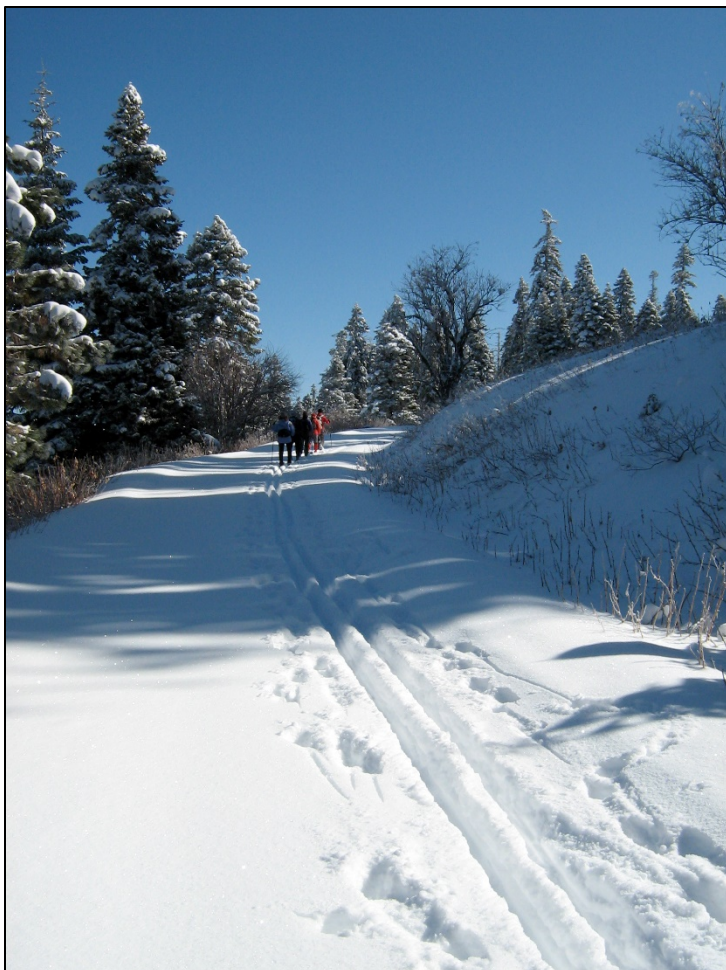


Anglers at Hyatt Lake

The 745-acre Hyatt Lake Recreation Area provides opportunities for developed camping, hiking, fishing, and boating. The main campground offers 54 campsites, showers, flush toilets, a playground, and two boat ramps and dock facilities. In 2012, working in partnership with the Oregon State Marine Board, both boat launch ramps within the Monument were replaced. The Hyatt recreation area also includes Wildcat Campground, a twelve-site shoreline primitive camping experience, as well as a five-site camp area to accommodate equestrian users. Hyatt Campground also contains a group shelter and kitchen as well as a day-use picnic area. During the rest of the season, the area provides shared-use trail



The CSNM offers a great snowmobile experience for families



The CSNM has an extensive groomed nordic ski trail network

opportunities open to snowmobiles and Nordic skiers. Through a partnership with the Southern Oregon Nordic Club (SONC), the BLM maintains a network of over 18 miles of groomed cross-country ski trails in the CSNM. SONC volunteers and BLM staff use a tracked Polaris ATV to pull a track-setter and trail re-conditioner to groom trails within the Nordic Ski Area System inside the monument. The CSNM is also a popular winter destination for backcountry Nordic skiers and snowshoers.

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

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. 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 visitors, are now better able to plan trips to Hyatt Lake and the monument.

In 2017, Hyatt Reservoir dam was under construction, limiting reservoir capacity to 60%. The dam embankment was reconstructed, and toe drain pipes and concrete inspection wells were installed.



View of Mount McLoughlin from Hyatt Lake Recreation Area

Current Areas of Focus

Ecological Restoration

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. Monument staff were 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.

Legacy Fence Removal



Legacy fencing removed from SMW by youth crew

A WorkSource Oregon Youth Crew (formerly the Job Council) worked for approximately one week to remove four-strand legacy barbed wire fence from within the Soda Mountain Wilderness on the Skookum Creek Ridge/Keene Creek Ridge drift fence. A total of 1.5 miles of fence were removed. The WorkSource Oregon Youth Crew experience provides natural resource employment opportunities and experience for underserved youth throughout Oregon.

Aquatic Habitat Improvement in Keene Creek

Keene Creek supports populations of native Jenny Creek redband trout (*Oncorhynchus mykiss*). The main objective of the large wood placement in this project was to increase channel complexity and stability, increase spawning and rearing habitat, pool formation, spawning gravel deposition, hiding cover, winter refugia, and low velocity areas. The secondary intent of the project was to improve hydrologic function of the floodplain of Keene Creek and to stabilize channel banks. The project involved the placement of 30-35 logs removed from the Hyatt Lake campground (for public safety) and trees from a Bureau of Reclamation Project at Hyatt Dam. The logs were placed at 6 sites in log jams that were keyed in to existing riparian trees.



Large woody debris placed in Keene Creek

Soda Mountain Wilderness Stewardship Plan

In 2017, work continued in the monument focused on implementing activities approved in the SMW Stewardship Plan (2012): land exchanges, land acquisition, additional work on 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 constructed and maintained to keep unauthorized livestock and feral horses out of the wilderness and monument, acquired lands to be restored, and fuels to be reduced in the wildland-urban interface. In 2017, a new cattleguard was installed on Copco Road to help keep unauthorized cattle out of the Soda Mountain Wilderness. 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 may identify additional roads outside of the SMW that need restoration work. Monument staff continue to explore possible ways to accomplish the remaining restoration within CSNM and SMW.

Pacific Crest National Scenic Trail maintenance.

In 2017, the Pacific Crest Trail Association (PCTA) and the Siskiyou Mountain Club cleared downed 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. The monument issued two SRPs in FY 2017. One SRP was issued for a one-day bike event on the Cascade Siskiyou State Scenic Bikeway. The second SRP was issued for a one-day equestrian endurance ride within the monument. Both of these activities were determined to further the monument's mission of biological diversity and promote appropriate use within the monument.

Education, Outreach, and Interpretation

FY17 was a banner year for CSNM's interpretation, education and outreach program. CSNM hosted three new programs – Artist in Residence (AiR), Teacher on Public Lands (TPL) and Interpretive Park Ranger interns. In addition, CSNM's *Fall in the Field* program received *Hands on the Land* (HOL) program designation and continued its robust program partnerships.

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

New Programs

Artist in Residence – CSNM's inaugural AiR program was announced February 2017. Three AiRs were selected from an applicant pool of visual artists. All three selectees were local artists – Darlene Southworth, watercolorist, was selected for June; Mabrie Ormes, acrylic painter, for July, and Matt Witt, fine art photographer, for August. All three artists held public events and even completed a joint showing of their work at the Ashland Artists Gallery on Labor Day weekend 2017.

The program was an overwhelming success and will continue in 2018.



Teacher on Public Lands – CSNM's first-ever TPL program was announced March 2017. A local 3rd grade teacher, Tara O'Malley, was selected. Tara is a teacher at Table Rock Elementary school in White City, OR. More than 70% of Table Rocks' students are eligible for free and reduced lunch and more than 50% are identified as Hispanic or Latino.

During the summer, Tara jumped right into an introduction to the BLM and CSNM by shadowing several specialists in their jobs. Tara also spent several days at the monument seeing how the park rangers performed their jobs firsthand.



Tara O'Malley, CSNM Teacher on Public Lands 2017

Tara's TPL project was the creation of several CSNM lesson plans to introduce all students at Table Rock Elementary to the monument. The lesson plans included an introduction to the Bureau of Land Management and CSNM in particular. All activities were hands-on and utilized different engagement modalities. Tara has already implemented her TPL lessons in the classroom, and completed her requirements for university credit.

Interpretive Interns – CSNM selected three interpretive park ranger interns from a robust pool of applicants from Southern Oregon University's Environmental Education M.S. program. The park ranger interns staffed the CSNM information station, performed roving interpretation along CSNM's trails and provided interpretive programs at the campground and along the trails.

Interpretive Interns – CSNM selected three interpretive park ranger interns from a robust pool of applicants from Southern Oregon



Ranger intern Elizabeth with Oregon governor Kate Brown



CSNM Ranger interns Becky, Morgyn, and Elizabeth

Hands on the Land – now in its 8th year, *Fall in the Field* is a partnership program between CSNM and Southern Oregon University's graduate program in environmental education. This year, the *Fall in the Field* program was recognized as a *Hands on the Land* (HOL) program. HOL is a national network of field classrooms and agency resources to connect students, teachers, families, and volunteers with public lands and waterways.

Education

Pinehurst School – in spring of 2017, CSNM provided both in-class and field trips to the Pinehurst School. Pinehurst is a K-5 school that is located within CSNM boundaries. It is an

old-fashioned, community school located more than 20 miles from the nearest community. Over the years, the Pinehurst School and CSNM have developed a unique relationship.



CSNM winter programming at Pinehurst School, located inside the monument boundary

Fall in the Field Program – during the fall 2017, graduate students in Southern Oregon University's M.S. program in environmental education provided 7 weeks of curriculum-based education programming in CSNM. The program developed by the graduate students this year was focused on exploring interdependent relationships in ecosystems and discovering the unique biodiversity that makes the CSNM such a special place. Nine kindergarten through 2nd grade classes explored and observed the range of habitats at the CSNM. They discovered how unique habitat influences species diversity.

Twenty-eight 3rd through 5th grade classes explored important interdependent relationships on the CSNM by solving "Nature's Mysteries" as they hiked on the Pacific Crest Trail. From dissecting Speckled Oak Galls to becoming a Pileated Woodpecker, students became immersed in the monument's diverse life.

Four 6th through 8th grade classes used data collection methods to discover how abiotic and biotic factors influence ecosystems. On one trail, they were able to identify four different ecosystems and examine how this influences the biodiversity at the CSNM.

Three 9th through 12th grade classes took on the role of either a rancher, a wildlife biologist, or a forester and used data collection methods to explore the issues of land-use debates and conservation of resources. Students were challenged to develop their own land ethic as they learned about biodiversity in the Cascade-Siskiyou Bioregion.

More than 1,100 students plus teachers and chaperones were served during this year's *Fall in the Field* program!



Fall in the Field students and instructors, Hobart Bluff, CSNM 2017

Friends of Cascade-Siskiyou National Monument

Friends of Cascade-Siskiyou National Monument continue to be a strong partner. In FY17 FCSNM offered a full suite of education outreach programs, conducted two BioBlitzs in the monument, held a student science symposium, and participated in many community events.

Hike and Learn – FCSNM completed another successful season of Hike and Learn offerings. CSNM staff help facilitate this series by attending both the Friday evening lecture and the all-day Saturday field sessions. There were eight program offerings from May through September. Topics included CSNM botany, pyrodiversity, vistas and viewpoints, and cultural history.



Hike and Learn botany participants – CSNM Horseshoe Ranch, CA

Fungi BioBlitz – More than 120 different species of fungi - nearly 3 times the number found in a previous survey - were uncovered during the CSNM BioBlitz in November 2016. The

Friends of CSNM corralled citizen scientists, including high school and college students, volunteers, and fungi experts for this huge event. Several truffles and the rarely found species *Ramaria celevirescnes*, *Blavulinopsis fusiformis*, and *Stropharia kaufmanii* were identified.



Inky Cap Mushrooms by volunteer Peter Schroeder

Herpetology BioBlitz – In May, more than 70 eager citizen scientists explored nine different sites in CSNM looking for herpetofauna (reptiles and amphibians). The groups recorded 18 species including 5 lizards, 6 snakes, 1 turtle, 3 salamanders and 3 frogs. The Western Fence Lizards accounted for 76% of all observations and were found at all nine locations. As with all BioBlitzes this event provides a basis for future surveys and focused research into the biodiversity in CSNM.



Alligator Lizard found in Oregon Gulch area



Family group looking for herps, Boccard Point

Outreach

CSNM Greensprings Community Meet and Greet – on Saturday April 8th, from 3-5pm, CSNM staff held its first-ever community meet and greet with approximately 50 Greensprings area residents. Greensprings is the closest “gateway” community to the monument and this was an opportunity for residents to find out what is going on in the monument – each staff member introduced themselves and their program – and to mingle and ask questions.



CSNM Meet and Greet meeting introduction

Community Events – CSNM participates in a variety of area events each year. This is an important opportunity for monument staff to interact with the public and provide opportunities for the public to make connections with monument resources. Below is a list of some of the 2017 events:

- **Sportman’s Show**, Jackson County Expo, Central Point, OR – 3-day event in February, 700+ contacts
- **Student Science Symposium**, Southern Oregon University campus, Ashland, March – 90+ contacts
- **Earth Day Festival**, ScienceWorks Hands-On Museum, Ashland, OR, April – 332 contacts
- **Free Fishing Day**, Hyatt Lake Campground, CSNM, June – 150 contacts
- **August Institute Teacher Fair**, Jacksonville OR, August, – 130 contacts
- **Bear Creek Salmon Festival**, North Mountain Nature Park, Ashland OR – 150+ contacts



Free Fishing Day at Hyatt Lake



Earth Day at ScienceWorks in Ashland

Partnerships

Friends of Cascade-Siskiyou National Monument



CSNM Friends Group Hike and Learn participants, Grizzly Peak Trail

The Friends of Cascade-Siskiyou National Monument (FCSNM) continues to be a strong and important partner of the monument. FCSNM hired its first paid, part-time staff member this year. Shannon Browne was hired in April to be the Director of Community Partnerships. The Friends Group continued its activities including its *Hike and Learn* series, student research grants and symposium, the community symposium, fundraising events and two BioBlitz events. 2017 was a record-breaking year for the Friends Group – donations

were at an all-time high, as well as participation in Friends' events.

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 seventh successful year, the week-long 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 2017, 50 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

Siskiyou Mountain Club

The mission of the Siskiyou Mountain Club (SMC) is to restore, maintain and promote primitive backcountry 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 2017, 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

Southern Oregon Nordic Club (SONC)



Nordic Skiers on CSNM groomed ski trails

groom trails within the Nordic Ski Area System. SONC also assisted the BLM with winter trail maintenance.

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

Free Fishing Day



The free pancake breakfast on free fishing day fed many hungry anglers

On June 5, 2017, BLM partnered with US Forest Service and United Hunters and Sportsmen Association and hosted a free fishing day event in CSNM at Hyatt Lake, drawing nearly 100 people. The United Hunters and Sportsmen Association provided a free pancake breakfast to all participants.

Other Volunteer Activities

Other volunteer activities include individuals who donate their time for trail maintenance, species monitoring, and outreach activities.



Free Fishing Day at Hyatt Lake in the CSNM



Volunteers clearing the Pacific Crest National Scenic Trail

Land (or Interests in Land) Acquisitions



View from Pacific Crest Trail in Mountcrest parcel

In 2017, work continued on land acquisition efforts. The 314-acre Mountcrest parcel was purchased in 2017 with the assistance of the Pacific Forest Trust. This parcel adds two segments (0.7 miles) of the Pacific Crest Nat'l Scenic Trail to the monument. The ongoing success of the land acquisition program is due to the dedication of District, State, and Washington Office BLM staff and many partners who have helped through the years.

4 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: 2017 Science, Monitoring and Inventory Programs**.

2017 Science Highlight – Cascade-Siskiyou NM Science Symposium

In collaboration with the BLM, the Friends of Cascade-Siskiyou hosted a Monument Research Symposium on March 23rd at Southern Oregon University. This event featured presentations of current research projects in the CSNM from university researchers, non-profits, and agency personnel from around the region. The 2017 event was attended by more than 80 people, and presentations included the following: three graduate student research presentations on the geology of the monument by Martin Harris (University of Oregon), Kieran McCann (University of Oregon), and Kendra Madaras-Kelly (Southern Oregon University); a presentation on the research of the movement of the endemic fish,



Scott Loring, Fungi BioBlitz hike leader

the Jenny Creek sucker, by Chris Volpe, Fish Biologist, Medford BLM; a discussion of the ecology of Great Grey Owls by Emily Burke, a graduate student at Southern Oregon University; a presentation of the results of the 2016 Fungi BioBlitz by Scott Loring of Pacific Crest Consulting; and a presentation by Dr. Michael Parker of SOU about research needs within the monument. 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 (SOU) staff and students multiple times to improve cooperative research relationships focused on the CSNM and share research interests and opportunities. The CSNM ecologist has been invited to be an adjunct faculty member so that he can more easily participate in university science activities and planning meetings. One plan is to collaborate with the university to set up a multi-agency research lab on campus where regional research projects can be shared with faculty and students.

Another idea is for the CSNM ecologist to work with SOU faculty members to design and implement experiential research and resource management field activities for crews made up of students from various classes, such as Forest Ecology, Restoration, Ecology, Botany, etc. An offshoot plan may be to develop an ecological restoration certificate program in conjunction with SOU and other institutions, like the University of Nevada, Las Vegas, where students get classroom training at their university and perform restoration research or activities within the monument.

Research Projects

Plantation Treatment Research

The CSNM entered into a multi-year Cooperative Agreement with Dr. Scott Abella of the University of Nevada, Las Vegas, to study the effects of various thinning treatments on six 40-60 year old plantations that are scattered throughout the monument. The monument has at least 70 of these plantations that range in size from 10 to 30 acres.



Researcher at Plantation Site in CSNM

It is a high priority to determine effective thinning treatments that will push these plantations toward an ecologically healthy late seral stage forest, and at the same time improve soil conditions and create wildlife habitat for encouraging the natural biodiversity of the areas. Dr. Scott Abella and his technicians have visited the sites and have mapped and set up long-term monitoring plots for tracking changes over time. They will work with monument staff and Lomakatsi Restoration LLC to plan prescriptions for the different treatments. Compliance for this project is expected to be completed in the spring of 2018. Pine plantation treatments are tentatively scheduled to begin in May, 2018.

Status: Study plots have been established. Prescriptions will be developed by January, 2018, and compliance should be complete by May, 2018.

Oregon Spotted Frog

On August 28, 2014 the USFWS listed the Oregon Spotted Frog (*Rana pretiosa*) 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 and expanded. 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.

Dr. Michael Parker of Southern Oregon University has been collecting data on this species for the past 15 years. He presented a paper (with two student co-authors) at the Northwest Science Association annual meeting in March 2017 based on this work. The CSNM is supporting this work and financing some habitat enhancement and eDNA research in possible habitat throughout the CSNM.

Status: awaiting final report (Southern Oregon University, Dr. Michael Parker, Biology).

eDNA Amphibian Research

CSNM is working with Dr. Michael Parker of Southern Oregon University to use a new technology, eDNA, to survey for native amphibians in the monument. Of particular interest is the Oregon Spotted Frog (*Rana pretiosa*) and the Cascades Frog (*Rana cascadae*). Monument staff will be selecting specific watersheds for collecting filtered water samples, and sending these to a eDNA lab to identify if these species are present.

Status: Expect final report in December 2017. (Southern Oregon University, Dr. Michael Parker, Professor Emeritus).

Breeding system evaluation for Fritillaria gentneri in CSNM

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: A final report was completed in December, 2016 (Amsberry and Meinke 2016).

Bumble bee Survey

Dr. Robin Thorp of the University of California, Davis, led a bumble bee "blitz" to search for rare bumble bees of special concern: Franklin's Bumble Bee, *Bombus franklini*, and

the Western Bumble Bee (*Bombus occidentalis*). This event was organized by Dr. Thorp and USFWS Portland office personnel for July 17-21, 2017. The first 2 days were spent on Mt. Ashland, where eight bumble bee species were found but no special concern



bumble bees were observed. The last days were spent in the monument where participants encountered eight species of bumble bees, but did not observe any of the rare bumble bees. The following bumble bee species were found at Hobart Bluff trailhead area in the CSNM: *Bombus mixtus*, *B. vosnesenskii*, *B. flavifrons*, *B. appositus*, *B. californicus*, *B. griseocollis*, *B. flavidus*, and *B. insularis*.

Status: Blitz conducted on July 17-21, 2017 (UC Davis, Dr. Robbin W. Thorp, Professor Emeritus, Entomology).

Jenny Creek Sucker Movement Project

Jenny Creek suckers were collected and tagged at multiple locations in the mainstem of Jenny Creek during base flow conditions. This was the final year of this study. In total, 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 2016-17 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. No spawning suckers 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. In the spring of 2016, with cooperation from Oregon Department of Fish and Wildlife (ODFW) biologist Bill Tinniswood, the Fredenburg reach of Jenny Creek was sampled for suckers that appeared to be infected with the suspected parasite *Ligula intestinalis*. This species was also found in the Box O area. Four suckers were euthanized and sent to the ODFW Corvallis research lab for autopsy.

In 2017 CSNM continued to operate the PIT tag antennas, and had four detections of migrating fish this spring/summer, which was a record. The Ashland Resource Area fish biologist, Chris Volpe, provided a number of public presentations, including:

1. A presentation to the Jefferson Fish Society, which presented the pit tagging/population estimate study findings;
2. A presentation to the CSNM research symposium in March 2017, where he presented a history of all the research done on JCS;
3. A science symposium where Dave Herring (partner at Crater Lake National Park) and Chris presented a poster highlighting the pit tag and population estimate work;
4. A kids hike and learn event in mid-September, where Chris showed elementary school children how to e-fish, and how to identify different fish and macro invertebrates; and
5. An adult hike and learn program through the Friends of Cascade-Siskiyou National Monument the following week presented by the hydrologist and fish biologist discussing the watershed, the species of interest, and BLM's restoration program.

Status: 2017 was the 4th and final year of field data collection. (*Medford BLM, Chris Volpe, Fish Biologist*)



Shocking Fish in Jenny Creek with students from Lincoln School

Forest Dynamics Project

The CSNM is collaborating with Phillip van Mantgem, Research Ecologist, US Geological Survey, in a regional long-term research project 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). For the study, 17 large one-hectare

forest plots were established to gather detailed forest structure data that will place forest patterns and dynamics within the context of 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 assist in understanding 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. None of the plots within CSNM were visited in 2017.

*Status: Study plots established, field data collected, revisits every 5 years.
(USGS, Phillip van Mantgem, Research Ecologist)*

Hypogeous Fungi Survey

This project is a 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. An additional project proposal was funded in 2014 to: 1) clarify characteristics that distinguish rare species from common ones; 2) correlate morphological and molecular data from recent collections; and 3) 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).

Acoustic Monitoring of Old Growth Forest Avian Species

The CSNM entered into a multi-year Cooperative Agreement with Dr. Stuart Janes of Southern Oregon University and a graduate student to record all bird calls at various old growth forest areas throughout the monument. All calls will be identified by species, and information such as number, frequency, and time of day will be analyzed.



Acoustic Monitoring Equipment Setup

Avian species, such as the Northern Spotted Owl and Pileated Woodpecker, will be captured along with other bird and mammal species. This research will aid the CSNM staff in understanding the inhabitants of old growth forests and how to effectively restore wildlife habitat in a number of plantations that will be treated for developing late seral stage forests and appropriate wildlife habitat.

The CSNM ecologist collected acoustic data from eight separate old growth sites within the monument. Stations were in place for a minimum of two weeks and all sounds

during that period were recorded with date and time stamps. Data has been sent to SOU researchers for analysis and reporting. In 2017, CSNM worked with SOU, through a multi-year Cooperative Agreement, which provides educational and research experience for graduate and undergraduate students.

Status: Expect final report in December 2017. (Southern Oregon University, Dr. Stuart Janes, Professor).

Pika Vocalization Research

CSNM is working with the Friends of the Cascade Siskiyou Monument and a graduate student at Southern Oregon University to search for pika (*Ochotona princeps*) locations within the monument and record their calls for comparison with other regional



SOU Researcher listening for Pika



Pika found in CSNM

populations. This is research to see if the different call dialects can be used to ascertain historic connections between populations. The Friends of the CSNM helped fund a graduate student at Southern Oregon University for this project. A final report and presentation is due in early 2018.

The CSNM ecologist accompanied the researcher in the field and set up an acoustic monitoring station and wildlife camera at the primary site within the monument. Data for a week of sound was collected and is being analyzed by researchers at SOU. The wildlife camera also captured a photo of one of the pikas within the CSNM.

Status: Expect final report in early 2018. (Southern Oregon University, Dr. Michael Parker, Professor Emeritus).

Dragonfly and Damselfly Survey of CSNM

CSNM is working with the Friends of the Cascade Siskiyou Monument and a graduate student at Southern Oregon University to survey for dragonflies and damselflies at specified locations throughout the monument. This is research to determine the diversity of this insect group within the monument and to examine the habitat types preferred by different species. The Friends of the CSNM helped fund the graduate student at Southern Oregon University for this project. A final report and presentation is due in early 2018.



Researcher surveying for damselflies

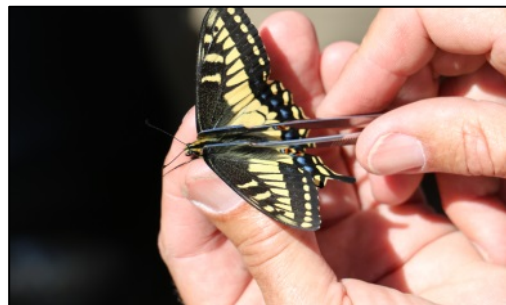
Status: Expect final report in early 2018. (Southern Oregon University, Dr. Michael Parker, Professor Emeritus).

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.

Lepidoptera Monitoring

The CSNM entered into a multi-year Cooperative Agreement with the Xerces Society to develop a Lepidoptera (butterflies and moths) monitoring plan for the monument. The initial funding will be used to develop a long-term monitoring plan and protocols for the monument that can be used with volunteer and educational groups. If additional funding becomes available, the Xerces Society can provide professional entomologists for collecting data.



*Anise Swallowtail (*Papilio zelicaon*) caught in CSNM during butterfly survey.*

The CSNM ecologist has been working with Dana Ross, a local lepidopteran expert, to develop a plan and protocol for monitoring moths throughout the monument. Monument staff will be testing some protocols and potential monitoring sites in 2018.

Status: Anticipating first report in March 2018. (Xerces Society, Portland, Oregon).

Vegetation Monitoring

The CSNM is working to establish long-term vegetation monitoring plots using regional



Volunteers reading vegetation plots

vegetation monitoring protocols developed by the National Park Service. Only one permanent plot was established in 2017 with a volunteer school group. This is an important part of our long-term monitoring program because vegetation changes have such widespread effects throughout the ecological systems. The plan is to spend the next several years establishing permanent plots and collecting as much data as possible. Once the plots are in place, a professional botanist could be employed to visit the sites and collect data.

Status: Expect first report in December 2018. (CSNM Ecologist, Charles Schelz).

Lichen and Moss Monitoring

In 2017, the CSNM Ecologist located and set up lichen monitoring sites within the CSNM. Sites are specific areas where a diversity of lichens and mosses have been encountered in the field. Monitoring is focused on rocks, trees, soil, and downed and rotting wood. In 2017, locations of six sites have been documented and detailed photos taken. More thorough surveys of each site will be undertaken in 2018 with accurate identifications and measurements of the extent of specific species on different substrates. Monitoring protocols will be formalized in 2018. The CSNM Ecologist has been in contact with the Northwest Lichenologist Society and is hoping to organize a multi-day volunteer inventory event in 2018.



Lichens on tree in CSNM

Status: Expect first report in July 2018. (CSNM Ecologist, Charles Schelz).

Avian Monitoring

In 2017, the CSNM ecologist worked with the Klamath Bird Observatory (KBO) to be ready to implement bird monitoring in the monument using established protocols for the region (National Park Service 2012). This planning is in anticipation of future funding and sets the stage for acquiring help with establishing plot locations, establishing plots, and data collection. KBO has extensive experience with the established protocol and is ideally suited to not only analyze long-term monument avian trends, but also to use their extensive experience and networks to analyze for regional trends through its collaboration with other agencies and private organizations. A Cooperative Agreement is ready for implementation but no plots have been established at this time.

Status: Inactive, pending funding availability

Fisher Monitoring

The CSNM Ecologist set up a multi-year Cooperative Agreement with fisher researchers at Oregon State University (OSU) with the intent of continuing the collar monitoring work they have been doing for the past five years in the region. The OSU team has extensive experience with developing, implementing, and analyzing non-invasive survey methods for carnivores. They direct the Klamath-Siskiyou Carnivore Project in collaboration with the USFWS Yreka field office where they have been surveying for fisher and other mesocarnivores noninvasively since 2006. They currently have a manuscript in review addressing the interactions between fisher, fox, and ringtail. They are also working on another manuscript addressing the impacts to fisher of mixed-severity fire and salvage logging.



Fisher in CSNM

Funding for the initial research within the CSNM and the region has ended. Monument staff are searching for new funding sources to continue this work. Since a number of animals currently have functional collars, it would be very cost effective to collaborate on this project. The OSU team is especially interested in moving forward with a logical extension of the initial research and propose a scope of work in the following phases: to 1) develop a database of past and current fisher survey effort and trends; 2) develop a monitoring protocol for fisher and the larger mesocarnivore community within the CSNM; and 3) implement the protocol with future funding.

Status: Inactive, pending funding availability

Pond Turtle Monitoring

Worldwide, about 50 percent of all freshwater turtle species are considered threatened, more than any other animal group (Turtle Taxonomy Working Group 2014). Oregon's two freshwater turtle species, the western painted turtle and the western pond turtle, are identified as priority at-risk species in the Oregon Conservation Strategy (OCS), Oregon's Wildlife Action Plan and statewide framework for conserving fish and wildlife species (ODFW 2006).

Status: The CSNM Ecologist is working with a multi-agency task group to develop protocols for monitoring pond turtles in the region. Once protocols are established, sometime in 2018, the Ecologist will initiate monitoring at known sites within the monument.

Oregon Spotted Frog

Dr. Michael Parker of SOU monitors the Oregon Spotted Frog each year in early spring when the frogs are reproducing and their eggs are evident. He has been monitoring the population in CSNM for about 15 years. The population counts, based on the number of egg masses found, have varied over the years from zero to over 10. This monitoring occurs in the Parsnip Lakes area of the monument. As a result of this monitoring, it has been determined that wetland restoration improvements at one of the primary sites at Parsnip Lakes would be beneficial to this species. CSNM is working with the FWS and SOU to plan restoration activities for creating additional habitat for this species.



Surveying for Oregon Spotted Frogs

Wildlife Monitoring Using Photography

Wildlife monitoring cameras have been set up at various locations throughout the monument. These cameras are typically mounted on trees along wildlife corridors in



Wildlife Camera Setup in CSNM

order to keep track of the different species within various vegetation types in the monument. In 2017, monument staff focused on old growth forests and set up cameras for 2 weeks at a time. Initial results have shown only common species, but efforts continue to fine-tune site selection and a more concerted and coordinated monitoring effort will occur in 2018. A part of this project will involve the mapping of wildlife trails or corridors within the

monument. Once these are located, a focused effort to document wildlife species will begin in 2018.

Aquatic Ecosystems: Hydrology and Habitat Monitoring

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 streamflow events at 15 sites within the CSNM as opportunities arise.

In 2017, the Ashland Field Office hydrologist continued with stream temperature data collection at 17 sites in the CSNM (about half of those sites have summer data collection, the remainder have year-round data 30 minute interval), p1 precipitation recording station, a stream gaging station on Jenny Creek, and re-survey of 4 stream channel cross-sections on the former Box O Ranch. The cross sections are sites established in 1996 to monitor long term channel changes at various locations in response to the removal of grazing and vegetation recovery.

Bureau Sensitive Species Update:

Peregrine Falcons – In 2017, agency biologists conducted monitoring of nesting peregrine falcons (*Falco peregrinus anatum*) on Pilot Rock. Peregrine falcons were removed from the U.S. Fish and Wildlife Service 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 – The CSNM Ecologist and BLM biologists serve on the Interagency Special Status/Sensitive Species Program (ISSSSP) working groups for the Mardon skipper helping to design projects and monitoring efforts. The CSNM Ecologist set up a multi-year Cooperative Agreement with the Xerces Society to help develop monitoring protocols for these species.

Oregon Spotted Frog – Dr. Michael Parker of Southern Oregon University is assisting with the study of the Oregon spotted frog, a Federally-listed Threatened species. Through Challenge Cost Share projects and his own efforts, Dr. Parker is assisting the BLM in the study of 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. Site Management Plan development and site restoration planning have gained momentum in 2017 with the BLM, USFWS, and Dr. Parker joining forces to carefully strategize the most effective and least impactful means of enhancing habitat in the Parsnip Lakes complex within the CSNM. Among the planned investigative tools is species surveillance through the use of eDNA (environment DNA) detection.

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.

Gray Wolf - Gray wolves have re-colonized Southwestern Oregon in recent years. Confirmed sightings of Gray Wolves have been documented within the CSNM (including GPS locations gathered from the collar worn by male wolf OR-7 and other collared individuals). 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 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 year-round residents of the CSNM.

Fisher - (*Pekania pennanti*) - The Fisher, a member of the weasel family, is a Bureau Sensitive Species and has 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 coniferous forests, large snags, decadent live trees, logs, and complex physical structure near the forest floor for denning and resting sites. The mean home range for females is 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.



Fisher in CSNM

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

Northwestern Pond Turtle - BLM continues to monitor the known pond turtle sites. Data collection on population size and age structure continues. Renewed interest in the status of Western Pond Turtles has led to the formation of a Southern Oregon/Northern California Chapter of Oregon Native Turtle Working Group. Participants include ODFW, BLM, USFS, USFWS, USGS, and NGOs. Monitoring of known pond turtle sites is anticipated to increase over the next few years. Data collection on population size and age structure will be the

primary goal. The largest known population of Western Pond Turtles in the CSNM is in the Jenny Creek system.

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 fritillary locations and in the Mariposa Preserve (Greene's Mariposa Lily), which results in improved habitat for these species.



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. For FY 2017, noxious weed treatments continue in the monument, primarily in these areas:

- Mariposa Lily Botanical Area: treated 174 acres of mostly yellow starthistle, with cutleaf teasel and dyer's woad.
- Soda Mountain/Hobart Lake Focus Areas: treated 18 acres of Canada thistle.
- I-5/Old Highway 99: treated 45 acres of mostly dyer's woad, with some spotted knapweed.
- Pilot Rock Fritillaria Management Area: treated 4 acres of yellow starthistle and dyer's woad.
- Box O Focus Area: treated 159 acres of mixed weeds, mostly yellow starthistle.
- Box O: treated 130 acres of yellow starthistle.
- Copco Road: treated dyers woad and bull thistle.
- Scattered small infestations throughout the monument: treated 11 acres of various invasive plants.



Volunteers pulling star thistle in CSNM

Dyers Woad Control and Mapping

The Ashland District botanist and CSNM Ecologist spent time in August controlling the aggressive noxious weed Dyer's woad (*Isatis tinctoria*) along Copco Road at the eastern boundary of the monument. The recent fires in the area have created a favorable environment for this weed, but the population has not exploded yet, and work by the

BLM has so far prevented additional spread. All mapped individuals and populations were dug up and bagged for disposal outside the monument.

Plantation Treatments

CSNM staff are working on NEPA compliance to treat about seven plantations in the monument that range in age from 40-60 years old. In 2017, the Ecologist held two public field trips, one with local forestry experts, and the other with the general public to discuss this project. These original seven plantations are meant to be prototypes for testing varying degrees of treatment with the primary aim of kick-starting these areas toward rapid growth to late seral stage and eventual old growth. Treatment ideas to encourage biodiversity and habitats for wildlife while protecting soil health are being explored by the BLM with input from the public. The re-introduction of the natural fire regime is another top priority goal. The early results of these different treatment types will be carried forward in the eventual treatment of many of the 70+ remaining plantations in the monument.

The NEPA process was initiated in early 2017. Prescriptions and experimental design for each of the seven plantations will be developed in January 2018. Hopefully, treatments can begin in spring of 2018.

Prescribed Fire and Wildland Urban Interface

The CSNM Ecologist initiated work with BLM fire specialists and area fire ecologists to help the CSNM staff to develop effective and safe fire management plans for using prescribed fire at many of our treatment areas. All plans will have the primary goal of re-establishing the natural fire regime and of scientifically developing areas of high natural biodiversity.

In 2017, the Ecologist visited with three of the monument neighbors who own homes adjacent to the monument border to listen to their concerns regarding the wildland urban interface. He is developing relationships that will encourage working together toward the programs goals. He has also met with the Nature Conservancy and other local fire planning partners and will continue to collaborate in the future.

BioBlitz: Fungi

This BioBlitz occurred in November 2016. The event aimed to engage local community members in citizen science data collection and to improve knowledge of rare and sensitive fungi found in the Monument. Additionally, this event increased public awareness and appreciation for the incredible biodiversity present in the Cascade-Siskiyou National Monument. Both goals were achieved, as the group's efforts uncovered over 120 different species of fungi (nearly 3 times the number found in a previous survey) including several truffles



Dr. Darlene Southworth describes a fungi on BioBlitz

and the rarely encountered species *Ramaria celevirescens*, *Clavulinopsis fusiformis*, and *Stropharia kaufmanii*.

BioBlitz: Herps

The Friends of CSNM organized a bioblitz for herps (amphibians and reptiles) in May 2017. Over 80 participants spread out to different areas of the monument to search and record



Herp BioBlitz participant with Western Fence Lizard

herps they encountered. The Bioblitz was a class project for Dr. Parker's Herpetology students and they spent several days with him in the field learning about habitats and herp identification, and doing reconnaissance for the blitz. Each of the eight teams was led by two student "experts." The teams observed 18 species, including 5 lizards, 6 snakes, 1 turtle, 3 salamanders and 3 frogs. The most widespread species was the Western Fence Lizard that accounted for 76% of all observations and was found at all nine locations. Racers, Southern Alligator Lizards and Western Skinks

were also frequently encountered, occurring at 7-8 of the 9 sites surveyed. The three least common species encountered were the Striped Whipsnake, Western Pond Turtle and Boreal Toad, each represented by a single individual at a single site. This initial inventory that was collected at the BioBlitz will now provide the basis for future surveys and focused research into biodiversity on the Monument, all of which is essential for its protection.

Butterfly Survey

There were two butterfly surveys in 2017. The first was organized by a local pollinator group based in Ashland, Oregon. Led by volunteers, the group split into three subgroups of about six participants each and surveyed different areas of the monument. The group identified a total of 76 species.

The second survey, led by Dana Ross, lasted for about three days and was part of a class hosted by the Siskiyou Field Institute based in Selma, Oregon. A list from this survey has yet to be released, but the instructor and students worked closely with the CSNM Ecologist to select locations for the surveys.



Volunteers on butterfly survey

A number of the sites surveyed by both groups will become part of the CSNM Long-term Lepidoptera Monitoring Program. The data collected will be incorporated into the long-term database for each site. The Xerces Society has entered into a 5-year Cooperative

Agreement to plan the location of monitoring sites and develop protocols for long-term lepidoptera monitoring in the CSNM.

Pollinators

The CSNM Ecologist had several meetings with The Pollinator Project Rogue Valley to encourage their activities and to brainstorm ways to get the monument involved in collaborating with their pollinator efforts. The group is interested in creating a series of gardens for a connected pollinator flyway through the Rogue Valley and would like to see it continued up into and through the monument. They already have a number of communities throughout the Rogue Valley committed to their goal of spreading education and pollinator gardens throughout.



Pollinators within CSNM



Pollinators within CSNM

The CSNM Ecologist will be working with this group to analyze appropriate pollinator habitat to create a cohesive flyway through the monument that connects directly with the Rogue Valley. Additional work is required to plan noxious weed control and pollinator vegetation restoration projects designed to attract and support a suite of pollinators throughout the region.

Oregon Extension

CSNM staff met with Oregon Extension, an organization/school based in Lincoln, Oregon, within the monument. This is an experiential education and research organization that is very interested in working with monument staff on various ecology projects. The Ecologist set up a Cooperative Agreement that will serve as a vehicle to work with Oregon Extension and their students in the near future. The CSNM Ecologist spent time in the field with Oregon Extension staff and researchers and has been able to get them involved in soil testing at some of our plantation treatment sites. We anticipate future collaboration on various ecology projects throughout the monument.

Watershed Analysis Study

The CSNM Ecologist assembled a proposal to fund a hydrologic study of the monument. This is a CSNM high-priority need, and would involve an analysis of the watersheds of the monument and future water quality, quantity, and needs. All past water quality and quantity monitoring will be collated and analyzed, and different watersheds will be examined for data needs and recommended future work. This information will form a foundation for dealing with future water rights issues. This



Jenny Creek watershed meadow

project is important for the monument because there has never been a comprehensive study for the area that incorporates all the past work accomplished in the CSNM.

The CSNM Ecologist contacted a number of researchers interested in this project, with the plan to support a PhD student for 2-3 years. The Ecologist will be working with university researchers and searching for new funding sources in 2018.

Volunteer Activities

1. ***Klamath Siskiyou Wildlands Center (KS Wild) – Ashland, Oregon***
 - a. ***Noxious weed group:*** The CSNM Ecologist worked with KS Wild and a group of volunteers to control starthistle (*Centaurea solstitiensis*) in the Mariposa Botanical Area of the monument. This area has been visited by this group for at least the last three years and the effectiveness of returning every year is beginning to show in treated areas.
 - b. ***Plantation Clumps and Stumps:*** The CSNM Ecologist worked with KS Wild to locate, identify, and measure old stumps in one of the plantations that will be treated in the near future. This information helps the Ecologist plan a treatment prescription for creating natural clumps of trees.

2. ***Cascades School of Central Oregon – Bend, Oregon***
 - a. ***Plantation Clumps and Stumps:*** The CSNM Ecologist worked with the Cascades School science teachers to locate, identify, and measure old stumps in one of the plantations that will be treated in the near future. This information helps the Ecologist plan a treatment prescription for creating natural clumps of trees. This project also provides important experiential and educational ties to the ecology of our forests.

3. ***Science High School Class – Medford, Oregon***
 - a. ***Long-term Vegetation Plots:*** The CSNM Ecologist worked with outdoor educators and this special science program to provide the opportunity for the class to establish one of our long-term monitoring plots within the monument. Students helped locate the plot, set permanent markers, count and measure trees and shrubs, and photograph plot sections. This plot is the first of many that will be established throughout the monument in the coming years that are designed to measure long-term vegetation trends.

4. ***Siskiyou Field Institute, Selma, Oregon***
 - a. The CSNM Ecologist worked with Dana Ross, an instructor with the Siskiyou Field Institute, to organize butterfly surveys in areas throughout the



Students reading vegetation transect

monument in July, 2017. The Ecologist met with the group and participated in most of the surveys over the course of three days.

5. *Public Lands Field Day*

- a. CSNM staff planned a National Public Lands Day project controlling star thistle in the Greensprings Trail area for an area slated for restoration to native grassland. The project was planned and advertised, but unfortunately was cancelled due to the hazardous levels of wildfire smoke in the project area in early September. This project will be rescheduled for 2018.

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 2018. Some of this monitoring will be new and some will be a continuation of programs already extant. 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 lands in 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 yields a more complete and holistic view of the overall regional condition and needs.



Emigrant Creek watershed 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 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 current plans and is meant to guide the CSNM into 2017-18 and beyond regarding monitoring efforts. It is also

intended as an informative narrative that readers can use to assess current and future monitoring efforts, and to provide specific feedback for future adjustments.

The following indicators are presented as a comprehensive list. Through 2018 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 that can be actively monitored will be a subset of this list, to be refined over the coming years, and dependent on available funding. The prioritization in **Table 1** indicates the ranked approach we will use as our overall guide in establishing a monitoring plan. Table 1 also has a list of indicators that we were able to start monitoring in 2017.

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 changes of one reverberates throughout the system creating additional anomalies. The vision of monitoring is to be able to foresee ecosystem degradation or trends early enough to make proactive management decisions that avoid further degradation and large-scale ecosystem harm. The earlier these trends are detected, the more effective we can be at management to restore and maintain ecosystems. The primary objectives of monitoring are:

1. To simply understand the natural systems better in order to more effectively preserve and protect them.
2. To gauge the general health of species populations and ecosystems according to the latest research and best known scientific knowledge.
3. 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.
4. 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.
5. To deliver 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.
6. To deliver 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.
7. To afford a way to measure progress toward achieving management goals.



Oak hillside in Soda Mountain Wilderness

Indicators Selected for Long-Term Monitoring

Indicators were selected from important elements of the monument described in the presidential proclamation, from concerns regarding future changing climatic conditions, and from the latest scientific research about important ecosystem drivers. They include biotic indicators, such as individual species populations and plant and animal communities and abiotic indicators, such as soil texture and chemical composition and water quality.

Table 1 is a list of 26 indicators that fall under 6 general resources, objects, and values (ROV) elements. These indicators were identified to be important measures of ecosystem integrity in the CSNM region. The following sections describe each element and provide a brief overview of the current status regarding monitoring and planning at CSNM. Also included is a list of stressors for each element, and a column to identify whether this monitoring is also occurring through one of our principal partners, the National Park Service’s Klamath Inventory & Monitoring Network.



Little Hyatt Lake

TABLE 1. Monitoring Indicators for Cascade-Siskiyou National Monument

INDICATORS	Priority	NPS	Procla- mation	Monitored in 2017
Rare and Endemic Plants				
1. Gentner’s fritillary (E) (<i>Fritillaria gentneri</i>)	4	N	Y	Y
2. Greene’s mariposa lily (G2) (<i>Calochortus greenei</i>).	11	N	Y	Y
3. Bellinger’s meadowfoam (SC) (<i>Limnanthes floccosa</i> ssp. <i>bellingermana</i>)	12	N	Y	N
Old Growth Emphasis Area Indicators				
4. Northern Spotted Owls (<i>Strix occidentalis caurina</i>)	10	N	Y	Y
5. Old Growth Birds (Pileated Woodpecker, Pygmy Nuthatch, Flammulated Owl, Western Bluebird, Western meadowlark)	6	Y	Y	Y
6. Fisher (<i>Martes pennanti</i>)	20	N	N	Y
7. Lichen Communities	23	N	N	Y
8. Habitat Connectivity and Fragmentation	7	N	N	N
Diversity Emphasis Indicators				
9. Riparian Health Assessment and Connectivity	9	Y	Y	N
10. Semi-Wet and Wet Meadows	13	N	Y	N
11. North American Beaver (<i>Castor canadensis</i>) Distribution	24	N	N	N
12. Oregon Spotted Frog (T) (<i>Rana pretiosa</i>) Population Trends	22	N	Y	Y
13. Freshwater Snail Diversity and Distribution	19	N	Y	N
14. Pollinators	18	N	Y	Y
15. Fish Distribution	21	N	Y	Y
Plant Communities				
16. Terrestrial Vegetation Monitoring Plots	1	Y	Y	Y
17. Special Plant communities: Rosaceous Chaparral and Oak-Juniper	14	N	Y	N
18. Grazing Impacts	15	N	Y	N
19. Forest Dynamics Study Plots (USGS Phillip van Mantgem)	5	N	Y	N
20. Non-native, Noxious, and Invasive Plants Mapping	2	N	N	Y
21. Non-native, Invasive Plants Early Detection	3	Y	N	Y
Soils				
22. Soil Texture and Chemical Composition	25	N	N	Y
23. Soil Biological Communities	26	N	N	N
Water Quality				
24. Water Quality	16	Y	N	N
25. Aquatic Connectivity	8	N	N	N
26. Aquatic Macroinvertebrates	17	Y	N	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. 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, and 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
112,928	37,055*	6,000*	4,000*

* For the remainder of this report, these three ROV acreages are based solely on the original monument and do not yet reflect the inclusion of the 2017 expansion area.

1. Gentner's fritillary (*Fritillaria gentneri*).
2. Greene's mariposa lily (*Calochortus greenei*).
3. Bellinger's meadowfoam (*Limnanthes floccosa* ssp. *bellingariana*); populations near Lincoln and one small occurrence in the Oregon Gulch RNA.

Other rare and endemic species:

- 1) California milk-vetch (*Astragalus californicus*); one population in the monument in the Scotch Creek Research Natural Area (RNA).
- 2) Tracy's peavine (*Lathyrus lanszwertii* var. *tracyi*); one population documented, also in the Scotch Creek RNA.
- 3) Clustered ladies slipper (*Cypripedium fasciculatum*); one existing monitoring plot.
- 4) 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. In 2017, only Gentner's fritillary was monitored within the monument, and this was

accomplished primarily by the Oregon Department of Fish and Wildlife (ODFW). No funding is available for rare plant monitoring at this time. The CSNM Ecologist is developing a plan for monitoring these species that can be carried out by monument staff and volunteers.

Stressors Affecting Rare and Endemic Plants

1. Invasive plants and animals
2. Land use history (including livestock grazing)
3. Changing climatic conditions
4. Unauthorized OHV activity

Invasive species/noxious weeds, land use history, and changing climatic conditions are suspected to be the principal stressors affecting rare and endemic plants in the monument. Unauthorized OHV activity use and associated mud bogging within the monument is also a stressor on rare and endemic plants.

Old Growth Emphasis Area Indicators

Old-growth forests are generally over 175 years old and have the following special characteristics: a multi-layered, multi-species canopy dominated by large overstory trees; a



Old growth mixed-conifer stand

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.

Old Growth Habitat: Status and Trends

Status of Resource, Object, or Value	Trend
Need Additional Information	As a result of land acquisitions, grazing lease retirements, restoration, and noxious weed treatments, the ability of the land to naturally restore is probably improving the habitat. There is 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
112,928	52,935	24,340	10,000

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:

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" of ecosystem health.

The monitoring protocol for NSOs has been established for many years. The Forest Service has been monitoring NSOs regularly, and the CSNM will be coordinating closely with them with regard to new areas to monitor. New sound recording equipment was acquired in 2017 that has simplified surveys. See the *Research Section* of Chapter 4 for a more detailed description of this program.

5. Old Growth Birds (Pileated Woodpecker, Pygmy Nuthatch, Flammulated Owl, 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 monitoring sites on the CSNM. Negotiations will be pursued in 2018. See the *Research Section* of Chapter 4 for a more detailed description of this program.

6. Fisher (*Martes pennanti*)

A resident of coniferous and mixed coniferous forests, the fisher once occurred throughout much of Canada and northern and 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 other findings, fishers and a few 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.



Fisher captured in CSNM

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. See the **Research Section of Chapter 4** for a more detailed description of this program.

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 (alga or cyanobacterium).



Lichen community on Vulture Rock in CSNM

Lichens are highly valued ecological indicators known for their sensitivity to a wide variety of environmental stressors including air quality and changing climatic conditions. 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 2018 in conjunction with

regional universities. Research on local lichen importance as a bio-indicator will be encouraged and supported by the CSNM. See the **Monitoring Section of Chapter 4** for a more detailed description of this program.

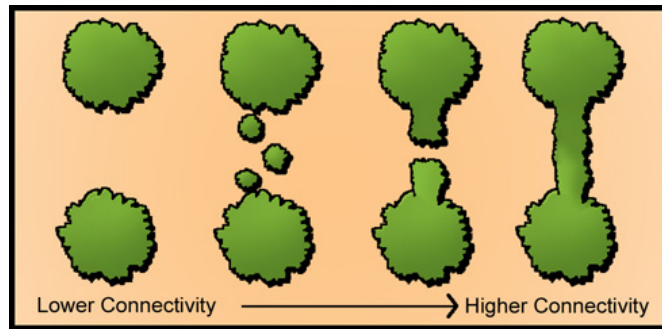
8. Habitat Connectivity and Fragmentation

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.



Habitat connectivity illustration (USDA)

No work on connectivity was accomplished in 2017, but the monument is planning extensive work in this area in 2018. The information is crucial to understanding vital linkages within the monument and extended connections to neighboring lands and the region.

Stressors Affecting Old Growth Emphasis Area Indicators

1. Loss of habitat
2. Habitat fragmentation
3. Fire suppression
4. Changing climatic conditions
5. Unauthorized OHV 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 high intensity 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. Changing climatic conditions and certain types of unauthorized OHV use are additional stressors on old growth habitat within the monument.

Diversity Emphasis Area Indicators

The Diversity Emphasis Area in 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 yield 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
112,928	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.

In 2017, a little progress was made with stream temperature monitoring. In 2018, the CSNM will be assessing past efforts and consolidating the information in order to better plan future monitoring needs.

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. In 2017, no progress was made with this indicator. In 2018, the monument will be assessing past efforts and consolidating the information in order to better plan future monitoring needs.

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 them to extend over much larger 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, as the aquatic environment itself undergoes changes that critically affect ecosystem structure and function. These aquatic habitat changes resulting from beaver activity benefit threatened species such as the Oregon spotted frog, snails, butterflies and other invertebrates. In 2017, no progress was made with this indicator. In 2018, the CSNM

will be assessing past efforts and consolidating the information in order to better plan future monitoring needs.

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



Oregon Spotted Frog habitat at Parnips Lakes

the frogs use for basking and escape cover (Leonard et al. 1993, Corkran and Thoms 1996, McAllister and Leonard 1997). Oregon spotted frogs appear 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>).

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 canary grass. 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 unofficially monitored in CSNM for over 15 years by Dr. Michael Parker of Southern Oregon University. This work will be synthesized and incorporated into new monitoring protocols. See the *Research and Monitoring Sections of Chapter 4* for a more detailed description of this program.

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. No progress was made in 2017 with this element. Lack of funding and other priorities will likely limit progress with monitoring this element in 2018.



Fumunicolus sp.

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 changing climatic conditions.



Bumble bee survey in CSNM

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 proven extremely important for scientific research on changing climatic conditions. 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 created the monument. Research and monitoring of pollinators in CSNM is a vitally important aspect of understanding the monument's 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 with the assistance of a variety of groups.

In 2017, the CSNM Ecologist developed a Cooperative Agreement with the Xerces Society to develop protocols for butterfly monitoring in the monument. See the *Monitoring Section* of **Chapter 4** for a more detailed description of this program.

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 five 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 two miles of Jenny Creek below Jenny Creek Falls (Kerr 2010).

Fish population monitoring at CSNM will be coordinated with the state of Oregon Department of Fish and Wildlife and other agencies active in fish population trend monitoring. See the *Research Section* of **Chapter 4** for a more detailed description of this program.

Plant Communities

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.



DEA plant community

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
112,928	52,935	65,341	15,000

16. Terrestrial Vegetation Monitoring Plots

Monitoring terrestrial vegetation will be accomplished by using existing NPS long-term terrestrial vegetation monitoring protocols. Crews from the NPS may be utilized 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 indicate trends within the monument but within the region as a whole. Relating monument data with regional and national sources is an important part of assessing trends. See the *Monitoring Section* of Chapter 4 for a more detailed description of this program.

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 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. No work on this element was performed in 2017.

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 BLM studied impacts of livestock grazing on objects of biological interest. 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.



Trespass cattle in Jenny Creek in CSNM

The following are some of the key findings reached by scientists studying the impact of livestock grazing on the Cascade-Siskiyou National Monument: 1) Mixed conifers, oak woodlands, small springs and riparian areas showed signs of livestock damage, including soil compaction, reduction of streamside vegetation, increased delivery of sediment to streams, elevated temperatures and reduced dissolved oxygen levels in springs; 2) Small mammals showed the greatest losses from grazing with 38 percent lower cumulative biomass (total weight) and 20 percent lower abundance in heavily grazed areas. Livestock-related losses were greatest to harvest mice, woodrats and long-tailed voles; 3) Livestock grazing may have negative effects on predator-prey dynamics by reducing abundance of small mammals that are important prey of the threatened northern spotted owl in southwest Oregon, particularly woodrats and deer mice; 4) Bird communities in heavily grazed areas had fewer long-distance migrants,

foliage gleaners and shrub-nesting species but higher numbers of ground nesters; and 4) Small springs used heavily by livestock had significantly higher temperatures and lower dissolved oxygen concentrations (Alexander et al 2007, Runquist 2011, Barr et al 2004, BLM 2005, DellaSalla and Barr 2007, Whitridge et al 2015, Johnson 2010).

In 2017, there were a number of grazing trespass problems in the monument. One particular area of concern was the former Box O Ranch in the SMW, near Jenny Creek. In 2018, the CSNM Ecologist will be setting up a monitoring program to monitor the fence and fix problem areas.

19. Forest Dynamics

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

1. 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.
2. 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 Research Natural Areas (RNAs) using permanent plots. This project is designed to detect forest community changes with respect to changing climatic conditions. There are four established permanent quantitative baseline monitoring transects within each of the two RNAs in CSNM, as part of a nationwide effort to measure changing climatic conditions on BLM lands.
3. There are permanent, long-term forest stand plots set up by the USFS and BLM. These are macro-plots with a five micro-plot design on a 1.6-mile grid. This BLM/USFS interagency 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.
4. 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).



Valley to mountain transition

CSNM staff will analyze the products from these data sources and plan additional plots, if necessary. No progress on this element was made in 2017.

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 plants 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.

Changing climatic conditions, altered hydrology from impoundments and the road system, ground-disturbing activities, and unauthorized OHV activity are all influences that favor spread of non-native, noxious, and invasive plants. The existing transportation system within the monument provides pathways for new invader 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; changing climatic conditions; and unauthorized OHV activity.

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. No progress with this element in 2017.

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 overstated. 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. There was no progress with this element in 2017.

Stressors Affecting Soils

1. Changing climatic conditions
2. Invasive plants
3. Ground-disturbing activities
4. Altered hydrology
5. Unauthorized OHV activity

Changing climatic conditions, altered hydrology from impoundments and the road system, invasive species, and unauthorized OHV activity 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 of 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 Environmental Quality to determine the most efficient protocols for augmenting their program and supplying CSNM with the necessary data for effective water quality analyses.



Spring runoff in CSNM

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). Aquatic macroinvertebrates serve an important function as indicators of water quality and ecosystem function. 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 collaborate on protocols and share data for local and regional trend analyses.

Stressors Affecting Water Quality Indicators

- 1) Changing climatic conditions
- 2) Ground-disturbing activities
- 3) Altered hydrology
- 4) Unauthorized OHV activity
- 5) Poor restoration planning

Changing climatic conditions, altered hydrology from impoundments and the road system, ground-disturbing activities, and unauthorized OHV activity 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, 12,602 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.

Proactive management has reduced the potential for both recreation-related impacts (unauthorized OHV 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. Removal of interior legacy fences has improved habitat connectivity, as well as enhanced wilderness character.



View of Mount McLaughlin from Table Mountain

Summary of Performance Measures

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

7

Manager's Letter

Successes

New Interpretation and Environmental Education Programs

A trio of new interpretation, education and outreach programs had their inaugural year in 2017. CSNM hosted three new programs – Artist in Residence (AiR), Teacher on Public Lands (TPL) and Interpretive park ranger interns. Additionally, CSNM's *Fall in the Field* program received *Hands on the Land* (HOL) program designation status. The *Fall in the Field* program, conducted in coordination with Southern Oregon University, hosted over 1,100 students, teachers, and chaperones for an experiential learning experience in the monument.

Artist in Residence – CSNM's first AiR program was announced February 2017. Over a dozen applications were received, from which three AiRs were selected. Darlene Southworth, watercolorist, Mabrie Ormes, and Matt Witt, were all selected for visual arts. The CSNM Artists in Residence held public events and even completed a joint showing of their work at the Ashland Artists Gallery, Labor Day weekend 2017.

Teacher on Public Lands – CSNM's first-ever TPL program was announced March 2017. Tara O'Malley, a local 3rd grade teacher was selected. Tara is a teacher at Table Rock Elementary school in White City, Oregon. During the summer, Tara jumped right into an introduction to the BLM and CSNM by shadowing several specialists in their jobs. Tara also spent several days at the monument seeing how the park rangers performed their jobs firsthand.

Interpretive Interns – CSNM selected three interpretive park ranger interns from a robust pool of applicants from Southern Oregon University's Environmental Education M.S. program. The park ranger interns staffed the CSNM information station, performed roving interpretation along CSNM's trails and provided interpretive programs at the campground and along the trails.

BioBlitzes

Working in coordination with the Friends of Cascade-Siskiyou National Monument, the CSNM conducted two BioBlitzes in FY 2017, a fungi BioBlitz in November and a Herpetology BioBlitz in May. Both events involved local



Crater High School class participating in Fungi BioBlitz

volunteers, members of academia, CSNM staff, the Friends Group, and yielded a wealth of useful scientific information.

Soda Mountain Wilderness Restoration of the Legacy Transportation System

In the Soda Mountain Wilderness Stewardship Plan (2012), the BLM proposed to actively stabilize and restore approximately 23 miles of former vehicle routes (approximately 29 percent of the former vehicle routes within the SMW on BLM-managed lands) and remove 81 culverts. The BLM grouped the restoration of former vehicle routes into eight priority areas based on urgency of needed treatment, culvert density, and logical treatment areas. As of 2017, all 23 miles of the former vehicle routes proposed in the plan had been decommissioned, either by full recontouring, partial recontouring, or a combination of both treatments. In the process of the road decommissioning, a total of 79 culverts were removed from the wilderness. In addition to the restoration identified above, in 2016 the BLM removed the concrete pad, foundation wall, and abandoned utility lines at a former communications site in CSNM, in an area adjacent to the Soda Mountain Wilderness. The



Road in SMW recontoured in 2013 and converted to hiking path

hillside site was recontoured and seeded with natural vegetation.

From 2013 through 2017 a total of 9.75 miles of livestock fencing was removed from within the Soda Mountain Wilderness. Five cattleguards, three water troughs, and five spring development structures were also removed. Where possible, the fencing and relic grazing infrastructure removal was completed prior to, or during the road decommissioning activities when there was temporary vehicle access for the excavation work.

Currently, the former Box-O Ranch area (priority 8), is the only restoration priority area identified in the SMW Stewardship Plan that has not been completed. Remaining work includes removal of all culverts in the formal canal system, adding additional relief drains to the canal, and removal of legacy ranching materials not retained for interpretive purposes. Outside of this priority area, many miles of fence, water developments, and other former range improvements are yet to be removed from the CSNM.

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 12,602 acres have been added to the CSNM with Land and Water Conservation Funds. Work continued on land acquisition efforts in 2017, with the 314-acre Mountcrest parcel being purchased with the assistance of the Pacific Forest Trust.

Friends of Cascade-Siskiyou National Monument

The Friends of Cascade-Siskiyou National Monument (FCSNM) worked closely with monument staff in 2017 to continue to build capacity and position themselves to be a robust partner in accomplishing the monument's mission. In 2017 the Friends worked on educational, outreach, and interpretive activities. The monument looks forward to working together with the FCSNM on many future projects.

Staffing

In 2017, the CSNM filled two positions key to moving forward with a variety of important science, monitoring, and restoration projects. Both the Monument Ecologist and Monument Planner positions were filled in January.

Challenges/Opportunities

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, ecological inventory and monitoring, 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. 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 in the CSNM near the California Border

Feral Horses

Feral horses are an ongoing issue on the CSNM. Near the California border in the Agate Flats area, approximately 50 feral horses now occupy the monument for part of the year. These horses are creating trails and causing impacts. CSNM staff are exploring options for repairing existing fences and obtaining grant funding for the construction of new fences.

Hyatt Lake Recreation Complex

The majority of monument facilities and infrastructure reside in the Hyatt Lake Recreation Area and Campground, which was originally constructed in 1969. Many of the subsequent facilities were built in the early 1970s. Several projects have been completed over the last few years to enhance the visitor experience at Hyatt Lake, including new boat ramps and a new visitor contact station. However, there is a substantial gap in need versus available funds for infrastructure repairs and maintenance. Ongoing challenges with the aging water and septic systems indicate a major need for infrastructure maintenance at the campground. For over a month this summer, the water system was shut down at the campground and portable toilets were brought in for campers. The recreation complex is the principal 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 best meet public needs and monument goals.

Law Enforcement

The Medford District encompasses over 870,000 acres of federal land. For this land base, there are three BLM law enforcement Rangers, two full-time contract Deputies, and a seasonal Deputy. In 2017, 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, unauthorized OHV travel, mud bogging, vandalism, and campground-related issues. Law enforcement coverage and visibility is essential to provide user education, encourage compliance with rules and regulations, and foster stewardship and awareness of the monument and wilderness and their unique features. CSNM staff have funded additional patrols in the monument during key times of the year, and continue to explore options to increase law enforcement where necessary.

Appreciation

Most of the accomplishments described in this report would not have been possible without the ongoing and expanding support of our highly motivated and creative partners, volunteers and dedicated staff. We cannot thank them enough for their tireless service to the Monument's unique and varied resources and values. Thank you!

Appendix A:

2017 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 2017
	Research collaboration with SOU Faculty	SOU and Friends of Cascade-Siskiyou NM	Develop a cooperative research relationship focused on CSNM. Coordinate resource management projects in CSNM	Multiple meetings to explore interest and opportunities. Ecologist becomes Adjunct Faculty Member	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
	Volunteer Group Presentations	Charles Schelz, Ecologist	Objective is to educate public about the unique ecological qualities of the monument.	Ecologist met with over 10 volunteer groups and gave presentations on the monument and ecology issues.	
	Post-grazing Vegetation Change	SOU professors	Revisit vegetation transects post-grazing removal and identify changes taking place	Final report received, publication pending	Last visit: 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	BLM recommends that the Box O Ranch Complex (BLM site #OR110-1584), as not eligible for listing on the	Initiated: 2009 Completed

			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 Ranch Complex.	National Register of Historic Places. Various structures and features found within the Box O Ranch Complex, can still portray a semblance of the ranching experience in southwest Oregon.	Final Report 2010
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
	Plantation Treatment Planning and Research	Charles Schelz, CSNM Ecologist Scott Abella, University of Nevada, Las Vegas	Treatment of 7 plantations to act as prototypes for treatment research. Goals are to enhance development of late seral stage forest, enhance wildlife habitat, improve forests, and develop ecologically healthy forests.	Compliance started in 2017, will finish in early 2018. Cooperative Agreement with Univ. of Nevada developed Cooperative Agreement with Lomakatsi Restoration	Initiated: 2017 On-going
	Long-term Vegetation Plot establishment	Charles Schelz, CSNM Ecologist	Goal is to have over 50 long-term vegetation plots established within the monument representing various plant communities. Designed to monitor changes and trends of different plant communities.	1 Plot established by volunteer group	Initiated: 2017 On-going

			Protocols are set and developed. Need funding for establishing the plots.		
	Lichen Monitoring in CSNM	Charles Schelz, CSNM Ecologist	To monitor lichens for changes over time and to correlate with pollution standards and changing climatic conditions trends.	Field data collected in 2017 Draft protocol in 2018	Initiated: 2017 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; Joan Hagar, Research Wildlife Biologist, USGS; Daniel Sarr, National Park Service;	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 Monument, Redwood National and State Parks, and Whiskeytown National Recreation Area), and the BLM’s Cascade-Siskiyou National Monument.	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 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).	Initiated: 2011 On-going Interim Report: 2013

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: <ul style="list-style-type: none"> 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 saprotrophic status of the truffle <i>Schenella pityophilus</i> 2013	Initiated: 2010 On-going Final: 2015
Oak woodland, shrubland and grassland composition and structural surveys.	Darlene Southworth Ph.D. emeritus SOU Kelly McDonald and Jason Pennell (CBG)	Forest stand surveys including plant composition, hardwood structure (branching and diameter-at-breast-height, and stand age) will facilitate understanding of past fire behavior on hardwood-dominated ecosystems of the monument. Create geo-spatial database in GIS.	Analysis using multivariate techniques within the statistical package called PCORD. Data gathering complete; working on analysis. Submitted journal publication in 2011.	Initiated: 2008 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 changing climatic conditions. The project establishes 4 permanent quantitative baseline monitoring transects within RNAs as part of a nation-wide effort to measure changing	Baseline data recorded in 2010/2013.	Initiated: 2010 On-going

			climatic conditions 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.		
	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
	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
Wildfire					

Wildlife	Meeting Bird Conservation Objectives in the Klamath Siskiyou Bioregion	John D. Alexander, MS, PhD 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 Will work with CSNM ecologist to add additional plots if funding becomes available.		Initiated: 2010 On-going Final: 2013
	Acoustic Monitoring of Old Growth Wildlife Communities	Charles Schelz, CSNM Ecologist	Data Collected in 2017 at 8 sites. Data analysis at Southern Oregon University.		Initiated: 2017 On-going
	Wildlife Photo Monitoring	Charles Schelz, CSNM Ecologist	Photo monitoring of wildlife at key wildlife corridor areas within CSNM		Initiated: 2017 On-going
	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 at Pilot Rock. Results submitted for statewide compilation	Initiated: 2004 On-going
	Fisher Surveys Federal Candidate Species Bureau Sensitive Species	Sean Matthews, Oregon State University 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. Oregon State University is finishing 4 year study of collared individuals. Study should be extended but no funding	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	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	Initiated: 2003 On-going

	Bureau Sensitive Species			consistently 20 or less.	
	Spotted Frog	USF&W	Oregon Spotted Frog 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. Collaborative habitat enhancement restoration project planned for 2018	Listed as a threatened species under ESA Proposed Critical habitat designation with map available.	Initiated: 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 <i>Bombus franklini</i> 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 <i>B. franklini</i> were observed since 2017	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
Wildlife	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	Improve knowledge of various species range, population, and site specific information regarding meadow associated species to assist in	Field data collected in 2014.	Initiated: 2014 On-going

	UC Davis Department of Entomology and Nematology	management for the persistence of these species. Target Species List and Ranks: 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	Three species were found in meadows. Bombus occidentalis, Speyeria coronis nr. coronis fritillary, and Chloealtis aspasma were all found at various locations. <i>Chloealtis aspasma</i> (Siskiyou short-horned) was identified at twelve of the thirty-one sites visited. Coronis fritillary (<i>Speyeria coronis</i>) were found at Keno Access, Shale Divide, and O'Brien Creek. <i>Bombus occidentalis</i> was found in the eastern half of the bioregion, at Buck Divide, Keno Access and Hoxie Creek meadows visiting <i>Solidago</i> .	Interim report in 2015
Lepidoptera Monitoring	Charles Schelz, CSNM Ecologist Candace Xerces Society Dana Ross, Consultant	Development of protocols and field work to monitor butterflies and moths within CSNM. Xerces Society will focus on butterflies, Dana Ross will help with moths.	Initial field collection and recon of potential long-term sites in 2017	Initiated: 2017 On-going
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.	78 species found at 4 sites and 1245 individuals 15 mile diameter circle is centered at the junction of Highway 66 and East Hyatt Lake Road Latitude: 42.1230 Long: 122.4644 2017	Initiated: 2012 On-going

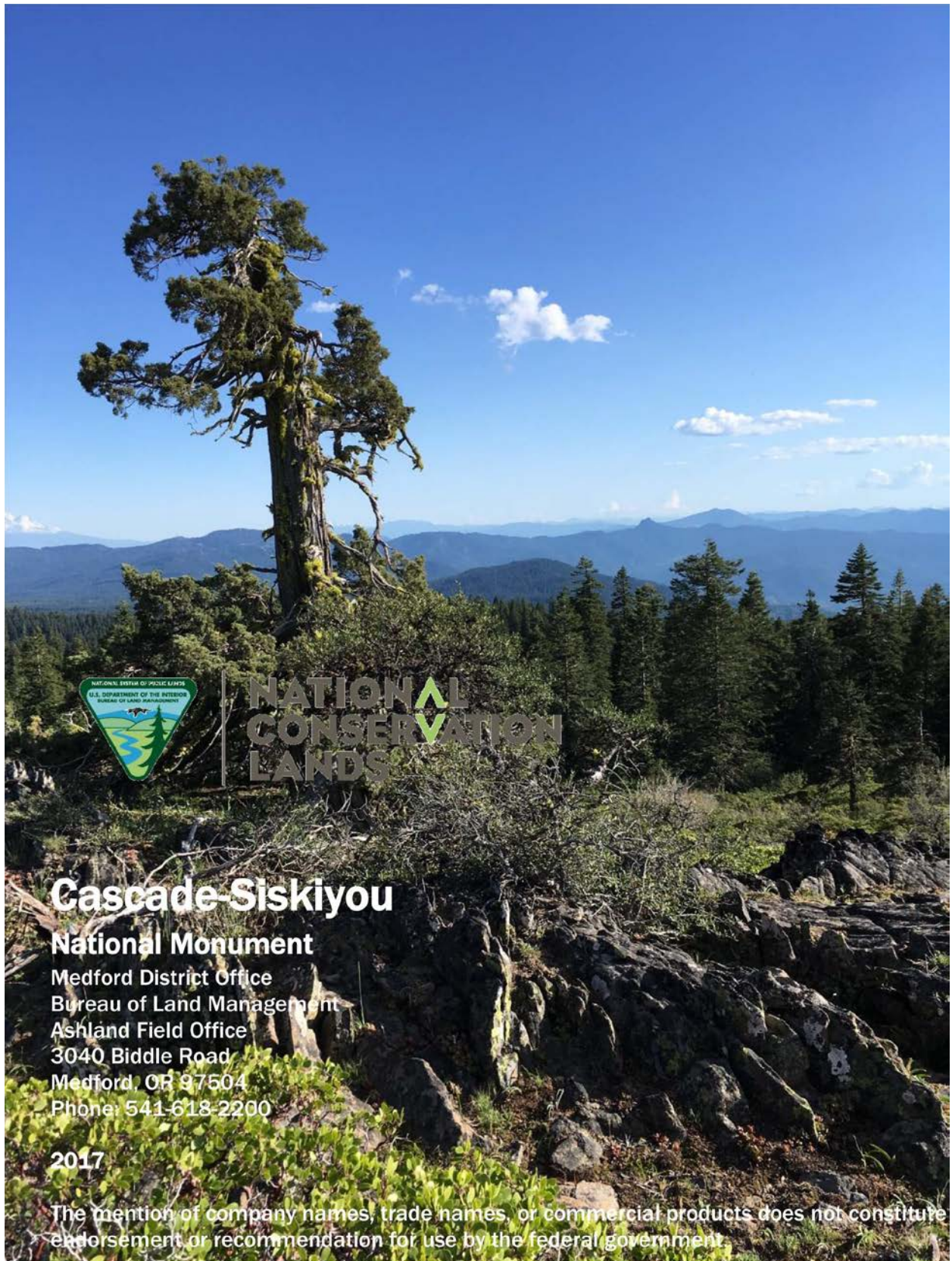
Botany	<p>Limnanthes floccosa ssp. bellingeriana</p> <p>Population Monitoring</p> <p>Bureau Sensitive Species</p>	<p>Kerry Byrne, OR Inst. Of Technology,</p>	<p>Estimated population size (map polygon) and number of plants at two populations; established two 50m transects and randomly selected 10 1m² 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.</p>	<p>Populations mapped, counted and will be entered into GeoBOB. Data and analysis due by end of calendar year 2015.</p>	<p>Initiated: 2012</p> <p>On-going</p>
	<p>Greene's mariposa lily (Calochortus greenei)</p> <p>Population Monitoring and effects of grazing on Greene's mariposa lily (Calochortus greenei) over 10 Years</p> <p>Bureau Sensitive Species</p>	<p>Tom Kaye, Ph.D, Inst. for Applied Ecology</p>	<p>Permanent fenced/unfenced paired plots established. Three study areas that span the range of cattle utilization.</p> <p>In 2003, fifteen pairs of 2 m x 2 m large-mammal exclosures and controls were established in <i>C. greenei</i> populations, five in each of the three study areas:</p> <p>In 2007, established a total of 14 1 m x 1 m all-mammal exclosures, with seven in Colestine and seven in Agate Flat.</p> <p>Each individual <i>C. greenei</i> plant was mapped, the length and width of each <i>C. greenei</i> leaf in all plots was measured, plant height and flower/bud number were also recorded.</p>	<p>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.</p> <p>Changing climatic conditions may improve conditions.</p> <p>Further research to better measure seed germination and seedling establishment would improve <i>C. greenei</i> population modeling.</p>	<p>Initiated: 2003</p> <p>On-going</p> <p>Final: 2012</p> <p>Report located at: Medford BLM and http://appliedeco.org/reports</p>

<p>Gentner's friillaria (<i>Fritillaria gentneri</i>)</p> <p>Population Monitoring</p> <p>Federally Endangered Species</p>	<p>Richard Callagen and Richard Brock Siskiyou BioSurvey</p>	<p>Yearly monitoring of selected populations in Recovery Unit, 4. Annual revisits of 12 selected populations.</p> <p>Tracks long-term change (abundance and phenology) over time by population.</p> <p>Presence/absence and demographic data over time.</p>	<p>Annual Medford Dist. monitoring report. Data updated yearly in GeoBob.</p> <p>Annual Review of <i>Fritillaria Gentneri</i> on BLM Lands 2014 Report</p> <p>Individuals do not flower every year.</p> <p>Populations can only be detected with mature, flowering individuals.</p>	<p>Initiated: 1999</p> <p>On-going</p>
<p>Gentner's friillaria (<i>Fritillaria gentneri</i>)</p> <p>Population Augmentation and Monitoring</p> <p>Federally Endangered Species</p>	<p>Bob Meinke, Plant Division Oregon Department of Agriculture</p>	<p>Bulblets grown in greenhouse are out-planted at existing populations to increase population size.</p> <p>Objective is to meet recovery criteria and contribute to recovery of species.</p> <p>Track change (demographic data - abundance and phenology) over time by population.</p>	<p>Reported in semi-annual monitoring report by ODA. Data updated yearly in GeoBob. %50 of individuals out-planted do not survive.</p> <p>Refining suitable habitat characteristics and timing of out-planting to increase survival.</p>	<p>Initiated: 2008</p> <p>On-going</p>
<p>Gentner's friillaria (<i>Fritillaria gentneri</i>)</p> <p>Population Augmentation and Monitoring</p> <p>Federally Endangered Species</p>	<p>Bob Meinke, Plant Division Oregon Department of Agriculture</p>	<p>Twenty plants of <i>Fritillaria gentneri</i> 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.</p>		<p>Initiated: 2014</p> <p>On-going</p>

<p>Ectomycorrhizae associated with <i>Cercocarpus ledifolius</i> and <i>Quercus garryana</i> var. <i>brewerii</i> in southern Oregon.</p>	<p>Darlene Southworth, Ph.D. emeritus SOU</p>	<p>Survey the diversity and abundance of ectomycorrhizae associated with <i>Cercocarpus ledifolius</i> and <i>Quercus garryana</i> var. <i>brewerii</i>.</p>	<p>Final results: 18 species of ectomycorrhizal fungi have been identified on roots of <i>Cercocarpus</i>, the first such information anywhere. 5 of these are shared with <i>Q. garryana</i> var. <i>brewerii</i> suggesting a mycorrhizal network linking the shrubs. New species described in journal.</p>	<p>Initiated 2007 Final 2011. Data gathering complete; analysis complete; manuscript submitted, accepted in 2011. Poster presented at Botanical Society of America meeting 2008.</p>
<p>Movement, Seasonal Habitat Use, and Spawning Locations of the Jenny Creek Sucker (<i>Catostomus rimiculus</i> sp.).</p> <p>BLM Strategic Species</p>	<p>David Hering, Fishery Biologist, Crater Lake National Park</p>	<p>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.</p> <p>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.</p> <p>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.</p>	<p>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.</p>	<p>Initiated: 2013 ongoing</p>

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 during high streamflow events. Sampling is infrequent as opportunities arise. (15 sites in CSNM)	Monthly and annual summary information for each water year. Data stored at Medford BLM	Initiated: June 1998 Ongoing
Soils	Soil Biota and texture analyses	Charles Schelz, CSNM Ecologist Scott Abella, Univ. of Nevada, Las Vegas Melanie Malone, Oregon Extension	Objective is to analyze soils and create amendments, both biotic and abiotic, that will enhance soil health and soil biota health.	Samples collected in 2017 for analysis	Initiated: 2017 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.	2002-2006 6,000 yearly	Initiated: 2002

			Visitor counters placed to detect yearly use.	2006-2008 7,500 yearly	Ongoing
	Hyatte lake Recreation Area Visitor Use	none	Monitor Campground, visitor use and activities		Initiated: 2002 Ongoing
Invasive Plants	CSNM Weed Control	Jeanine Moy, Klamath Siskiyou Wildlands Center; 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	Livestock trespass problems in Jenny Creek. Monitoring of Fence line in 2018 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



**NATIONAL
CONSERVATION
LANDS**

Cascade-Siskiyou

National Monument

Medford District Office

Bureau of Land Management

Ashland Field Office

3040 Biddle Road

Medford, OR 97504

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2017

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