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Comments: The Siskiyou Chapter Native Plant Society of Oregon (SCNPSO) would like to take the opportunity to provide comments for the Oak Knoll Range Project Environmental Assessment. As native plant lovers with an intimate knowledge of native plants and plant communities within the Oak Knoll Range Project area, the SCNPSO is pleased to add our own knowledge and perspectives to strengthen the planning process.

[ldquo]The Klamath-Siskiyou ecoregion is considered a global center of biodiversity (Wallace 1982), an IUCN Area of Global Botanical Significance (1 of 7 in North America), and is proposed as a World Heritage Site and UNESCO Biosphere Reserve (Vance-Borland et al. 1995). The biodiversity of these rugged coastal mountains of northwestern California and southwestern Oregon has garnered this acclaim because the region harbors one of the four richest temperate coniferous forests in the world (along with the Southeastern Conifer forests of North America, forests of Sichuan, China, and the forests of the Primorye region of the Russian Far East), with complex biogeographic patterns, high endemism, and unusual community assemblages.[rdquo] -World Wildlife Fund

SCNPSO is a non-profit organization based in Ashland, Oregon. We formed for charitable, educational and scientific purposes, namely the preservation, conservation, and study of the native plants and vegetation of Oregon, including the Siskiyou Mountains, and public education about the values of native flora and its habitat. We promote ecologically appropriate land management on public land that enhances native plant communities and maintains intact habitat. We are dedicated to providing public land managers with detailed public comments for projects that may have a detrimental impact to native plant communities due to the introduction of invasive plant species, and/or harmful impacts to rare or endangered species, unusual plant assemblages, and intact native plant communities.

SCNPSO[rsquo]s board and members regularly recreate and botanize on Forest Service land in the Oak Knoll Range Project area. Some of our members reside in Siskiyou County, California.

SCNPSO Supports the No Action Alternative

The No Action Alternative as defined on page 14 of the Oak Knoll Range Project Environmental Assessment is the only alternative that will adequately protect native flora, including endemic, rare and endangered species in the Oak Knoll Range Project.

[ldquo]Under the no action alternative, grazing would no longer be authorized on federal lands within the East Beaver, Hornbrook, and Ash Creek Allotments and the adaptive management strategy that is currently implemented in these allotments (see proposed action for description) would be discontinued. Other ongoing management activities not associated with grazing would continue.[rdquo]

The SCNPSO supports the No Action Alternative above all else. We believe that ending cattle grazing on the Siskiyou Crest is one of the most important actions that the Klamath National Forest can take to protect the world-class botanical diversity of the Siskiyou Crest as well as important pollinator and wildlife habitat. We encourage the KNF to choose the No Action Alternative and discontinue grazing allotments within the Oak Knoll Range Project Final Decision.

Over 100 Years of Grazing on the Siskiyou Crest

Forest Service documents confirm that as early as 1918 the Siskiyou Crest was overgrazed. In Silver Fork Basin massive, unsightly and damaging terraces had to be bulldozed across the upper basin in order to control the

erosion caused by overgrazing. Former Forest Service employee Robert Webb reported [ldquo]No feed at Silver Fork.[rdquo] He remembered the Forest Service replanting [ldquo]the area time after time[rdquo] trying to get grass to grow in the damaged basin. In 1965, the Forest Service put in an irrigation system to cultivate 2.5 acres of grass (Frank, 1995). Finally in the late 1960s the upper basin was terraced with bulldozers to mitigate the impacts of grazing and the erosion it produced (Frank, 1995). The impacts to native plant communities during the height of grazing on the Siskiyou Crest were severe, and that damaging legacy still exists today. Contemporary cattle numbers, passive season long grazing, drift from the KNF and a lack of management (e.g. herding) has compounded these impacts and hindered recovery of native plant communities.

According to Stories on the Land (Frank, 1995), in 1903, 103,000 sheep and 7,500 cattle grazed the Siskiyou Crest between Siskiyou Summit and Hwy 199. C.E. Brown, in his 1971 Forest Service document, History of the Rogue River National Forest, Vol. II, explained that in 1918 12,000 sheep were permitted between Studhorse and Donomore. Brown[rsquo]s comment regarding grazing during this time period: [ldquo]At the end of the season the whole area was a dust bed.[rdquo] https://foresthistory.org/wp-content/uploads/2017/01/HISTORY-OF-THE-ROGUE-RIVERNATIONAL-FORESTvol2.pdf

Aerial photos taken in 1939 show rill and gully erosion in denuded areas across the Siskiyou Crest (USDA, 2005). Rill and gully erosion is still a major issue on the Siskiyou Crest. With continued cattle grazing it will continue to erode native plant habitat and degrade ecosystem function.

Long-Term Rest is Needed

The native plant communities within the Oak Knoll Range Project area are in need of long-term rest in order to recover from 100 years of intensive cattle grazing. Ten years of rest is needed for these overgrazed areas to begin the recovery process. The reality is that it is unknown what botanical treasures may have been extirpated during the past century of grazing. We know little of what the historic condition was in some areas, and there could have been endemic species extirpated, or common species that no longer occur in specific areas, but are common in nearby ungrazed areas. Our collective lack of knowledge should lead to the tendency to err on the side of caution when introducing non-native animals in the form of livestock grazing, that can further impact the world-class botanical diversity of the Siskiyou Mountains. At a minimum, at least ten years of rest is needed for ecosystem recovery for the benefit of native plant communities, as well as pollinator and wildlife habitat.

Modern, active grazing management, especially rest-rotation grazing and regular herding, must be implemented in order to avoid unacceptable levels of degradation of water quality, riparian areas and wetlands, and to protect special status native species. [ldquo]Rest-rotation[rdquo] consists of cessation of grazing in areas where grazing is having negative impacts in order to allow the area to recover. Regular herding will help move the livestock around the allotment to prevent livestock from congregating in one area for so long that excessive damage occurs in any one location.

The Forest Service and BLM[rsquo]s publication, Riparian Area Management, has a section on [ldquo]Grazing Management for Riparian-Wetland Areas,[rdquo] that includes [ldquo]Cardinal Rules for Planning and Managing Livestock Grazing in Riparian Areas,[rdquo] including:

* Identify and implement alternatives to passive, continuous grazing
* Employ rest or deferment from livestock grazing whenever appropriate
* Implement frequent (sometimes daily) supervision by the parties involved once management is in progress, so that adverse impacts (e.g., trampling damage and excessive utilization) can be foreseen and avoided.

Grazing Impacts on Native Plants

Livestock grazing not only diminishes the ability of native plants to reproduce due to cattle eating flowers and preventing seed development, but it also drastically alters the composition of native plant communities on a large scale. Common species may become rare without the ability to reproduce, and rare species may be reduced to very small numbers or be extirpated from an area completely when livestock grazing occurs.

Although rare, uncommon, and endemic species are deserving of extra attention and analysis in the Oak Knoll Range Project area, common native plant species that are the cornerstone of plant communities should not be ignored in the analysis process, as the alteration of common species may have the greatest impact on the myriad of non-vascular plants, wildlife, invertebrates, and mycorrhiza that depend on them for their own reproduction or existence. A common species such as alpine shooting star (Primula tetrandra), is a larval host plant for the Sierra Nevada butterfly (Plebejus podarce spp. klamathensis), a sensitive species in Oregon within the area where cattle drift is occurring.

According to https://www.butterfliesandmoths.org/species/Plebejus-podarce, [ldquo]the meadow habitat of subspecies podarce in California may be negatively affected by trampling from grazing cattle and hikers.[rdquo]

Direct impacts to native plants due to livestock grazing include the following:

* When livestock eat flowering plants they no longer have the ability to be pollinated or set seed.
* When native flowering plants are unable to flower it diminishes available forage for their obligate pollinator, thereby impacting the population of their pollinator in the future, and possibly setting back their ability to be pollinated until grazing ceases.
* The inability of native plants to set seed will lead to a loss of food for birds, rodents, and invertebrates that rely on native seeds for food, and it will also diminish seed dispersal for plant regeneration that these species provide.
* When native plants are prevented from setting seed, the [ldquo]increaser[rdquo] species will then dominate a plant community until grazing ceases. Species that increase with disturbance will dominate and species that have slower or less vigorous reproduction will decrease.
* Soil compaction and soil degradation caused by grazing changes the location where many native plant species can grow; therefore, native plant locations and composition is altered.
* Livestock trampling native plants can kill the plants when the species is delicate or sensitive, or when the trampling is so severe or concentrated that the area is denuded of all vegetation.
* Altered hydrological function in grazed areas impacts the ability of native plants to survive based on their specific moisture needs. In areas where altered hydrology leads to soil compaction and the inability of water to infiltrate, many plants will succumb to a lack of water. Formally moist meadows within the Oak Knoll Range Project area now have denuded dry areas where only dryland plants survive because of altered hydrology and soil compaction.
* Livestock contribute to the spread of invasive plants into intact native plant communities.
* The Oak Knoll Range Project area has many invasive species of concern that, if allowed to spread, will negatively impact healthy plant communities.
* Livestock grazing can negatively impact water quality. Many native plants have specific ater quality needs, and some won[rsquo]t grow in degraded water, specifically aquatic species.
* Livestock trampling of rodent tunnels prevents the natural function of rodents to move ative plant species around in the ecosystem, specifically geophytes (e.g. bulbs, corms, ubers, etc.).

Livestock Eat Differently than Native Ungulates

Grazing cattle eat and move around the Oak Knoll Range Project area in a much different way than native wildlife does. Non-native cattle eat very different plants than native wildlife, as determined in Diet Overlap and Social Interaction Among Cattle Deer and Elk in the Cascade-Siskiyou National Monument, Southwest Oregon (2007, Hosten, Whitridge, Broyles) https://www.blm.gov/or/resources/recreation/csnm/files/dietoverlap.pdf, when fecal

analysis studies were performed to further understand the impacts of livestock grazing on the Monument.

Fecal analysis from animals within the Cascade-Siskiyou National Monument showed that wetland plants comprise 45% of cattle fecal matter; whereas, deer and elk show very little wetland plants in their fecal matter. A similar study is needed in the Oak Knoll Range Project area but it is likely that similar results would be found. The results of this study show that wetland plants are preferred by cattle and should receive special attention during the analysis process.

The EA failed to consider the impacts of livestock grazing on sensitive species.

The EA failed to consider the effects of continued livestock grazing on sensitive plant species. Numerous rare and unusual plant species are found in the area, including within designated Botanical Areas specifically designed to protect botanical values. Currently, management of Botanical Areas is falling short due to livestock grazing impacts.

The Oak Knoll Range Project EA claims that many sensitive plant species only grow in locations that do not support livestock grazing (rock outcrops, barrens, serpentine sites, etc.), but this assumption is an over-generalization that is unsupported by Forest Service monitoring data. An assumption that sensitive plant species that grow outside of wet meadows aren[rsquo]t being impacted by cattle grazing is not supported by any data, it is merely an assumption. Cattle do trample areas that support sensitive species that prefer dryland, serpentine, or rocky habitat. We have photo documentation of cattle grazing within a population of Jayne[rsquo]s canyon buckwheat (Eriogonum diclinum). Habitat for this species is diminished due to cattle trampling and erosion of soils.

In the drift area, in the Silver Fork Basin the only population of Calochortus nudus (shasta star tulip) in Oregon was potentially extirpated by grazing impacts. Carex pseudoscirpodiea was also historically found in the area, but is presumed extirpated or nearly extirpated due to cattle impacts. These impacts are particularly important because the species were found in the upper basin inside a designated Botanical Area and adjacent to the KNF where cattle drift often occurs.

The EA failed to adequately analyze the impact of grazing on designated Botanical Areas.

The Observation Peak, Big Red Mountain and Mt. Ashland/Siskiyou Peak Botanical Areas are located within the East Beaver Allotment on the KNF. On the RRSNF, three Botanical Areas, including Observation Peak, Dutchman Peak and Big Red Mountain Botanical Areas are located within the identified [ldquo]drift[rdquo] area. The Oak Knoll Range Project EA failed to adequately analyze or disclose the potential impacts from livestock grazing on these important land use allocations.

On the RR-SNF, the stated goal of Botanical Areas in the Land and Resource Management Plan (LRMP) is to [ldquo]Protect and enhance exceptional botanical values[rdquo] and [ldquo]Encourage compatible scientific, educational, and recreational use.[rdquo] Livestock grazing, especially unauthorized grazing in the form of cattle [ldquo]drift[rdquo] from the KNF, does not represent a [ldquo]compatible scientific, educational and recreational use,[rdquo] nor does it serve to [ldquo]protect and enhance the exceptional botanical values.[rdquo] In fact, it serves to disproportionally degrade the botanical resource and impact the [ldquo]scientific, educational and recreational use[rdquo] of these important Special Interest Areas.

According to the 1990 LRMP the goal of designated Botanical Areas is to, [ldquo]Protect and enhance exceptional botanical values. Encourage compatible scientific, educational and recreational uses.[rdquo] Cattle grazing will not protect or enhance botanical values, neither is it listed as a [ldquo]compatible[rdquo] use. Grazing in Botanical Areas is inconsistent with the LRMP.

The 1990 LRMP also directed, [ldquo]When conflicts exist between botanical area management and other resources, the conflict will be resolved in favor of the botanical resource.[rdquo] Livestock grazing is clearly a conflict with Botanical Area management and the maintenance of relatively natural plant communities; therefore, the [ldquo]conflict[rdquo] should be resolved in favor of the botanical resource.

The Standards and Guidelines in the 1990 LRMP for range management in Botanical Areas are listed below:

1. Livestock grazing will be controlled in order to benefit or maintain the botanical resource. This control can range from limited or no livestock grazing to seasonal adjustments to benefit the target species. Forage utilization standards will be based on this direction.
2. Range Improvements and vegetation manipulation will not be permitted unless they will benefit the botanical resource. No exotic species will be seeded or placed in botanical areas.
3. Provide fences and stock control devices when necessary to protect resources.
4. Provide annual permittee plans for livestock distribution and use patterns which reflect management direction.
5. Write range allotment plans to reflect management direction for all lands within the allotment boundary. Allotment planning process procedures are documented in FSM 2210.
6. Develop Coordinated Resource Management Plans where possible and feasible to facilitate the integrated resource management of range and other resources and between agencies, permittees and other landowners.

It is important to note that the RRSNF Forest Plan directed the agency to produce site specific management plans for all designated Botanical Areas. By and large, these plans were never produced, except for the Dutchman Peak Botanical Area. Because the required management plans were never produced on a site-by-site basis as directed, the Dutchman Peak Botanical Area Management Plan should be utilized to identify management direction and activities appropriate for Botanical Areas on the Siskiyou Crest. The Dutchman Peak Botanical Area Management Plan states, [ldquo]Livestock grazing will be controlled in order to benefit or maintain the botanical resource. This control can range from limited or no livestock grazing to seasonal adjustments to benefit the target species. Forage utilization standards will be based on this direction. Range improvements and vegetation manipulation will not be permitted unless they benefit the botanical resource. No exotic species will be seeded or placed in a Botanical Area. Provide fences and stock control devices when necessary to protect floral resources[rdquo] (USDA. 2005).

Despite this very clear direction for Botanical Areas on the RRSNF, nothing in the Oak Knoll Range EA provides management direction specific to Botanical Areas that would control livestock for the benefit of botanical resources, identify forage utilizations standards appropriate for Botanical Areas, or provide fences, exclosures, or other forms of stock control devices that would protect botanical resources. Essentially, nothing in the EA acknowledges a need for specific management protocol based on the Standards and Guidelines for Botanical Areas. This is a violation of the Forest Plan and is inconsistent with Botanical Area management.

The issue is particularly troubling because the KNF Forest Plan states, [ldquo]Special Interest Areas on the Siskiyou Crest will be managed jointly with the Rogue River National Forest.[rdquo] Despite this requirement, the KNF is allowing cattle drift onto the RRSNF that is inconsistent with applicable Standards and Guidelines for Botanical Areas. The KNF is also failing to manage their own Botanical Areas consistent with the KNF Forest Plan.

The current action alternatives in the Oak Knoll Range EA fail to identify management activities that will effectively limit or reduce drift in the future. The EA also fails to identify how the KNF intends to manage grazing in designated Botanical Areas for the benefit of botanical resources or in a manner consistent with standards and guidelines in the RRSNF or KNF Land & Resource Management Plan.

On the KNF, Botanical Areas were established specifically for botanical conservation and to protect intact or unusual plant populations and plant communities. The Forest Plan requires management to be [ldquo]compatible

with the goals and objectives of the Special Interest Area.[rdquo] Based on actual effects, passive, season long grazing fails to demonstrate compatibility. In fact, both the current management and the proposed management identified in the Oak Knoll Range EA disproportionately impacts the very botanical resources designated for protection.

Both the KNF and RRSNF Forest Plans require management activities in Botanical Areas to benefit the botanical resource. The Forest Plans envision site specific management within Botanical Areas, yet the Oak Knoll Range Project EA provides absolutely no specific management direction for Botanical Areas and completely fails to disclose how management activities proposed in the Oak Knoll Range Project will benefit the botanical resource.

The currently proposed Oak Knoll Range EA violates the RRSNF and KNF Forest Plans and fails to demonstrate compatibility with designated Botanical Areas; therefore, the SCNPSO can only support the No Action Alternative.

Special Status Plants Within the Oak Knoll Range Project Area

The project area straddles the border between California and Oregon, making it important to analyze the grazing impacts to not only species that are rare, sensitive, or uncommon in California, but also in Oregon where cattle drift is occurring on a regular basis. The lists below represent what the SCNPSO is aware of, but there may be many more species of concern, especially lesser-known aquatic and non-vascular species that may not be listed here.

Grazing is a chronic issue and needs careful management in order to protect rare and special plants. Special status plants need buffers in grazing allotments, just like they receive in other management projects such as timber sales, fuels treatments, hiking trail construction, fireline construction, etc. The SCNPSO supports full buffers for special status plant species. These buffers should be in place for each known occurrence in all grazing allotments. These buffers may include buck and rail fencing or herding methods that keep the cattle away from known special status plant site, or other forms of cattle exclosure.

Special Status Plants

Oregon

Pacific silver fir (Abies amabilis)

Siskiyou onion (Allium siskiyouense)

Vanilla grass (Anthoxanthum nitens spp. nitens formally Hierochloe odorata in Calflora)

Alaska cedar (Callitropsis nootkatensis)

Split hair paintbrush (Castilleja schizotricha)

Slender-flowered evening primrose (Camissonia graciliflora)

Sierra nerved sedge (Carex nervina)

Single spiked sedge (Carex scirpoidea ssp. pseudoscirpoidea) (Almost extirpated now, on a slope

in upper Silver Fork Basin on the north side of Observation Peak below the PCT)

Tall bugbane (Cimicifuga elata)

Small-fruit clarkia (Clarkia heterandra)

Milo Baker[rsquo]s cryptantha (Cryptantha milobakeri)

Clustered lady[rsquo]s slipper (Cypripedium fasciculatum)

Red larkspur (Delphinium nudicaule)

Few-flowered bleedinghearts (Dicentra pauciflora)

Bolander[rsquo]s monkeyflower (Diplacus (Mimulus) bolanderi)

Siskiyou willowherb (Epilobium siskiyouense)

Siskiyou daisy (Erigeron cervinus)

Cliff daisy (Erigeron petrophilus var. petrophilus)

Lobb[rsquo]s buckwheat (Eriogonum lobbii)

Mountain bunch fescue (Festuca viridula)

Newberry[rsquo]s gentian (Gentiana newberryi)

Henderson[rsquo]s horkelia (Horkelia hendersonii)

Bush beardtongue (Keckiella lemmonii)

Lee[rsquo]s lewisia (Lewisia leeana)

Mt. Ashland lupine (Lupinus lepidus var. ashlandensis)

Howell[rsquo]s lousewort (Pedicularis howellii)

Rhizome bluegrass (Poa rhizomata)

Quaking aspen (Populus tremuloides) (Although not rare, it is uncommon on the Siskiyou Crest

and is badly damaged by livestock grazing).

Applegate stonecrop (Sedum oblanceolatum)

Drooping bulrush (Scirpus pendulus)

Parish[rsquo]s nightshade (Solanum parishii)

Howell[rsquo]s tauschia (Tauschia howellii)

California (Those also on OR list not included)

Shasta arnica (Arnica venosa)

California lady[rsquo]s slipper (Cypripedium californicum)

Mountain lady[rsquo]s slipper (Cypripedium montanum)

Jaynes canyon buckwheat (Eriogonum diclinum)

Siskiyou fritillary (Fritillaria glauca)

Howell[rsquo]s lewisia (Lewisia cotyledon var. howellii)

Wiggins[rsquo] lily (Lilium pardalinum ssp. wigginsii)

Siskiyou mountain owl[rsquo]s clover (Orthocarpus cuspidatus spp. cuspidatus)

Slender bog orchid (Plantanthera stricta)

Ledge stonecrop (Rhodiola integrifolia) (although not listed, this is the only population in the Siskiyou Mountains)

Marshall[rsquo]s gooseberry (Ribes marshallii)

American saw wort (Saussurea americana)

Cascade stonecrop (Sedum divergens)

Yellow triteleia (Triteleia crocea var. crocea)

Henderson[rsquo]s triteleia (Triteleia hendersonii)

Siskiyou false hellebore (Veratrum insolitum)

Non-Vascular Plants

The following rare bryophytes may need special attention to retain viable populations if grazing is authorized. Special attention may mean exclusions, exclosures, fencing, light grazing, effective herding or discontinued use.

* Calypogeia sphagnicola in a wetland at Middle Hell
* Cephaloziella spinigera at Mud Springs
* Bruchia bolanderi (Mud Springs & Middle Hell)

[ldquo]If managed inappropriately, grazing can severely degrade ecosystems (Bilotta et al. 2007) by substantially altering the structure, diversity, and growth habits of a plant community and the associated insect community (Debano 2006a, 2006b; Kruess and Tscharntke 2002a; Zhu et al. 2012). Livestock grazing can alter plant communities by reducing biomass, selecting for or against plant species, changing the plant community structure (physical and species composition), and by affecting the reproductive capacity of plants (e.g., seed production, dispersal). Grazing systems that remove a high level of forage, and have livestock in a given pasture for extended periods of time and do not provide long rest periods can cause plant community shifts towards invasive plants, that are both less palatable to ungulates and less suitable habitat for native pollinators (Vavra et al. 2007; Knight et al. 2009; Kobernus 2011; Hanula et al. 2016). Grazing can also alter hydrology and soils, increasing

bare ground, erosion, and compaction. Moreover, grazing can cause direct mortality to pollinators through destruction of bee nest sites or trampling of immobile stages of butteries and moths (Sugden 1985; Kearns and Inouye 1997; Gess and Gess 1999; Bonte 2005).[rdquo]

-Best Management Practices for Pollinators on Western Rangelands

Best Management Practices for Pollinators on Western Rangelands

The Oak Knoll Range Project EA makes no mention of Best Management Practices (BMPs) for pollinators within the proposed grazing allotments. The project[rsquo]s final decision should include a hard look at the Xerces Society[rsquo]s publication: Best Management Practices for Pollinators on Western Rangelands, available at the following link: https://xerces.org/sites/default/files/2019-09/18-015_BMPs%20for%20Polls%20on%20Western%20Rangelands_sml_9-12-2019%20%281%29.pdf

[ldquo]The response of pollinators to livestock grazing and many other management practices in the West has been largely unstudied, and more research is needed to further refine rangeland management for pollinators. Given imperfect and incomplete knowledge, adaptive management using the best currently available science is necessary. Adaptive management is an iterative process of decision-making which acknowledges uncertainties and encourages balancing shortterm benefits with learning about the system in order to improve management in the long-term. Experiment on small areas, keep records, and share what works and what fails with others. Monitor vegetation and, when possible, the pollinators themselves to see how they respond to management.[rdquo] (page 19)

BMPs listed in Best Management Practices for Pollinators on Western Rangelands that should be considered and analyzed further in the Oak Knoll Range Project:

* If a drought severely suppresses wildflower blooms one season, grazing it heavily may further stress pollinators[rsquo] ability to find sufficient nectar and pollen. To help minimize the effects of interacting stressors, you may need to adjust grazing pressure in years of drought. (page 19)
* In general, keep grazing periods short, with recovery periods for at least one-third of the habitat area relatively long (e.g., months to years depending on the habitat type). (page 25)
* High-density short-duration (HDSD), low AUMs, and/or rest-rotation are recommended for maintaining habitat for pollinators. (page 25)
* Managers should aim for utilization rates up to but not exceeding 40% of the current season[rsquo]s growth to reduce impacts to pollinators (Kimoto et al. 2012b) and to the native forb component of plant communities. Forty percent is a rule-of-thumb, but land managers should work closely with local wildlife biologists and botanists to determine site-specific percent utilization and stubble heights that will maintain forb diversity and abundance for pollinators from frost to frost. (page 28)
* Avoid grazing the same location at the same time every year (e.g., alternate the timing of grazing within an allotment). (page 28)
* In a rotational grazing scheme, the area excluded from grazing would change every year to maintain habitat heterogeneity, avoid overutilization of any given area, and to maintain oral resources for pollinators (Scohier et al. 2012). (page 29)
* After unplanned high utilization occurs (in excess of 40% utilization), livestock should be excluded from the area for at least a year or more[mdash]based on monitoring of the vegetation[mdash]to allow the habitat time to recover. (page 30)

Larval Host Plants and Impacts to Native Plant Pollinators

The relationship between native plants and their pollinators is inextricably linked. Specialization in nature is the norm and many pollinators have specific native plants that they have evolved with over the millennia, and they

will not survive without that mutualistic relationship. The spectacular botanical diversity of the Klamath-Siskiyou Ecoregion, therefore, means that there is also world-class diversity in pollinators too [mdash] the two go hand in hand.

The size of a pollinator often correlates to the size and shape of a flower, as well as the lifecycle correlating to the bloom time of the plant they have evolved to use for food and/or as a larval host plant. The SCNPSO encourages the KNF to fully address the needs of native plant pollinators in the Final Decision of the Oak Knoll Range project.

The KNF would benefit from contracting out some of the invertebrate surveys that are needed to get detailed and correct information regarding the pollinators that are present in the Oak Knoll Range project planning area, and what native plants those pollinators and invertebrates rely on for their food and lifecycle. The KNF may not have the capacity to do this detailed work that requires an intimate knowledge of invertebrate identification [ldquo]in house.[rdquo]

Please keep in mind that direct trampling and eating of eggs and larvae on their host plants during the livestock grazing season is of major concern for the health of pollinator/native plant relationships.

A selected list of native butterflies that most likely occur in the Oak Knoll Range Project area, and their larval host plants is as follows:

Butterflies:

[bull] American painted lady (Vanessa virginiensis) uses pearly everlasting (Anaphalis margaritacea) or pussytoes (Antennaria spp.)

[bull] Painted lady (Vanessa cardui) uses uses native thistles (Cirsium spp.), lupines (Lupinus spp.) and fiddleneck (Amsinckia menziesii)

[bull] Western tiger swallowtail (Papilio rutulus) uses cottonwood (Populus trichocarpa), aspen (Populus tremuloides), willows (Salix spp.), wild cherry (Prunus spp.), and ash (Fraxinus latifolia)

[bull] Two-tailed swallowtail (Papilio multicaudata) uses ash (Fraxinus latifolia) and chokecherry (Prunus virginiana)

[bull] Pale tiger swallowtail (Papilio eurymedon) uses Ceanothus species

[bull] Anise swallowtail (Papilio zelicaon) uses plants in the Apiacea family, including: (Lomatium spp.), (Heracleum maximum), (Angelica arguta), (Ligusticum spp.), (Osmorhiza spp.), (Perideridea spp.), (Sanicula spp.).

[bull] California tortoiseshell (Nymphalis californica) uses deerbrush and other Ceanothus species

[bull] Clodius parnassian (Parnassius clodius) used bleeding heart (Dicentra formosa)

[bull] Red admiral (Vanessa atalanta) use stinging nettle (Urtica dioica)

[bull] Snowberry checkerspot (Euphydryas colon) uses snowberry (Symphoricarpos albus)

[bull] Mylitta crescent (Phyciodes mylitta) uses native thistles (Cirsium spp. such as C. occidentalis)

[bull] Lupine/Boisduval's blue (Plebejus icarioides) uses Lupines (Lupinus spp.) and buckwheats (Eriogonum spp.)

[bull] Acmon blue (Plebejus acmon) uses buckwheats (Eriogonum spp.) etc.

[bull] Buckwheat blue (Plebejus lupini) uses buckwheats (Eriogonum spp.)

[bull] Zephyr anglewing (Polygonia gracilis) uses currants and gooseberries (Ribes spp.)

[bull] Sara's orangetip (Anthocharis sara) uses plants in the Brassicacea family, especially rockcresses (Arabis spp.)

[bull] Satyr anglewing (Polygonia satyrus) stinging nettle (Urtica dioica)

[bull] Ediths' checkerspot (Euphydryas editha) uses: paintbrush (Castilleja spp.), (Penstemon spp.), lousewort (Pedicularis spp.), owl's clover (Orthocarpus spp.), and Chinese houses (Collinsia spp.)

[bull] Sierra nevada/Arctic blue/Gray blue (Plebejus podarce spp. klamathensis) uses alpine shooting star (Primula tetrandra or Dodecatheon alpinum), and Sierra shooting star (Primula jefferyi or Dodecatheon jeffreyi)

Of particular interest is the Sierra nevada (Plebejus podarce spp. klamathensis) due to its rarity and reliance on high elevation meadows that contain shooting stars that are commonly grazed. Linda Kappen, local butterfly enthusiast and naturalist, found the Sierra nevada butterfly at Bigelow Lakes in what is now the Oregon Caves National Monument, just one year after the Big Grayback grazing allotment was closed. Just one year after grazing cessation the butterfly was sighted and documented. Could this be because the cessation of grazing allowed for the overwintering larvae to feed on shooting stars that would have otherwise been grazed and destroyed? It is unknown. What is known, however, is that Linda recently observed the same butterfly at Silver Fork Basin, an area within the range of known drift from the Oak Knoll Range Project area (Linda Kappen, personal communication). She has also observed them in Cow Creek Glade.

Because the Sierra nevada butterfly is a sensitive species, and because it has a very restricted habitat and larval host plant, this species is in need of full analysis, and its native host plant, alpine and Sierra shooting stars, need buffers and protection within the Oak Knoll Range Project area. After researching this species it is clear that all references to the Sierra nevada butterfly[rsquo]s conservation status mention livestock grazing as one of the main impacts to its survival and population.

[ldquo]Adults of this species fly in a single annual brood, from late June to early August, depending on local conditions (Warren 2005). Pyle (2002) notes that this species rarely flies in June or September. In Oregon, it has been documented from June 21st to August 10th, with the vast majority of records in July. Males visit mud and both sexes visit flowers, often nectaring on flowers of small plants including yellow composites and bistort (Opler et. al. 2006). The eggs of this species are laid singly on leaves, bracts, or sepals of the host plant (Opler et. al. 2006). Hibernation takes place in the caterpillar or chrysalis stage (Opler et. al. 2006). Larval foodplants in Oregon have not been reported, but shooting stars (Dodecatheon jeffreyi and D. alpinum) are the larval foodplants in the Trinities and Sierra Nevada of California[rdquo] (Pyle 2002, Warren 2005). -Species Fact Sheet

Many bee, fly and beetle pollinator species also rely on specific native plants for their food and reproduction. Worth mentioning are native grasses that can be heavily impacted by livestock grazing. Many bumble bee species will use the root mass of native grasses for their brood during the flowering season, and for overwintering queens. Many ground nesting bee species can be impacted by cattle trampling and soil compaction.

Additionally, many butterfly species use native grasses as larval host plants, so it is important that they

don[rsquo]t all get chewed down and eaten by livestock on grazing allotments in the Oak Knoll Range Project area.

The following butterflies that likely occur in the planning area use native grasses for larval host plants:

* California ringlet (Coenonympha tullia California)
* Sylvan/Great Basin wood nymph (Cercyonis sthenele silvestris)
* Juba skipper (Hesperia juba)
* Rural skipper (Ochlodes agricola)
* Woodland skipper (Ochlodes sylvanoides)
* Great arctic (Oeneis nevadensis)

The following species of butterfly use willows (Salix spp.) as larval host plants and should be given special consideration if found in the project area since willow habitat along streams and wetlands are heavily degraded from livestock grazing in the planning area.

* Sylvan hairstreak (Satyrium sylvinum) uses willow (Salix spp.)
* Lorquin's admiral (Limenitis lorquini) uses willow (Salix spp.)
* Mourning cloak (Nymphalis antiopa) uses willow (Salix spp.)

Franklin's Bumble Bee: Franklin's bumble bee is now listed on the California state endangered species list, but it may be extinct. Dr. Robbin Thorp last observed it in 2006 in a subalpine wet meadow on Mt. Ashland off Road 20. While the known range of this endemic bee was relatively restricted, it was until recently common in the Klamath-Siskiyous. Reducing or halting grazing along the Siskiyou Crest may give this rare species a chance to recover, if any remain.

Nonnative Invasive Plants

The Forest Service makes a concerted effort to clean machinery and deal with invasive species when implementing other management projects such as road maintenance, road construction, timber sales, fuels management, and even under the crisis situation of wildland firefighting;however, the chronic spread of invasive plants due to livestock grazing is given very little attention. Invasive plants within the Oak Knoll Range Project area will continue to spread without management changes in regard to livestock grazing within the four grazing allotments in the planning area.

Many invasive species that occur on the [ldquo]home ranches[rdquo] of permittees can easily be transferred from the home ranch into the federal allotments on public land by livestock.

A selection of plants from invasive species lists for both Oregon and California that occur in the project area, and on/adjacent to home ranches are as follows:

* Wild oat (Avena fatua)
* Cheatgrass (Bromus tectorum)
* Meadow knapweed (Centaurea debeauxii)
* Starthistle (Centaurea solstitialis) along Beaver Creek can be introduced to areas high up in the watershed by livestock in the Beaver-Silver allotment. Also occurs on home ranches.
* Spotted knapweed (Centaurea stoebe ssp. micranthos)
* Canada thistle (Cirsium arvense)
* Bull thistle (Cirsium vulgare)
* Non-native hound[rsquo]s tongue (Cynoglossum officinale) is found around Ward[rsquo]s Fork despite years of effort on the part of the Forest Service to eradicate the species.

* Scotchbroom (Cytisus scoparius)
* Teasel (Dipsacus fullonum)
* Medusahead (Elymus caput-madusae)
* Ratttail grass (Festuca myuros)
* St. Johnswort (Hypericum perforatum)
* Dyer[rsquo]s woad (Isatis tinctoria)
* English plantain (Plantago lanceolata)
* Sulphur cinquefoil (Potentilla recta) (Near the BLM corral on lower Beaver Creek is a source of spread into the Beaver-Silver allotment.)
* Sheep sorrel (Rumex acetosella)
* Bouncing bet (Saponaria officinalis)
* Mullein (Verbascum Thapsus)

Dryland Habitat and Cattle Barrens

SCNPSO would like to make a special mention of the importance of dryland habitat that includes native bunchgrass, dry meadows, flower-filled dry ridgelines, and buckwheat fields where dryland species find their niche. Livestock grazing has altered historic bunchgrass communities over the past 100 years, diminishing both the acreage and complexity of bunchgrass habitat on the Siskiyou Crest. Livestock routinely turn dry areas into dusty [ldquo]cattle barrens[rdquo] where only [ldquo]increaser[rdquo] species can survive and spread.

Although these areas are dry, they still suffer from soil compaction, erosion and degradation from overgrazing, impacting native plant communities and their associated pollinator populations that thrive in dry habitats. Many diminutive and sensitive plants that are easily crushed grow on the rocky, sandy, or gravelly substrates that have become cattle barrens. These dryland habitats are also where high levels of endemic and rare species of native plants occur. With long-term rest many former bunchgrass sites can recover [mdash] such as cattle barrens surrounding Slaughterhouse Flat and Lowden Meadows [mdash] but the sooner they have rest the better.

In the dry portions of headwater meadow ecosystems passive continuous grazing also devastates native bunchgrasses that are particularly sensitive to repeated grazing during a single grazing season. That is why the Natural Resources Conservation Service (NRCS) recommends that deferred rotation, rest rotation, and intensive deferred rotation are grazing systems that are appropriate for native bunchgrasses, but passive continuous grazing is not appropriate because it results in native bunchgrasses being eliminated from the preferred locations where, livestock which is not herded, remain for long periods. NRCS Grazing Management Guidelines for Native Bunchgrasses: https://efotg.sc.egov.usda.gov/references/public/WA/WA-RANGE-TN34_1109.pdf

In areas where native bunchgrasses have been largely eliminated, soil erosion has taken place and young, flammable conifers have replaced native bunchgrasses, increasing fuel loads and impacting habitat. According to [ldquo]Effects of Livestock Grazing on Stand Dynamics and Soils in Upland Forests of the Interior West,[rdquo] (https://www.fs.fed.us/rm/pubs/rmrs_gtr292/1997_belsky.pdf) livestock also alter forest dynamics by reducing the biomass and density of understory grasses and sedges, which otherwise outcompete conifer seedlings and prevent dense tree recruitment. Grazing by domestic livestock has thereby contributed to increasingly dense western forests and to changes in tree species composition.

Climate Change

The Oak Knoll Range Project EA failed to adequately address climate change and the potential for cattle grazing to exacerbate the effects of climate change in subalpine meadows already experiencing less snowfall and hydrological changes. While the effects of a warming climate in our region are unknown, scientific models indicate that rainfall may increase and that snowpack in the Siskiyous will decrease. Since subalpine habitats are already fragile, allowing or reintroducing cattle grazing during a changing climate will likely accelerate the loss of

biodiversity and resilience.

Long-term studies and vegetation monitoring across national forests indicate that grazing is progressively drying out wetlands and damaging the sponge-like water holding capacity of headwater basins. The mechanism for this degradation is wetland trampling by poorly managed cattle and other livestock year after year. Without including the analysis of climate change, the Oak Knoll Range Project EA failed to adequately analyze impacts to the projected alteration of hydrological function in headwater basins from livestock grazing in combination with climate change.

Thank you for the opportunity to comment on this important project.