



Big Meadows Mountain Meadow & Aspen Restoration Project

2017 – 2023 Summary Report





“Just beneath heaven are mountain meadows”
- All species who rely on these critical habitats

Project Elements

- Aspen Recovery
- Mountain Meadow Restoration
- Invasive Plant Management
- Research and Outreach

Big Meadows Mountain Meadow and Aspen Restoration Project is designed to enhance aspen and mountain meadow habitats at Big Meadows, a property that is privately owned by Ecotrust Forest Management (EFM). EFM owns approximately 40,000 acres in the Klamath Mountains of Siskiyou County, known as the Scott River Headwaters Property. The Scott River Headwaters Property Management Plan, developed by EFM, specifically identifies and prioritizes the restoration of aspen woodlands. As such, EFM and Scott River Watershed Council (SRWC) partnered with the goal of improving these critical habitats. The Big Meadows complex is one of the largest mountain meadow systems within the Scott River watershed. Besides the expansive meadow system, this area is known for large areas of aspen, which are only found in a few locations within the Scott River watershed. The elevations within the project area range from just over 6,000 feet to nearly 6,500 feet.



Mountain meadows are unique ecosystems that provide critical hydrological functions such as water storage, filtration, and late summer release. The hydrology of mountain meadows is complex, with specific surface flow and snowpack impacts that contribute to the water supply. Within the Scott Valley, snowpack provides a significant portion of the water in the spring and summer. Today, there is a growing understanding and acknowledgment of the possible impacts these areas have on a basin’s water quality and quantity.

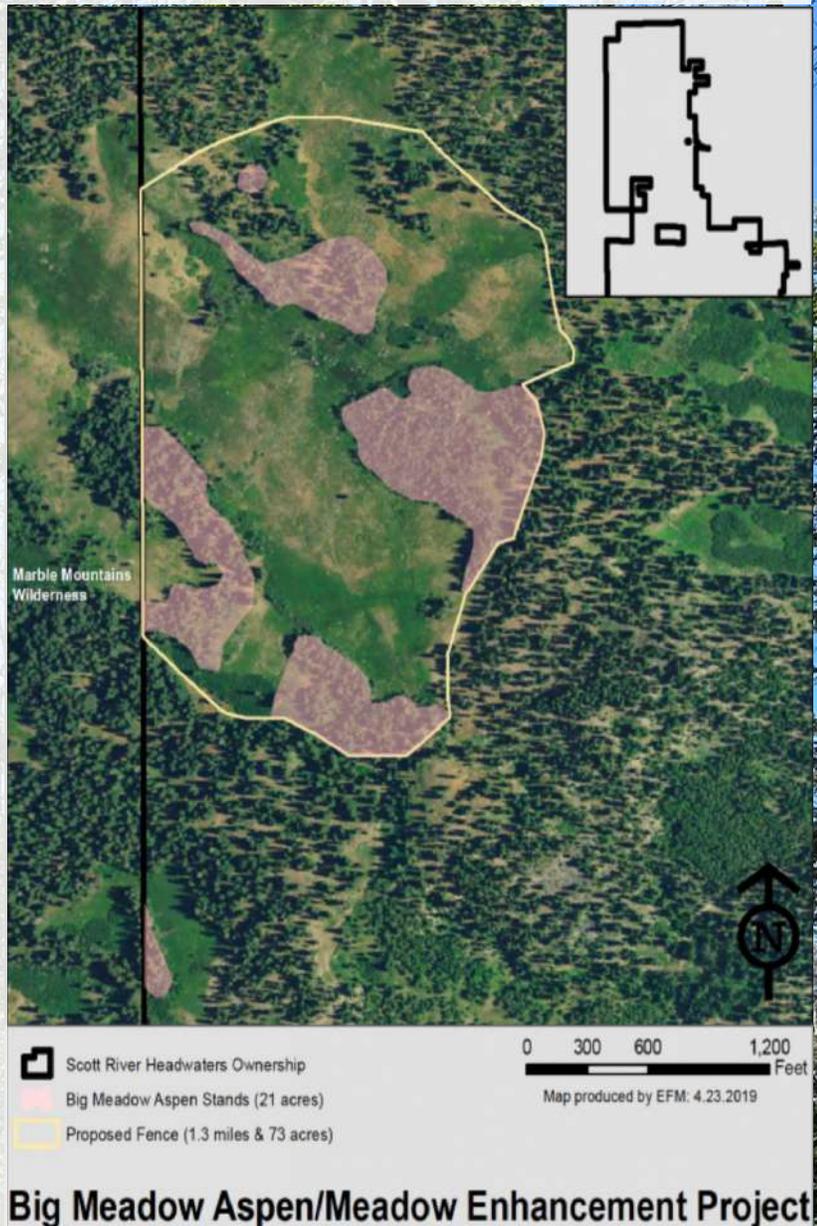
Quaking aspen (*Populus tremuloides*) provide numerous benefits such as an increase in biodiversity, fire resistance, water conservation, and forage (Rogers 2017).

Water conservation within aspen forests, the impacts on snow accumulation, soil moisture and their ability to retain water content is greater than conifer dominated forest (LaMalfa 2008). Aspen and montane meadow vegetation communities provide important ecological services throughout the western United States (Roche et al. 2014). Aspen has been identified as a keystone species due to its disproportionate and significant impact on biological diversity and ecological function (Bartos 2001). The California State Wildlife Action Plan designates “subalpine aspen forests” and “wet mountain meadows” as two of the fourteen statewide conservation targets within the Klamath Mountains Ecoregion (CDWF 2015). Subalpine aspen forests and wet mountain meadows provide habitat for a multitude of focal wildlife species including state-listed salamanders and California special-status amphibian, bird, and mammal species. Additional benefits provided by healthy mountain meadows include carbon sequestration, water filtration, and supporting an immense amount of biodiversity.

Unfortunately, meadow degradation is widespread across much of the West. Intense livestock grazing coupled with fire exclusion, have led to the simplification and incision of many meadow channels. These incised channel impair the meadows’ ability to store and release water at critical times and can lead to non-meadow species thriving. In both meadow and aspen habitats, advanced succession (the process in which vegetation progresses overtime and may or may not be interrupted by disturbances such as fire) leads to an increase in the ability for conifer species to advance into these areas and over time can eventually convert these areas to forest. Historically, fire served the role of moderating the conifer’s ability to complete aspen-to-conifer or meadow-to-conifer succession.

Although there is not an active allotment on the subject property, there are two bordering active allotments within the Klamath National Forest, and significant drift from those herds has been documented, particularly late in the fall when degradation to the aspen stands is most prevalent. Ultimately, it is the responsibility of a landowner to fence livestock out according to Siskiyou County’s open-range law.

The Project has treated approximately 23 acres of conifer encroachment, fenced out 75 acres of meadow and aspen, and conducted numerous monitoring activities to document overall aspen and meadow health. This site has also served as an outdoor classroom for Scott Valley youth, college interns, and citizen scientists alike.



Big Meadow Aspen/Meadow Enhancement Project

Bartos, D.L. 2001. Landscape dynamics of aspen and conifer forests. In: Shepperd, W.D.; Binkley, D.; Bartos, D.L.; Stohlgren, T.J.; Eskew, L.G., comps. Sustaining aspen in western landscapes: symposium proceedings. Gen. Tech. Rep. RMRS-P-18. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 5–14.

California Department of Fish and Wildlife (CDFW). 2015. California State Wildlife Action Plan, 2015 Update: A Conservation Legacy for Californians. Edited by Armand G. Gonzales and Junko Hoshi, PhD. Prepared with assistance from Ascent Environmental, Inc., Sacramento, CA. <https://www.wildlife.ca.gov/swap>

LaMalfa, E.M., Ryle, R. Differential Snowpack Accumulation and Water Dynamics in Aspen and Conifer Communities: Implications for Water Yield and Ecosystem Function. *Ecosystems* 11, 569–581 (2008). <https://doi.org/10.1007/s10021-008-9143-2>

Rogers, Paul C. 2017. Guide to Quaking Aspen Ecology and Management with Emphasis on Bureau of Land Management Lands in the Western United States. Logan, Utah, Western Aspen Alliance. 98 P.

Project Activities Timeline

- Existing Conditions Assessment
- Conifer Removal
- Invasive Weed Management
- Effectiveness Monitoring
- Resource Acquisition

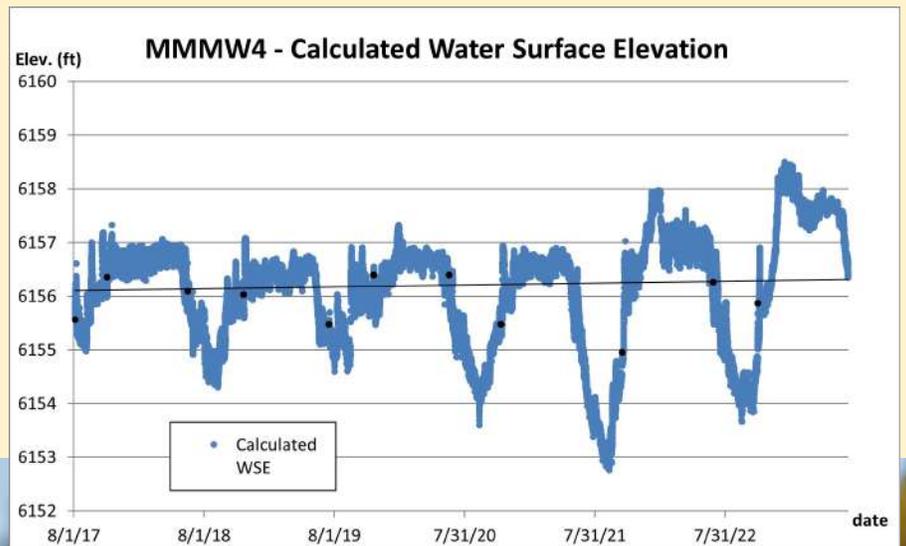
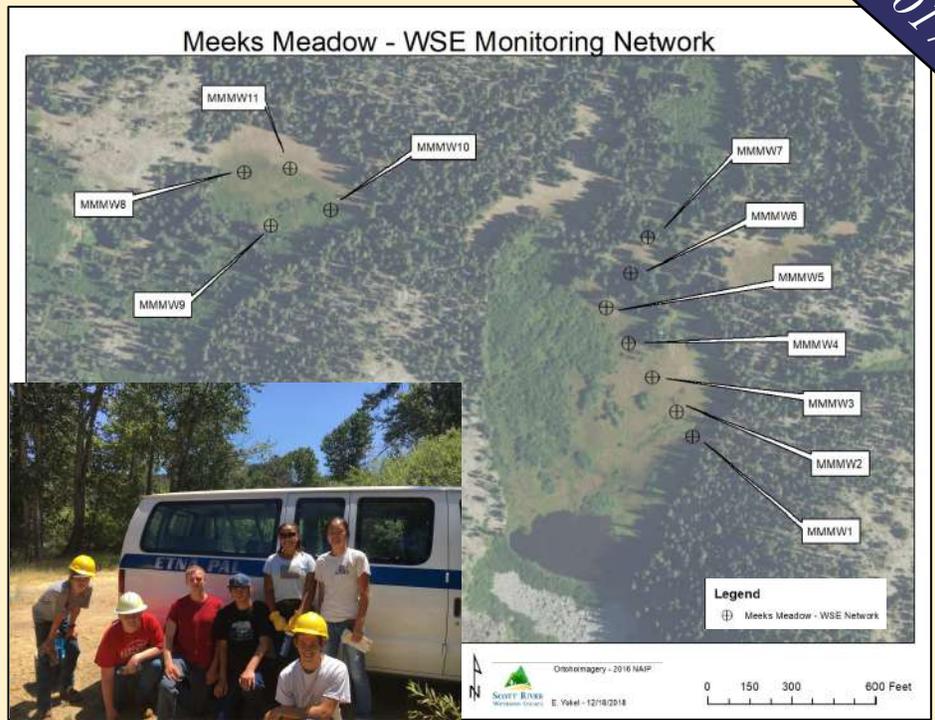
A glimpse through time: 2017 through 2023

2017		
	Existing Condition Assessment	SRWC began to work with EFM to initial work began to better understand the overall condition of the aspen and mountain meadow complexes of Big Meadow and Meeks Meadows
	Existing Condition Assessment	YESS installed groundwater well network in Meeks Meadows to start to understand the hydrology of the mountain meadows
2018		
	Existing Condition Assessment	On June 19th and 20th, a field tour in both the Big Meadows and Meeks Meadows was held with professionals from Klamath National Forest, California Department of Fish and Wildlife, National Oceanic and Atmospheric Administration and SRWC
	Existing Condition Assessment	A meadow assessment and a rare plant/botany survey was conducted by California Department of Fish and Wildlife (CDFW) and a private contractor, Katie MacKendrick, Sori Ecocultural Services LLC
	Effectiveness Monitoring	CDFW and SRWC established six aspen monitoring transects and collected data
	Invasive Weed Management	YESS hand treated the 2-acre area of Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness, upslope of Big Meadows complex
	Resource Acquisition	SRWC requested funding from United States Fish and Wildlife's Partners Program to support construction of exclusionary fence to keep out cattle out from two adjacent Klamath National Forest allotments
2019		
	Effectiveness Monitoring	Avian/bird surveys at the Big Meadows aspen and meadow restoration site performed by the Klamath Bird Observatory
	Effectiveness Monitoring	Surveys conducted by USFWS staff from the Yreka FWO specifically for Franklin's and Western bumble bees
	Effectiveness Monitoring	Sori Ecocultural Services LLC. conducted a 2019 Big Meadows Project Botanical Survey
	Effectiveness Monitoring	SRWC and YESS collected the data from the aspen transects
	Invasive Weed Management	YESS hand treated the 2-acre area of Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness, upslope of Big Meadows
	Resource Acquisition	SRWC received funding from the United States Fish and Wildlife's Partners Program to support the construction of exclusionary fencing to keep cattle out restoration area.
	Resource Acquisition	SRWC received funding from Wildlife Conservation Society for prescribed burning, a management tool for Big Meadows
	Resource Acquisition	SRWC received funding from Rocky Mountain Elk Foundation to support conifer removal from aspen

2020		
	Effectiveness Monitoring	SRWC established a comprehensive photo point network with 72 photos
	Effectiveness Monitoring	SRWC and YESS collected the data from the aspen transects
	Effectiveness Monitoring	USFWS conducted pollinator surveys specifically for Franklin and Western bumble bees at potential and historic sites
	Invasive Weed Management	YESS hand treated the 2-acre area of Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness, upslope of Big Meadows. Treatment also included the road system getting to Big Meadows on EFM property
	Conifer Removal	EFM worked with Jefferson Resource Company and Pat Johnson Logging to removal conifer from aspen stand, additional conifer removal was done using hand crews
	Meadow Recovery	SRWC began the installation of the infrastructure for an exclusionary fencing with the assistance from North River Construction
2021		
	Effectiveness Monitoring	SRWC and YESS collected the data from the aspen transects
	Effectiveness Monitoring	SRWC repeated 49 of the photo points
	Conifer Removal	Staff from SRWC and Quartz Valley Indian Reservation burned ~105 piles of removed conifer
	Invasive Weed Management	YESS hand treated the 2-acre area of Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness, upslope of Big Meadows. Treatment also included the road system getting to Big Meadows on EFM property
	Meadow Recovery	SRWC installed an electric fence around ~65 acres of meadow and aspen areas
2022		
	Invasive Weed Management	YESS hand treated the 2-acre area of Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness, upslope of Big Meadows. Treatment also included the road system getting to Big Meadows on EFM property
	Meadow Recovery	SRWC staff reinstalled and maintained electric fence through from the first of September through mid October. Unfortunately, cows are seen in site on November 30, 2022
2023		
	Effectiveness Monitoring	Klamath Bird Observatory conducted another avian/bird survey
	Effectiveness Monitoring	SRWC collected data from aspen transects & added a soil moisture meter inside and outside the enclosure
	Effectiveness Monitoring	SRWC repeated 70 photo points
	Effectiveness Monitoring	Caitlin Bean and Dianne Keller conducted a butterfly survey in and around the Big Meadows complex
	Invasive Weed Management	YESS hand treated the 2-acre area of Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness, upslope of Big Meadows. Treatment also included the road system getting to Big Meadows on EFM property.
	Conifer Removal	The Youth Environmental Summer Studies (YESS) crew treated approximately 3 acres of conifers within the aspen stands.
	Meadow Recovery	SRWC staff reinstalled and maintained electric fence throughout the season and will remove for winter
	Resource Acquisition	SRWC received funding from California Department of Fish and Wildlife to conduct a full assessment on the Big Meadow complex and all mountain meadow areas within the Scott River watershed
	Resource Acquisition	SRWC received funding from the United States Fish and Wildlife to support additional conifer removal and installation of exclusionary fencing

In 2017, the newly formed Youth Environmental Summer Studies (YESS) crew which developed out of a partnership with the SRWC, Klamath National Forest, Scott Valley United School District, Quartz Valley Indian Reservation, Salmon River Restoration Council, and the Etna Police Activities League installed eleven groundwater wells in Meeks Meadows. This site was meant to act as a control site and help understand the importance of groundwater banking in these high mountain locations in the face of climate change. Several important people helped facilitate this study design, including Don Flickinger, from NOAA. No such groundwater network has been established at Big Meadows at this time.

The monitoring wells consist of a 1 1/2" metal casing with a fabricated point. A 7' well casing was driven into the ground using a hand post pounder and when necessary, an additional 5' stick was added to ensure the well casing hit groundwater. The wells are equipped with Onset U20L-04 HOBO water level data loggers, set at 30-minute intervals. A nearby atmospheric pressure transducer is used to correct the data set for changes in barometric pressure. All the wells were surveyed to allow the groundwater surface to be displayed in mean sea level (MSL), a datum for measurement of elevation and altitude. These loggers collect data year-round. The figure to the right, is monitoring well #4 and is data from the summer of 2017 to 2023.



Bobette Jones, United States Forest Service, Ecologist and Aspen Specialist, June 20, 2018.

In 2018, SRWC began to work with EFM to develop a management plan for their holdings within the Big Meadow complex. Several important activities were initiated that first year. A field tour of forestry specialists and scientists from different agencies and organizations toured both Big Meadows and Meeks Meadows areas with a sole focus on discussing actions that could be taken to improve the poor condition of the aspens in both locations. As a result of this field exchange, SRWC developed phase one of the Big Meadows Mountain Meadow and Aspen Restoration Project with two main objectives:

1. Perform management actions that reduce the advance succession of the conifers within the aspen areas.
2. Reduce the browsing pressure on both the aspen and meadow areas from cattle from adjacent allotments.

Based on these project goals, SRWC submitted a request for funding to the United States Fish and Wildlife Partners Program in 2018 and was funded in 2019.



In 2018, YESS crew, consisting of 8 local Scott Valley youth, removed 2-acres of an invasive plant called Marlahan Mustard (Dyers woad) within the Marble Mountain Wilderness in a location adjacent to and directly upslope from the EFM's holdings. The plants were pulled, bagged, and removed from the site. This type of hand removal treatment has been performed every year since.



On June 27, 2018, the YESS crew pulled, bagged, and removed Marlahan Mustard from approximately 2 acres within the Marble Mountain Wilderness.



YESS crew taking data on an aspen transect in June 2018.

In July 2018, California Department of Fish and Wildlife Environmental Scientist Merissa Hanisko prepared a botanical scoping list for the Big Meadows project. Merissa queried the California Natural Diversity Database (CNDDDB) and the California Native Plant Society (CNPS) Rare Plant Inventory for all California Rare Plant Rank 1A, 1B, 2A, 2B, or 3 plants within the USGS 7.5' quadrangles that the project occurs within (i.e., Boulder Peak) and the eight adjacent quadrangles (i.e., Grider Valley, Scott Bar, Russell Peak, Marble Mountain, Greenview, English Peak, Yellow Dog Peak, and Etna). [Click here to read Big Meadows Project Botanical Survey Report.](#)

Additionally, the YESS and Merissa Hanisko established six aspen transects. These transects are 100' in length and 3' in width. Data was collected on the class size of the existing aspen (e.g., less than 18 inches, over 18 inches but less than 6 feet, over 6 feet and diameter of 6-foot trees and larger). Data of evidence of browsing pressure and canopy cover is also collected.

Polemonium carneum (Oregon polemonium), a California Rare Plant Rank 2B.2 (Plants rare, threatened, or endangered in California but may be more common elsewhere, within an aspen stand, found by Merissa Hanisko, CDFW, on July 3, 2018, in Big Meadows.



During the summer of 2019, the Klamath Bird Observatory (KBO) biologists conducted a set of three surveys at Big Meadows during the songbird breeding season (early June – mid-July at this high-elevation site) to study the pre-restoration bird community. During these surveys, 38 different bird species were recorded using the open meadow or aspen stands. The most abundant species observed in the meadow were Oregon Junco, Lincoln's Sparrow, and American Robin. The most abundant species in the aspen stands were Warbling Vireo, Western Wood-Pewee, Lazuli Bunting, and Dusky Flycatcher. Many species are using Big Meadows as breeding habitat – they observed Oregon Juncos, Lincoln's Sparrows, Chipping Sparrows, Mountain Chickadees, Brown Creepers, Northern Flickers, House Wrens, and Warbling Vireos either with fledglings or carrying food (a sign that parents are feeding nestlings or fledglings).

Lazuli Bunting and Warbling Vireo (c) Frank Lospalluto



Also found were several Red-breasted Sapsucker pairs nesting in cavities excavated in the older aspens. Additional Big Meadows visitors included Wild Turkeys with chicks, Red-Tailed Hawks, Sooty Grouse, and high-elevation specialists like Cassin's Finch and Calliope Hummingbird (the smallest hummingbird in North America). [Click here to read KBO's report.](#)



On July 16, 2019, YESS along with staff from the United States Fish and Wildlife Service staff, Rebecca Reeves and Sheri Hagwood, performed surveying for pollinators. The crew also pulled the Marlahan Mustard on the site upslope from Big Meadows (see photo above). The crew also completed data collection on the six aspen transects.



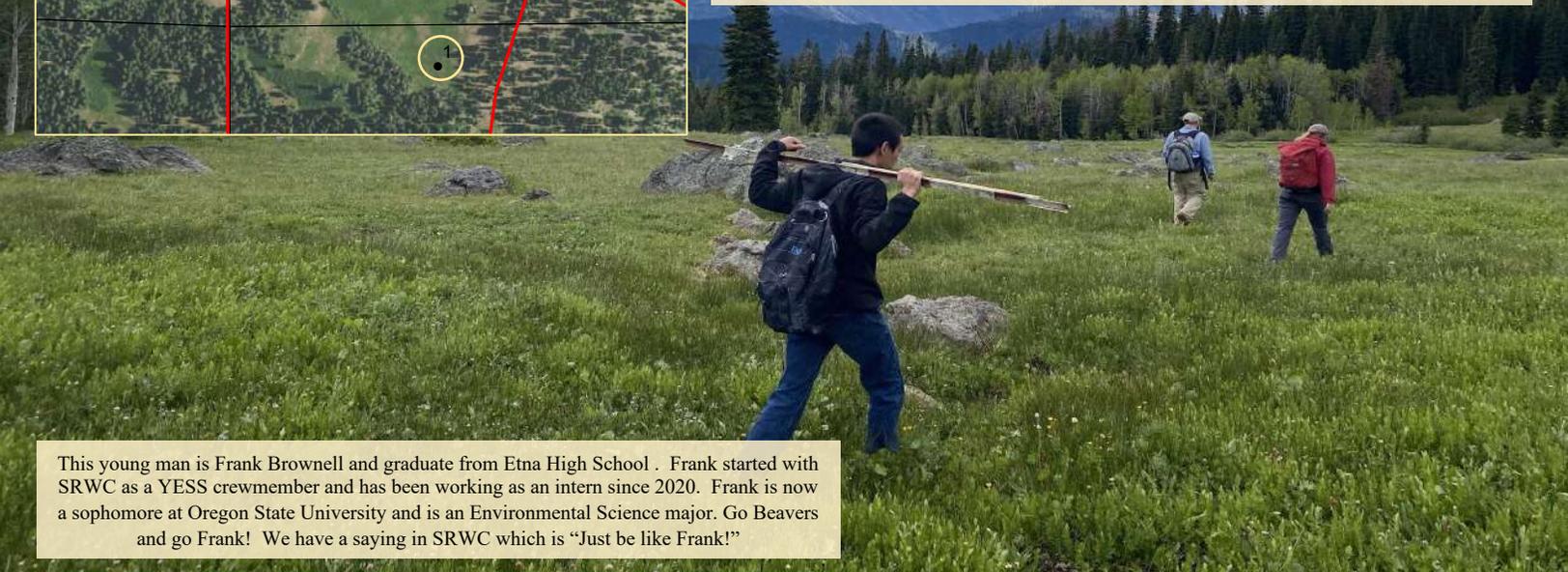
Big Meadow photo point network established in 2020



In 2020, SRWC established 72 photo points at 8 locations to help establish change over time due to the various land management actions such as conifer removal within the aspens and exclusionary cattle fencing.

To view the entire photo point series, please visit www.scottriver.org/big-meadows-photo-points

With Covid, the YESS crew consisted of one crew member (Frank Brownell) and one crew leader. Although the crew was small, they continued the tradition of removing the Marlahan Mustard and collected the data from the aspen transects.



This young man is Frank Brownell and graduate from Etna High School . Frank started with SRWC as a YESS crewmember and has been working as an intern since 2020. Frank is now a sophomore at Oregon State University and is an Environmental Science major. Go Beavers and go Frank! We have a saying in SRWC which is “Just be like Frank!”



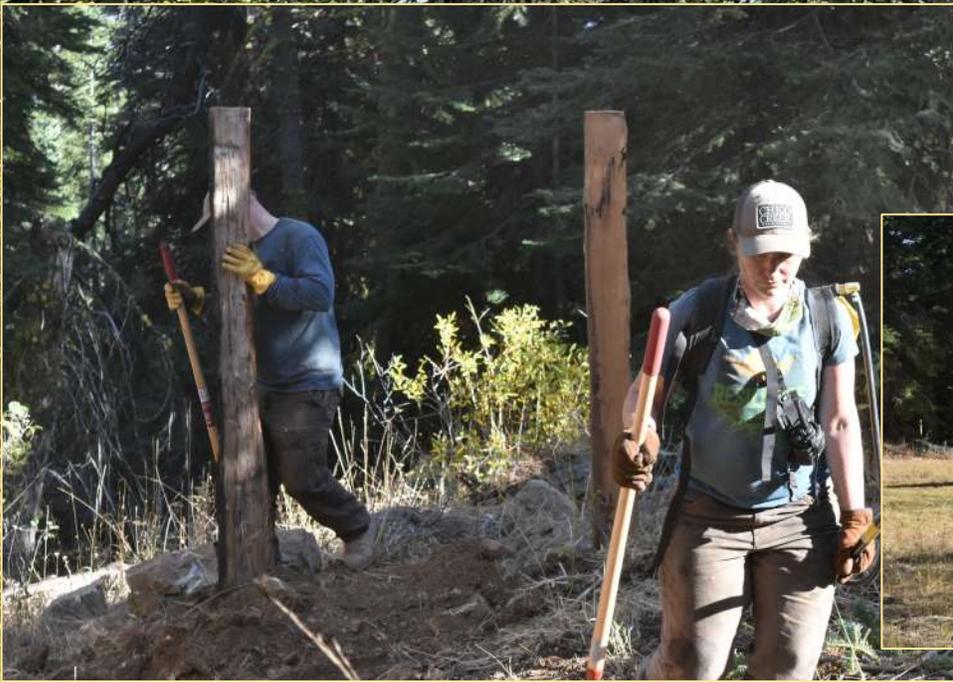
In the summer of 2020, EFM with the assistance from Jefferson Resource Company hired a local logging company, Pat Johnson Logging to remove conifer, specifically *Abies concolor*, commonly known as white fir, a coniferous tree in the pine family Pinaceae, from approximately 10 acres within the aspen stand area. The conifers in and around the outside of the aspen stand. [Click here to see a good video of how this type of tree removal done.](#)

An additional 6.6 acres were treated using a hand crew, creating over 100 hand piles which were subsequently burned in the fall of 2021. The larger conifer trees within the unit were girdled to cause premature mortality. "Timber!"



Hand piles ready for burning

Unfortunately, 2020 experienced extreme drought and due to fire danger concerns, much of the late summer and early fall, no work was able to be done and therefore most of the fencing building activities did not begin until after September 30, 2020. Using a rubber-tired excavator, SRWC & North River Construction installed the H-braces, gate posts, and inline posts. The posts were fire recovery cedar posts were used and were locally purchased by Jack Smiley, a local hardworking youth for Scott Valley. [To view the winter of 2020/2021, click here.](#)

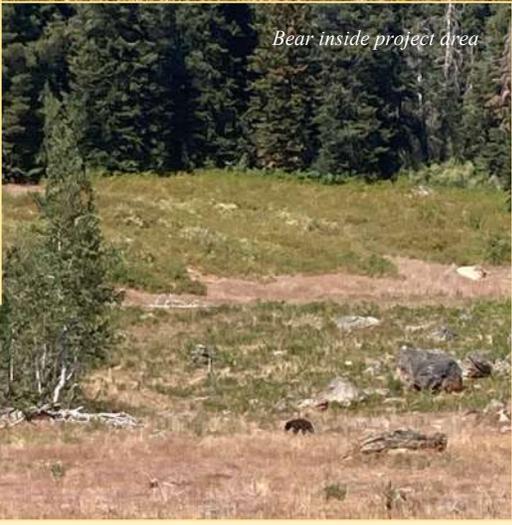


In mid-July 2021, prior to cattle being turned out onto neighboring allotments on the adjacent Klamath National Forest land, SRWC and the YESS crew installed a single strand of high-tensile electric fence. This fencing strategy was selected to reduce the impact on wildlife while keeping cattle excluded. The fence was powered by a portable electric fence charger. Bear and deer were both observed inside the enclosure using game cameras and field observations. SRWC staff monitored the fence weekly, checking the fence for cattle and breaks in the fence. Qualitative observations showed fence line contrast from heavy grazing outside of the fence line vs. inside the fence line (see photo below) and aspen recovery with less browsing impact.



Deer inside the project area. Photo taken by game camera.

54F 07/30/2021 07:10AM CAMERA1



Bear inside project area



Fence line contrast. The left side is inside the fence, and the right side is outside.



Wanting to see Big Meadows during the winter months?

[Here is a great video from January 1st to June 28th 2021](#)



Big Meadows Photo Points 1h, July 29, 2020



Big Meadows Photo Points 1h, August 4, 2021



Big Meadows Photo Points 1h, August 2, 2023



On November 12, 2021, the Siskiyou Prescribed Burn Association (SPBA) with assistance from SRWC and Quartz Valley Indian Reservations conducted a burn in Big Meadows and successfully burned 102 hand piles and the numerous log decks created in 2020. The consumption rate was better in the smaller hand piles with over 90% consumption however the larger decked logs did not have the same success, leaving approximately 40% of the material unburned.



[Check out Big Meadows from January 1st to June 28, 2021](#)

← Could it be a Franklin's bumble bee?

Franklin's Bumble Bee (*Bombus franklini*) was last seen in 2006 by Dr. Robin Thorp a distinguished emeritus professor of entomology at the University of California, Davis, but was documented to inhabit the beautiful Big Meadow systems. Franklin's Bumble Bee has the most limited geographic distribution of any bumble bee in North America and possibly the world (Williams 1998). On September 23, 2021, the United States Fish and Wildlife Service listed the Franklin's Bumble Bee as an endangered species in Douglas, Jackson and Josephine Counties in Oregon and in Siskiyou and Trinity Counties in California.

Williams, P. H. 1998. An annotated checklist of bumble bees with an analysis of patterns of description (Hymenoptera: Apidae, Bombini). Bulletin of the Natural History Museum, London (Ent.) 67: 79-152. updated at: www.nhm.ac.uk/research-curation/projects/bombus/



During the summer of 2022, the 5th YESS crew, lead by our amazing Jenn Rogge, continued the tradition of pulling Marlahan Mustard, collected data on the aspen transect and helped reinstall the electric, exclusionary fence. This crew also looked for different pollinators including the infamous Franklin's Bumble Bee. The next page is a summary of some work by Luna Buchin, a YESS crewmember.





Tuber Starwort



Flea Banes/horseweeds



Naked Buckwheat



American Bistort



Dwarf Larkspur



Sulfur Buckwheat



Arrowhead Butterweed



Woolly Sunflower



Beardtongue



Mule Ears



Sitka Valerian



Bog Saxifrage



Torrey's Blue Eyed Mary



Slender Cinquefoil



Yarrow



Slender Phlox

Big Meadows is an extremely diverse place. It not only provides habitat for animals but for plants as well, and many of them at that. Over the summer of 2022, there was a small survey done to see how many flower species there were blooming in that meadow.

Within just a few hundred feet of each other there totaled to be 40 different species of flowers. Some medicinal, some edible, and some very toxic to humans. The edible ones include; Mule Ears, Wintercress, Buckwheat, White Bog Orchid, Twisted Stalk, Shooting Star, Tuber Starwort, Saxifrage, Water leaves, Tiger Lily, Lupines, Indian Paintbrush, Cinquefoil, Yarrow, Checkermallow, Valley tassels, Willowherb, Selfheal, and Yellow Triteleia. The medicinal ones are; Horseweed, Columbine, and Sitka Valerian. The inedible ones are; Torrey's Blue Eyed Mary, Toothed Owl's Clover, Beardtongue, Slender Phlox, Woolly Sunflower, Buttercups, Sneezeweed, Prairie flax, Elegant piperia, Butterweed, Sweet pea, and Royal Sky Pilot.

All of these plants have one main thing in common though. They supply a huge pollination ground for our bees, butterflies, and hummingbirds. In addition to countless other advantages which include providing habitat for caterpillars and other insects. One of the most notable flowers that were blooming up there this past year was Horseweed. It is very crucial because of the nectar they provide for monarch butterflies in the fall when they are migrating. However, all the plants up there are important, they each provide something significant. Whether it's the Mule's Ears that help prevent erosion or if it's the Lupins and the high fiber and protein they contain which can benefit us greatly. The list could go on and on, but the main takeaway should be that we need to take care of what's around us because it continues to take care of us.



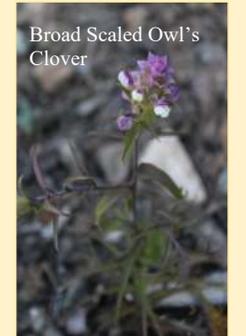
Common Selfheal



Sneezeweed



Arnica



Broad Scaled Owl's Clover

Luna Buchin

Luna's Plant List & Photos

Citizen science from some of the best

Jay and Terri Thesken, life-long naturalist, have hiked and enjoyed the Klamath mountains for many decades. On July 2, 2022, the Theskens visited the Big Meadows complex and here a few of their findings. Thank you!!

Edible	Edible	Medicinal	Non-Edible
Mule Ears	White Bog Orchid	Horseweed	Torrey's Blue Eyed Mary
Wintercress	Shooting Star	Columbine	Toothed Owl's Clover
Naked Buckwheat	Tuber starwort	Sitka valerian	Slender Phlox
Twisted stalk	Saxifrage	Brooklime	Beardtongues
Water leaves	Tiger Lily		Woolly Sunflower
Lupines	Cinquefoil		Buttercups
Paintbrushes	Yarrow		Sneezeweed
Checkermallow	Valley tassel		Prairie flax
Willowherb	Selfheal		Elegant piperia
Yellow triteleia	Marsh hedgenettle		Butterweed
American Bistort	Sulfur Buckwheat		Sweet pea
Monkey faces			Sky Pilot
			Dwarf larkspur



Trillium grandiflorum



Polemonium carneum
Jacobs ladder



Penstemon procerus
Whorled penstemon



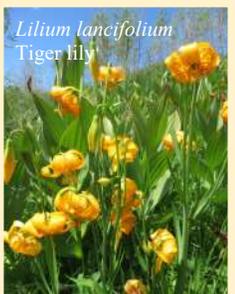
Sidalcea sp.
Checker mallow



Aphyllon purpureum



Frasera speciosa
Monument plant



Lilium lancifolium
Tiger lily



As the spring thaw melted the remaining snow from an above average snow year ([see Klamath National Forest Snow Survey Report](#)), SRWC staff made it's first site visit on June 1, 2023. Life was already bustling in the meadow area with several large bears foraging, not seeming to care too much about the visitors. Click here to watch the 2022/2023 winter in action from a timelapse camera that captured photos from September 30, 2022 to June 1, 2023: [Check out the winter of 2022/2023](#)

Meadow Coordinator, Megan Ireson and ED, Charmna Gilmore, taking a photo with one of several bears seen this beautiful day.

Klamath Bird Observatory (KBO) partnered with EFM and SRWC to use standardized bird monitoring techniques to quantify avian response to high elevation aspen and meadow restoration. Birds are widely recognized as excellent ecological and management indicators because they are closely associated with different components of vegetation structure and composition, they respond quickly to habitat change at multiple spatial scales, and they are relatively easy and cost-effective to monitor. During three post-restoration survey visits during the 2023 breeding season, we recorded 38 bird species during point count and area search surveys, and an additional 11 birds on species checklists only.

The most abundant species at point count locations were Oregon Junco, Warbling Vireo, Dusky Flycatcher, American Robin, and Mountain Chickadee. The most abundant species in aspen stand area search plots were Oregon Junco, House Wren, Warbling Vireo, Mountain Chickadee, and Western Wood-Pewee. A total of 5 species (Cassin's Finch, Evening Grosbeak, Mountain Quail, Olive-sided Flycatcher, and Rufous Hummingbird) on the Partners in Flight Yellow Watch List for species of continental concern. There is no bird conservation plan written specifically for high elevation meadows or aspen stands in northwestern California, but Lincoln's Sparrow - which is relatively abundant at Big Meadows - is considered to be a focal species for wet meadows in the Partners in Flight conservation plan for landbirds in western Oregon and Washington (Altman and Alexander 2012), which is applicable to this geography. A more detailed report summarizing differences in the bird community at Big Meadows before restoration (2019) vs. relatively soon after restoration (2023) is planned for later this year. Additional survey years may also be desirable to distinguish between short-term and long-term effects of aspen and meadow restoration at this site.

On June 20, 2023, SRWC staff and the YESS Crew (Cohort 7) made one of many trips to the site, removing the first of the Marlahan Mustard plants that were emerging and then working to clear fallen woody debris in and around the aspen stands, hand piling the material that will be burned later this year. Some piles are left for wildlife.



Species list of all birds detected during field work days, whether within a standardized point count or area search survey period or not (alphabetical order).	
Common Name	Scientific Name
American Goldfinch	<i>Spinus tristis</i>
American Robin	<i>Turdus migratorius</i>
Anna's Hummingbird	<i>Calypte anna</i>
Audubon's Warbler	<i>Setophaga coronata auduboni</i>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Brown Creeper	<i>Certhia americana</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Cassin's Finch	<i>Haemorhous cassinii</i>
Cassin's Vireo	<i>Vireo cassinii</i>
Chipping Sparrow	<i>Spizella passerina</i>
Clark's Nutcracker	<i>Nucifraga columbiana</i>
Common Raven	<i>Corvus corax</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Downy Woodpecker	<i>Dryobates pubescens</i>
Dusky Flycatcher	<i>Empidonax oberholseri</i>
Evening Grosbeak	<i>Coccothraustes vespertinus</i>
Fox Sparrow	<i>Passerella iliaca</i>
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Green-tailed Towhee	<i>Pipilo chlorurus</i>
Hairy Woodpecker	<i>Dryobates villosus</i>
Hammond's Flycatcher	<i>Empidonax hammondi</i>
Hermit Thrush	<i>Catharus guttatus</i>
Hermit Warbler	<i>Setophaga occidentalis</i>
House Wren	<i>Troglodytes aedon</i>
Lazuli Bunting	<i>Passerina amoena</i>
Lincoln's Sparrow	<i>Meiospiza lincolni</i>
MacGillivray's Warbler	<i>Geothlypis tolmiei</i>
Mountain Chickadee	<i>Poecile gambeli</i>
Mountain Quail	<i>Oreortyx pictus</i>
Mourning Dove	<i>Zenaida macroura</i>
Nashville Warbler	<i>Leiothlypis ruficapilla</i>
Northern Flicker	<i>Colaptes auratus</i>
Olive-sided Flycatcher	<i>Contopus cooperi</i>
Orange-crowned Warbler	<i>Leiothlypis celata</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Pine Siskin	<i>Spinus pinus</i>
Purple Finch	<i>Haemorhous purpureus</i>
Red Crossbill	<i>Loxia curvirostra</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Steller's Jay	<i>Cyanocitta stelleri</i>
Turkey Vulture	<i>Cathartes aura</i>
Warbling Vireo	<i>Vireo gilvus</i>
Western Tanager	<i>Piranga ludoviciana</i>
Western Wood-Pewee	<i>Contopus sordidulus</i>
White-headed Woodpecker	<i>Picoides albolarvatus</i>
Wilson's Warbler	<i>Cardellina pusilla</i>
Yellow-rumped Warbler	<i>Setophaga coronata</i>

In 2020, SRWC established 72 photo points to help establish change over time due to the various land management actions such as conifer removal within the aspens and exclusionary cattle fencing. To view the entire photo point series, please visit www.scottriver.org/big-meadows-photo-points



BMPP 1a, July 29, 2020

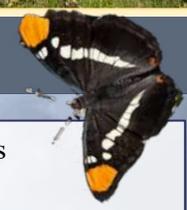


BMPP 1a, August 2, 2021



BMPP 1a, August 2, 2023

More great citizen science from some retired gurus



Field Note – Butterfly Surveys in and around Big Meadows Prepared by Caitlin Bean

On July 14 and August 2, 2023, Dianne Keller and I conducted butterfly surveys in and around Big Meadows Complex located at about 6,000 feet in elevation in the Shackleford Creek watershed in Scott Valley, California. Each survey started at around 10:00 AM, temperatures were above 70 degrees F, and there was minimal if any, breeze and/or clouds.

On the July 14th survey, the species identified were observed on Big Meadows Road in Klamath National Forest. They were primarily documented at and around wet areas along the road where they were clustered at the edge of mud puddles. We started our survey from about 1/2 miles shy of the trailhead to Big Meadows and, traveling down in elevation, stopped to survey several seepy areas. As you can see from the species list, we documented high diversity during this survey with a total of 38 species observed. This is likely because these surveys were targeted to areas where butterfly activity was high and, in addition, by the time we returned many wildflower species were past their peak, and butterfly activity in the meadow was quite low.

On the August 2 survey, Dianne and I surveyed within the cattle exclusion fencing zone located in Big Meadows complex on private timber property. This is the area where many meadow restoration activities are being implemented by SRWC. Due to the delay between the two surveys, most of the wildflowers in the meadow were already past their prime by the second survey. As you can see from the species list, we only observed 17 species that day, and two of those species (mourning cloak and sacheem) were observed at two different seeps on the road down to Quartz Valley.

Both of us would love a chance to see the meadow again when the wildflower bloom is peaking. A butterfly survey during peak bloom should provide a pretty good idea of baseline butterfly biodiversity. Baseline data would be very useful in terms of assessing the effects of restoration on butterfly biodiversity over time. We both really appreciated the opportunity to see Big Meadows!

Thank you.



Caitlin Bean, a retired CDFW biologist and Dianne Keller, is a retired GIS specialist for BLM and was the lead for setting up standardized butterfly survey in the Cascade Siskiyou National Monument, a national butterfly biodiversity hotspot.

See Caitlin and Dianne's comprehensive list on the following page.

Butterfly species observed near (07/14/2023) and in (08/02/2023) Big Meadows, Siskiyou County, CA

Survey Crew - Caitlin Bean and Dianne Keller

"x" - observed during the survey

"?" - could not verify but most likely this species

Scientific name	Common name	7/14/2023	8/2/2023
SKIPPERS			
Spread wing skippers			
Erynnis icelus	Dreamy duskywing		
Erynnis propertius	Propertius duskywing	?	
Pyrgus communis	Common checkered skipper		
Pyrgus ruralis	Two-banded skipper		
Grass/Folded-wing Skippers			
Ochlodes agricola	Rural skipper	x	
Carterocephalus paleamon	Arctic skipper	x	
Ochlodes sylvanoides	Woodland skipper		
Polites sonora	Sonoran skipper		x
Atalopedes campestris	Sachem		x
Hesperia (comma complex)	Silver-spotted skipper		
Hesperia juba	Yuba skipper		
SWALLOWTAILS			
Parnassius clodius	Clodius parnassian	x	
Papilio zelicaon	Anise swallowtail	x	
Papilio rutulus	Western tiger swallowtail	x	x
Papilio multicaudata	Two-tailed swallowtail	x	
Papilio eurymedon	Pale swallowtail	x	x
WHITES AND SULPHURS			
Neophasia menapia	Pine white	x	x
Pontia beckerii	Becker's white		
Pontia occidentalis	Western white	x	
Pieris napi	Grey-veined white		
Pieris rapae	Cabbage white		
Colias erytheme	Orange sulphur		
Colias philodice eripyle	Yellow sulphur	?	?
Colias erytheme X philodice	hybrid		
Anthocaris sara sara	Sara orange tip		
Euchloe ausonides	Large marble		
Pieris marginalis	Margined white	x	
Anthocharis lanceolata	Grey marble	?	
GOSSAMER WINGS/LYCAENIDAE			
Coppers			
Lycaena xanthoides (editha)	Edith's copper		
Lycaena gorgon	Gorgon copper		
Lycaena helloides	Purplish copper		
Lycaena nivalis	Lilac-bordered copper	x	x
Lycaena arota	Tailed copper		
Lycaena heteronea gravenotata	Blue copper		
Hairstreaks			
Satyrrium saepium	Hedgerow hairstreak		
Mitoura nelsoni	Nelson's hairstreak		
Callophyrus gryneus	Cedar hairstreak	x	
Mitoura spinetorum	Thicket hairstreak		
Strymon melinus	Grey hairstreak		x
Elfins			
Callophrys mossi or fotis	Moss's elfin		
Incisalia eryphon	Western pine elfin		
Blues			
Agriades podarce	Sierra Nevada blue		
Euphilotes enoptes	Pacific dotted blue	x	x
Plebejus "idas" ricei cross	Anna's blue	x	x
Plebejus sacpiolis	Greenish blue	x	
Plebejus icarioides	Boiduval's blue	x	x
Plebejus acmon	Acmon blue	x	
Plebejus lupini	Lupine blue		
Agriades glandon	Glandon blue		
Everes amyntula	Western tailed blue	x	
Glaucopsyche piasus	Arrowhead blue	x	
Glaucopsyche lygdamus	Silvery blue		
Celastrina argiolus echo	Spring azure	x	
BRUSHFOOTS/NYMPHALIDEA			
Danaus plexippus	Monarch		
Fritillaries			
Boloria epithore	Pacific fritillary		
Speyeria coronis	Coronis fritillary		
Speyeria zerene conchyliaius	Zerene fritillary	x	
Speyeria callope (rupestris)	Callippe fritillary		
Speyeria egleis (oweni)	Great Basin fritillary	x	
Speyeria atlantis (dodgei - melanic)	Atlantis fritillary		
Speyeria mormonia	Mormon fritillary	x	x
Speyeria hydaspe purpurascens	Hydaspe fritillary	x	x
Admirals			
Limenitis lorquini	Lorquin's admiral	x	x
Ladies			
Adelpha bredowii californica	California sister	x	
Vanessa virginiensis	American lady		
Vanessa cardui	Painted lady	x	
Vanessa annabella	West coast lady		x
TortoisesHELLS			
Nymphalis californica	California tortoiseshell	x	
Nymphalis milberti furcillata	Milbert's tortoiseshell		
Nymphalis antiopa	Mourning cloak		x
Anglewings and Commas			
Polygonia gracilis	Hoary comma	x	
Polygonia faunus rusticus	Green comma		
Polygonia zephyrus	Zephyr comma		
Precis coenia	Common buckeye		
Checkerspots and crescents			
Chlosyne hoffmanni segregata	Hoffmann's checkerspot	x	
Euphydryas chalcedona (wallacensis)	Chalcedon's Checkerspot	x	
Euphydryas editha (edithana)	Edith's checkerspot		
Phycoides campestris	Field crescent	x	x
Phycoides mylitta	Mylitta crescent	x	
Phyciodes orseis	California crescent	x	
Satyrs, browns, ringlets			
Cercyonis pegala	Common wood nymph	x	
Coenonympha tullia	ochre ringlet		
Total species recorded per survey		38	17



Funding Resources

Since 2017, SRWC has received the following resources to help support the work shared in this report.

United States Fish and Wildlife Service
\$86,190

Rocky Mountain Elk Foundation
\$15,000

Wildlife Conservation Society
\$6,684

This does not account for EFM's investment to remove the large conifer in 2020 nor does it account for funding for the YESS crew that is supplied by the Klamath National Forest. The work done by KBO was supplied by other revenue streams

Future Work

The SRWC will continue to work with the landowner to reduce the impacts of undesired cattle browse.

SRWC sees the Klamath National Forest as an important partner in future high mountain meadow restoration efforts and will continue to encourage adherence to the terms of the permits on the public lands as an important component of recovery of these critical areas.

SRWC plans to remove conifers in aspens stands in the future, all while trying to document and monitor our impacts of restoration activities. To help support this work, SRWC received the additional funding for the coming years.

United States Fish and Wildlife
\$90,893

California Department of Fish and Wildlife is also funding SRWC to do watershed scale planning and design work which will include the Big Meadow Complex. This will allow landscape level assessment work and will inform future restoration actions within these important areas of the Scott River watershed.



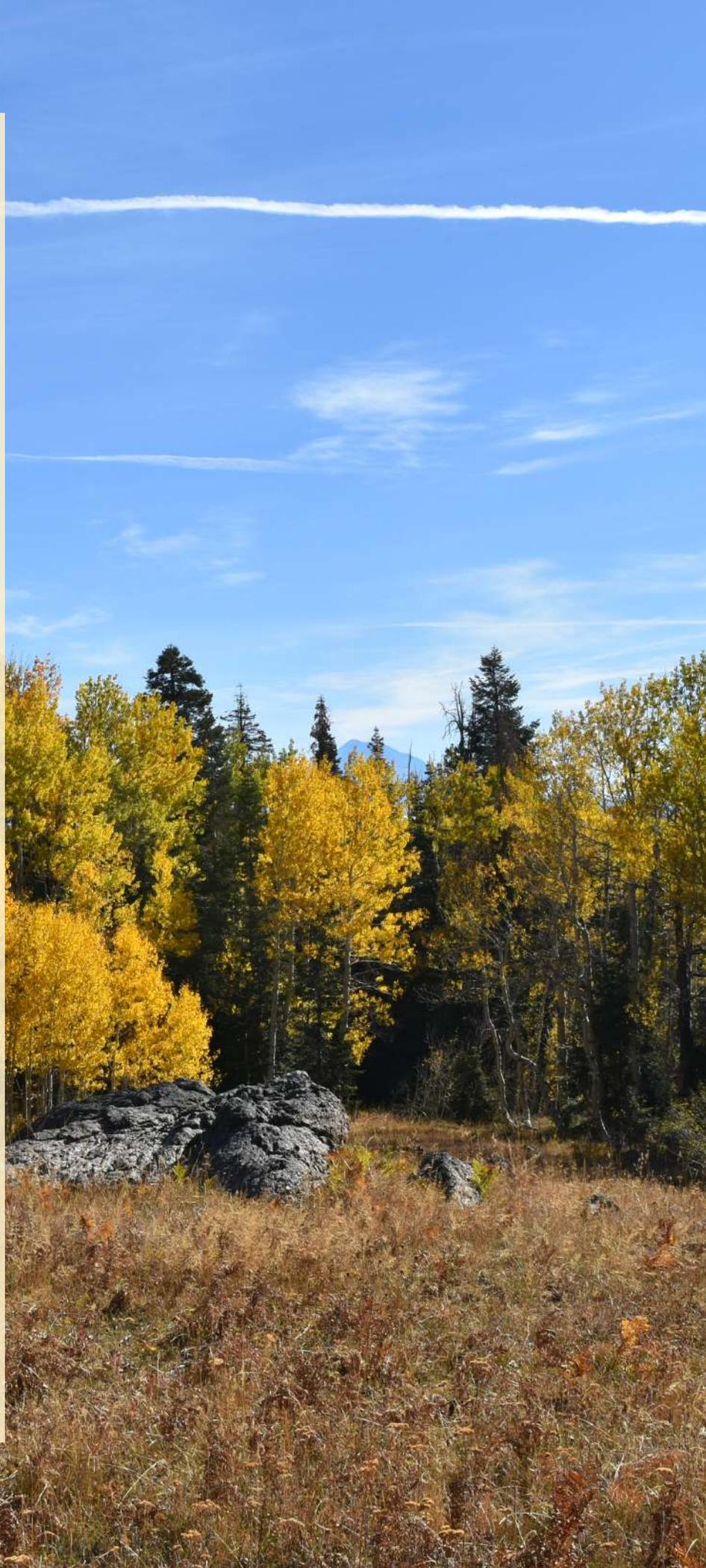
Interesting Facts on Aspen

- Our favorite friend and keystone species, beaver, love aspen.
- The largest living organism in the world is an aspen. Pando, a 106-acre aspen clone lives in the Utah, Clones, called ramets and are genetically identical make up this massive living being and is believed to weigh approximately 13 millions pound!
- The quake in the Quaking aspen comes from the leaves attach to branches via a long and flattened petiole, coupled with a leaf that cups to one side, allowing even the slightest breeze causes the leaves to flutter.
- The white bark is one identifying characteristic of this tree, but the bark is special for more than just its unique appearance. The bark layer of quaking aspens carries out photosynthesis, a task usually reserved for tree leaves.
- Quaking Aspen may have some medicinal uses. The inner bark was used as an antiscorbutic, a diaphoretic, a diuretic, an expectorant, a febrifuge, a purgative, and a vermifuge. It was also used as a poultice for sore eyes.

There is a lot of work to help understand the importance of aspen and the role they play in the Western United States. A great resource for additional information and scientific studies is provided by the Western Aspen Alliance (WAA), a joint venture between Utah State University's College of Natural Resources, numerous state and federal agencies and an international array of scientists focused on aspen communities.

Visit WAA's website at:

<https://qcnr.usu.edu/western-aspen-alliance/>





SRWC proudly gives a shout out to all the animals, bugs, and plants who call Big Meadows home



A sincere thank you to all our project partners, including but not limited to EFM, Klamath National Forest, United States of Fish & Wildlife Service, California Department of Fish & Wildlife, Quartz Valley Indian Reservation, Jefferson Resource Company, and to science collectors, both our youth and citizen scientists, all who have contributed to our understanding of this amazing and critical area.

