

**CONSERVATION AGREEMENT between the
U.S. Fish and Wildlife Service and the U.S. Forest Service for
the Mt. Ashland lupine and Henderson's horkelia**



October 2002

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I. Introduction

The Mt. Ashland lupine (*Lupinus lepidus* [Dougl. ex Lindl.] var. *ashlandensis* [B.J. Cox] Isely) and Henderson's horkelia (*Horkelia hendersonii* T.J. Howell) are designated as Species of Concern by the U.S. Fish and Wildlife Service (FWS). The purpose of this conservation agreement is to reduce the threats to these species. When implemented, this conservation agreement is expected to provide protection for these species across their entire range. Full implementation of this conservation agreement is expected to reduce threats to Mt. Ashland lupine and Henderson's horkelia that may otherwise warrant listing as endangered or threatened under the Endangered Species Act of 1973, as amended (ESA)(16 U.S.C. § 1531 et seq.).

II. Geographic area and management agencies included in this conservation agreement

This conservation agreement covers the known populations of these two species across their entire ranges in the Siskiyou Mountains of southwestern Oregon and northwestern California. The Mt. Ashland lupine is confined to Mt. Ashland, Jackson County, Oregon. Populations of the Henderson's horkelia extend from Mt. Ashland west to Dry Lake Lookout, Siskiyou County, California, and include populations on Dutchman Peak, Observation Peak and Jackson Gap. The geographic area occupied by the Mt. Ashland populations of both species totals approximately 76 acres (30.8 hectares). Additional geographic areas occupied by Henderson's horkelia include approximately another 100 acres (40.6 hectares) [acreage estimates include inclusions of brush, rock, and unoccupied habitat for both species]. All known populations of both species occur on National Forest system lands on the Klamath and Rogue River National Forests. Accordingly, this conservation agreement applies only to Federal lands that are occupied by these species and where management directly impacts these two species. Maps of the known locations of Mt. Ashland lupine and Henderson's horkelia are included in Appendix A.

Management Agencies

U.S. Fish & Wildlife Service

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U.S. Forest Service (USFS)

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2. Margaret Boland, Forest Supervisor
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Interested parties

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III. Authority, purpose, objective, and management goal of this conservation agreement

The authority for the FWS to enter into this voluntary conservation agreement derives from the Endangered Species Act of 1973, as amended; the Fish and Wildlife Act of 1956 (16 U.S.C. § 742a et seq.), as amended; and the Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.),

as amended. The authority for the USFS to enter into this voluntary conservation agreement derives from the Economy Act of 1932 (31 U.S.C. §1535, PL 97-258 and 98-216). The signatories understand that implementation of this conservation agreement is intended to reduce or eliminate existing threats to Mt. Ashland lupine and Henderson's horkelia. However, the conservation agreement shall not preclude any person or agency from listing or recommending the listing of Mt. Ashland lupine and/or Henderson's horkelia under the ESA.

The purpose of this conservation agreement is to formally document the intent of the involved parties to protect and conserve Henderson's horkelia and Mt. Ashland lupine and their habitat.

The objective of this conservation agreement is to provide a mechanism for the protection and conservation of Henderson's horkelia and Mt. Ashland lupine and their habitats on Mt. Ashland and extending west to Dry Lake Lookout in Siskiyou County, California.

The management goal is to maintain stable or increasing populations of Henderson's horkelia and Mt. Ashland lupine in areas covered by this conservation agreement.

Appendix B, Table 1 contains density data gathered from 1995, 1996, and 1997. These data were gathered from 25 permanent quadrants 0.5 x 50 meters that were established randomly in 5 areas on Mt. Ashland. The minimal detectable change using this strategy was 51 percent with the acceptable false change error = 0.2, miss change error = 0.1, and using a one-tailed test. A minimal detectable change of 30 percent would require 54 quadrants and a minimum detectable change of 20 percent would require 100 quadrants. This design was abandoned because the range of variation was too great to determine trends.

The natural variation of these populations is not known and is difficult to define. A new monitoring program was established (and initiated in 2001) using frequency data and ground cover estimates (see Appendix C) which incorporates a 10 percent chance of a missed change error and a 20 percent chance of a false change error for a two-tailed test. The current monitoring strategy is designed to detect a 15 percent absolute decline (as opposed to a relative decline) in the frequency of the plants within any particular sampling sector and an eight percent absolute decline in the overall sampled populations and will be used to determine what constitutes a stable population. A decline in the frequency of 20 percent or more from the established baseline within any individual sampling sector and a decline of 10 percent or more from the baseline within the entire sampled population will trigger management actions if the cause of the decline is known, or if further, intensive studies determine the cause of the decline. Monitoring data will be gathered every fifth year unless these thresholds are reached or exceeded. In that case monitoring will occur the following year.

The 1.0 m² quadrat sampling data from 2001 and 2002 (Appendix D, page 7), indicate that the Mt. Ashland lupine occurs at a frequency of 31.71 percent throughout its range and Henderson's horkelia occurs at a frequency of 29.81 percent throughout the sampled portion of its range. Sample results from future years will be compared against this baseline using a chi-square test.

A similar monitoring program will be established in the Dutchman Peak/Jackson Gap area to detect a 15 percent change in the frequency of the plants between the baseline and subsequent sampling periods. Monitoring data will be gathered every fifth year unless there is a 20 percent reduction in the cover value. In that case sampling would occur the following year at this monitoring site.

IV. Species concerned

Mt. Ashland lupine - *Lupinus lepidus* var. *ashlandensis*

In 1995 the Mt. Ashland lupine became a Species of Concern. It is a USFS Sensitive Species in Regions 5 and 6 and is listed as a candidate species by the Oregon State Department of Agriculture.

Taxonomically, Mt. Ashland lupine is considered a variety of dwarf lupine (*Lupinus lepidus*) (Family: Fabaceae) and appears to be most closely related to Torrey's lupine (*Lupinus lepidus* var. *sellulus*). The closest known occurrences of Torrey's lupine are on Sugarloaf Mountain (Josephine County, Oregon, 30 miles west of Mt. Ashland) and in the Scott Bar mountains (Siskiyou County, California, 20 miles southwest of Mt. Ashland). A different variety of dwarf lupine, known as crowded lupine (*Lupinus lepidus* var. *confertus*), occurs closer on serpentine ridges of Red Mountain six miles west of Mt. Ashland. Crowded lupine is also common in the high Cascades of southern Oregon and northern California. Two other unrelated lupines on Mt. Ashland are Brewer's lupine (*Lupinus breweri*) and white-stemmed lupine (*Lupinus albicaulis*).

Mt. Ashland lupine is one of the most narrowly restricted plants in the northwest. It is known from only one population, on the summit and the western flank of Mt. Ashland. The population occurs on about 43 acres (17.4 hectares) along the divide between the Rogue and Klamath River Basins, managed by both the Rogue River and Klamath National Forests. The best estimate of the number of individuals in the population was 36,000 from a partial census in 1991. Population estimates from 1995-1997 permanent belt transects ranged from about 71,000 to about 766,000, although this sampling method was discontinued due to high variability of population estimates.

Habitat for the Mt. Ashland lupine consists of open areas of decomposed granitic soil and subalpine forblands, along a ridge, summit, and upper slopes of Mt. Ashland. Occupied elevations range from 6860 to 7520 feet (2091 to 2292 meters). See Appendix E for photos of the Mt. Ashland lupine.

Henderson's horkelia - *Horkelia hendersonii*

Henderson's horkelia is a mat-forming rhizomatous perennial forb in the rose family (Family: Rosaceae). It is a Federal Species of Concern, a USFS Region 5 and 6 Sensitive Species, and it has no official state status in Oregon or California.

The known populations of Henderson's horkelia are restricted to the Siskiyou Crest area in Oregon from Mt. Ashland to Observation Peak. In addition, there is a small isolated population of Henderson's horkelia about eight miles south of Observation Peak, in California, near Dry Lake Lookout on the Klamath National Forest.

The largest population of Henderson's horkelia is on the summit and west ridge of Mt. Ashland. There is a large cluster of occurrences, both in acreage and numbers of individual plants, in the Dutchman Peak/Observation Peak area. At Mt. Ashland and the Dutchman Peak/Observation Peak area, individual plant numbers are estimated to be in the "thousands." Quantitative estimates of numbers of individuals are not possible because it is not feasible to determine which are individual plants among extensive mat areas with innumerable individual stems. Three populations along a ridge from Wagner Gap to McDonald Peak and southward are small. The Dry Lake Lookout population is very small.

Total acreage of all Henderson's horkelia populations is roughly 176.4 acres (71.4 hectares). The Mt. Ashland population is roughly 76.1 acres (30.8 hectares) and closely matches the Mt. Ashland lupine population area plus an extended area west of where the Mt. Ashland lupine grows.

Habitat for Henderson's horkelia includes open areas of coarse decomposed granitic soils, subalpine forblands, and dwarf shrublands. Populations are found along the higher peaks and ridges and upper slopes. Occupied elevations range from 6600 to 7520 feet (2000 to 2290 meters). See Appendix E for photos of the Henderson's horkelia.

Other species of interest

Howell's tauschia (*Tauschia howellii*) is a perennial forb in the carrot family. It occurs on deep coarse decomposed granite sandy or gravelly slopes in a number of patches one to two miles west of the area covered by this conservation agreement. This taxon was first collected by T. J. Howell on "Ashland Butte" in 1887. There is still apparently suitable habitat on Mt. Ashland, although currently there are no existing populations on Mt. Ashland. It is not known whether the original collections actually came from the known sites one to two miles west of Mt. Ashland, or if the Mt. Ashland occurrence was extirpated. This very rare plant is known from only a few small populations scattered in high elevation parts of Siskiyou County, California and Jackson County, Oregon. All populations total less than 5,000 individual plants on less than 50 acres (20 hectares). Most Howell's tauschia habitat has high potential for severe soil erosion from even minimal disturbance. Howell's tauschia would likely benefit from some kind of range-wide conservation agreement, it is not covered under this conservation agreement because it does not occur in any sites where the Mt. Ashland lupine and Henderson's horkelia occur. It is threatened by factors largely independent of agency management, and possible mitigation measures are unrelated to Mt. Ashland conservation issues.

Jayne's canyon buckwheat (*Eriogonum diclinum*) occupies the same area on Mt. Ashland as the

Mt. Ashland lupine and Henderson's horkelia, and extends beyond the area covered by these populations. It also occurs in the Dutchman Peak/Observation Peak and dry lake area and slightly overlaps some Henderson's horkelia sub-populations there. Measures to protect the Mt. Ashland lupine and Henderson's horkelia populations are likely to benefit these occurrences of Jayne's canyon buckwheat. This buckwheat occupies much more extensive areas on the Siskiyou Crest, and elsewhere in the Klamath Mountains, so the conservation agreement is not expected to be necessary for its statewide or range-wide viability.

V. Factors affecting status of the Mt. Ashland lupine and Henderson's horkelia

Summer recreation on Mt. Ashland: The mountain is heavily visited during the snow-free period by vehicles, tourists, picnickers, hikers, and bicyclists. Ground disturbance from all kinds of summer recreation activities has increased gradually over many years and is expected to continue to increase on parts of the mountain occupied by the Mt. Ashland lupine and Henderson's horkelia populations. The mountain's summit, which is accessed by dirt road, receives particularly heavy use. Another popular spot on the west ridge, known as "Rabbit Ears," is almost constantly used for day outings, camping, informal large gatherings and ceremonies. Both of these locations have concentrations of both Mt. Ashland lupine and Henderson's horkelia individuals. Loss of vegetation (including Mt. Ashland lupine and Henderson's horkelia plants) has occurred at these locations. Without mitigation, conditions at these particular spots are expected to worsen and expand. Similar effects may occur on additional parts of the populations.

In spite of a posted off-road vehicle (ORV) closure, mountain bikes, motorcycles, and four-wheel drive vehicles occasionally leave the roads and drive over the populations. In the late spring/early summer, when the snow is mostly but not entirely receded, drivers attempt to avoid snow banks on the road by driving off-road around them. Because the soil has no clay content and vegetation is sparse in the open areas, ORV use has a high potential for starting gullies which can cause eventual drying and loss of Mt. Ashland lupine and Henderson's horkelia habitat.

Winter recreation on Mt. Ashland: The Mt. Ashland Ski Area currently operates on the northeast slopes of the peak. One chairlift reaches the summit and delivers skiers and snowboarders near the northeastern edge of the Mt. Ashland lupine and Henderson's horkelia populations. Skiers and snowboarders, but not snow grooming machines, travel over the eastern part of the population area when skiing the "south side" of the mountain. Skiers and snowboarders also travel on the northeastern side of the population area to reach the west side of the bowl. There have been no studies to date to determine if the skiing activity is affecting the Mt. Ashland lupine and Henderson's horkelia or their habitat underneath the snowpack.

The USFS is currently conducting an environmental analysis of a proposal to expand the Mt. Ashland Ski Area. Some proposed activities would increase skiing, snowboarding, and snow fences over parts of the Mt. Ashland lupine and Henderson's horkelia populations that are currently used by skiers. There is concern that these activities may increase the pressure of the snowpack on dormant Mt. Ashland lupine and horkelia root crowns, change the longevity of the

snow pack, or otherwise affect the environment and habitat that currently supports these two species on 3.5 acres of Mt. Ashland. If changes in environmental conditions occurred as a result of these activities, it is not known if they would be beneficial, adverse, or neutral in their effect on Mt. Ashland lupine and Henderson's horkelia individuals. Based on informal observations, no adverse effects have been observed from three decades of skiing and snowboarding at the existing ski area (W. Rolle, pers. comm., July 15, 2002). However, there is concern that any change in the conditions that allowed the Mt. Ashland lupine and the Henderson's horkelia to persist here may add increased risk to these parts of the populations and the species' viability.

Recreation activity in the Dutchman Peak/Jackson Gap and McDonald Ridge population of Henderson's horkelia: In the Dutchman Peak/Jackson Gap area, moderate to heavy summer recreation use is confined to certain small areas near road turnouts with few Henderson's horkelia plants. Henderson's horkelia occurrences at Dutchman Peak/Jackson Gap area occupy 67.7 acres (27.4 hectares) (38 % of the total population area). A proposed trail along the McDonald ridge to Wagner Glade Gap would bring new visitors to two Henderson's horkelia occurrences that occupy roughly 6.2 acres (2.5 hectares) which is about 0.03 % of the total population area. The new trail would bisect less than 0.1 miles of habitat at these locations. Other occurrences of Henderson's horkelia are in areas that are not regularly visited by recreationists. Winter recreation use of all these areas is light and would not affect these populations.

Roads: A portion of the Mt. Ashland lupine and Henderson's horkelia populations were destroyed decades ago when the road to Mt. Ashland summit was constructed. Also, the easy access created by this road is largely responsible for Mt. Ashland summer recreation problems. Cutbanks and new drainage patterns created by the summit road have started gullies which could eventually severely impact the populations of both species. Road widening, inadequate or improper maintenance, or new road construction could cause more habitat loss, although no new roads are proposed.

Some Henderson's horkelia plants were probably lost when the roads in the Dutchman Peak/Jackson Gap area were constructed decades ago. The threat of gully formation associated with roads is less here than on Mt. Ashland. No new roads are proposed here.

Brush encroachment: At Mt. Ashland, the open areas occupied by the Mt. Ashland lupine and Henderson's horkelia are next to, or interspersed with, dense low patches of greenleaf manzanita (*Arctostaphylos patula*) and lesser amounts of gooseberry (*Ribes*), honeysuckle (*Lonicera*), and cherry (*Prunus*). On the western portions of the Henderson's horkelia population (west of the Rabbit Ears area) open areas are also bordered by montane sagebrush steppe dominated by mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Both the manzanita brushlands and sage steppe restrict and define the current habitat boundaries of the Mt. Ashland lupine and Henderson's horkelia populations. There is much more brush (where the Mt. Ashland lupine and Henderson's horkelia can't grow) than occupied Mt. Ashland lupine or Henderson's horkelia habitat. It is not known if the openings where the Mt. Ashland lupine and Henderson's horkelia

grow have changed in size over time as a result of fire exclusion or other factors. A careful examination of old aerial photos may help determine this. Most of the Henderson's horkelia occurrences in the Dutchman Peak/Jackson Gap/Observation Peak area are in non-brush areas but some of these subpopulations appear to use the edges of brush patches as microhabitat; perhaps for wind protection.

Brush encroachment may also be occurring at one or both Henderson's horkelia occurrences along the McDonald ridge. A careful examination of old aerial photos may help determine this.

Non-native species encroachment: Unlike many plant communities, no non-native species are currently threatening to dominate the population areas of the Mt. Ashland lupine or Henderson's horkelia. Though a few non-natives are present, they are either not expanding or are fairly ephemeral and trivial components of the plant communities. Colonial bentgrass (*Agrostis capillaris*), heavily seeded along the Mt. Ashland road up to the ski area parking lot, has not yet shown itself on the west side or summit of the mountain, and is not present on the Siskiyou Crest west of Mt. Ashland. Pubescent wheatgrass (*Agropyron trichophorum*) and perennial ryegrass (*Lolium perenne*), both seeded in the past on disturbed areas at the Mt. Ashland summit, parts of the current ski area, and scattered locations westward on the Siskiyou Crest, do not seem to be expanding in extent. A small patch of smooth brome (*Bromus inermis*) is present at Jackson Gap but hasn't yet expanded into Henderson's horkelia habitat.

Mountain Top Facilities: Currently, there is a National Weather Service building with a doppler radar unit, a ski lift terminal, a local television transmitter building and some unrelated telecommunications towers on the broad summit of Mt. Ashland. Initial construction of some of these facilities caused the loss of some Mt. Ashland lupine and Henderson's horkelia plants. Maintenance and improvements made to these facilities have occasionally caused the loss of some plants. Workers and their vehicles who service these facilities inadvertently contribute to the general disturbance at the summit.

There are occasional proposals for telecommunication facilities in the Dutchman Peak area. It is conceivable these could affect some Henderson's horkelia plants if constructed in certain locations. The Henderson's horkelia does not grow near the current active fire lookout and telecommunication towers on the summit of Dutchman Peak.

Grazing: Sheep and/or cattle grazing earlier in the 20th century may have influenced the current distribution and abundance of these two species to an unknown extent. Livestock can negatively impact plants through both direct grazing and trampling. No cattle grazing is permitted in the headwaters of the east fork of Grouse Creek, or in the Ashland Watershed, or on any part of Mt. Ashland. There are no proposals to permit grazing here in the future. Though cattle wander into these areas almost every summer (from allotments farther west), their presence is transitory and does not appear to alter the Mt. Ashland lupine or Henderson's horkelia habitat. Neither species are preferred forage plants for cattle, nor do they grow with preferred forage plants.

Other, western Henderson's horkelia occurrences are in active range allotments. The dry Henderson's horkelia habitat does not produce much forage and is not near water. Hence livestock use is currently light on most of these occurrences, and does not appear to affect most of them. However, one McDonald ridge occurrence and small parts of the Dutchman Peak/Jackson Gap/Observation Peak population are exposed to a level of livestock usage that may be detrimental to Henderson's horkelia plants. The Dry Lake area is used by livestock but the small bank where the Henderson's horkelia grows is only rarely affected.

All but one known population of Mt. Ashland lupine and Henderson's horkelia occur on ridges serving as boundaries between grazing allotments. These ridges are steep, dry and composed of moveable soils. Mt. Ashland lupine and Henderson's horkelia habitat is not suitable habitat for the growth of forage species, grasses and sedges, which cattle prefer. Cattle spend a majority of time in flatter areas of preferred forage or resting in shade.

Occasionally, cattle may travel through some population areas. The most likely area for cattle to be in the population would be at Dry Lake. This population has been monitored for use since 1995. Forage use in this area has been less than 15% every year. There are few preferred forage plants to attract cattle to the site. Cattle may walk through the population occasionally, but do not forage on or near the horkelia population.

Mt. Ashland lupine and Henderson's horkelia plants do not appear to be utilized much by wildlife.

Horseback riding is not a significant recreational use on the Siskiyou Crest. Pack animals are not commonly used here.

Utilization for commercial, sporting, scientific, or educational purposes: No such utilization of the Mt. Ashland lupine or Henderson's horkelia is known to occur.

Disease or predation: Most plants are susceptible to insect infestations, predation, and disease. Seed weevils (Family: Curculionidae) have been observed on the Mt. Ashland lupine and may cause a substantial reduction in viable seed produced. This pest is common among long-lived perennial plants and is normally not a limiting factor for legumes. These plants produce many times the seed needed for replacement, and much of the seed that escapes predation goes into the soil seed bank. Seeds may lay dormant for years before germination. Currently, there are no identified pests or pathogens that appear to be serious threats to either species. Pests and pathogens can always capitalize on stresses brought about by other environmental factors.

The adequacy of existing regulatory mechanisms: Neither taxa under this conservation agreement are Federally listed, and, therefore, do not receive full protection under the Federal ESA. Mt. Ashland lupine is a state listed Endangered Species, but the Oregon Endangered Species Act does not protect the species or its habitat, since it occurs entirely on Federal lands where the state has no management jurisdiction. U.S. Forest Service sensitive species status in

both Region 5 and 6 affords a substantial measure of protection by prohibiting actions that would lead to the Federal listing of these two species. U.S. Forest Service policies discourage or prohibit activities which would increase the need for Federal listing under the ESA.

Other natural or human-caused factors affecting their continued existence: None are currently known. Accidental introduction of some varieties of dwarf lupine into the Mt. Ashland lupine population area could cause hybridization and subsequent loss of genetic identity of the Mt. Ashland lupine.

VI. Conservation measures that will be implemented

The USFS agrees to manage the summit and open slopes of Mt. Ashland to protect existing populations of Mt. Ashland lupine and Henderson's horkelia. Population levels need to be maintained to ensure that loss of a few individuals to minor disturbances will have no effect on the future viability of both Mt. Ashland populations.

The USFS agrees to manage habitat for Henderson's horkelia in the Dutchman Peak/Jackson Gap/Observation Peak area in a manner that maintains the viability of this large complex of Henderson's horkelia patches and sub-populations. Sufficient population levels need to be maintained to ensure that loss of a few individuals to minor disturbances has no effect on the future viability of the Henderson's horkelia in this vicinity.

The USFS agrees to manage occupied Henderson's horkelia habitat along the McDonald ridge and at Dry Lake in a manner that is not detrimental to the Henderson's horkelia. Population levels in these small occurrences may decline or extirpation may occur due to random events or environmental factors beyond the control of the USFS.

To accomplish the above, and to meet the Management Goal stated earlier in this document, the following conservation actions will be taken:

ON MT. ASHLAND:

A. SUMMER RECREATION

1. Install barriers and routing devices that encourage vehicles to drive, park, and turn around in prescribed areas at Rabbit Ears and the summit.
2. Install interpretive signing about the rare plants, erodible soil and the consequences of recreational activities.
3. Continue to enforce the off-road vehicle closure (including off-road bicycles) and add additional signs to encourage compliance.

4. Institute year-round camping closure and day use party size limits at Rabbit Ears.
5. Study the feasibility and desirability of a late spring/early summer road closure, through the installation of a gate, during the period when vehicles can get partway, but not all the way, to the summit.
6. If monitoring (measure D-1) indicates continued decline after other measures are implemented, potential further actions are:
 - a. Trails to direct and confine foot traffic at the summit.
 - b. Longer term road closures, if visitor use is determined to be the cause of population declines.

B. WINTER ACTIVITIES

1. The extent of skier, snowboarder, and snow-grooming activity over Mt. Ashland lupine and Henderson's horkelia habitat would not be more than described under Alternative 2 of the February 2000 Draft Environmental Impact Statement for Mt. Ashland Ski Area Expansion. This includes the following mitigation measures or standard procedures described in that document that:
 - a. Establish a roped boundary along the west ridge, which would confine downhill skiers, snowboarders, and snow grooming to the ridge run north of the roped boundary;
 - b. Curtail activities when there is low snow depth;
 - c. Place snow fences in a manner that will not change the natural snow depth on any significant portion of the Mt. Ashland lupine and Henderson's horkelia population south of the roped boundary.
2. Except for grooming ski runs and emergency activity, snow machines operated by Mt. Ashland, Tucker, NOAA, KTVL, and others shall stay on the summit road or outside the Mt. Ashland lupine and Henderson's horkelia population areas.

C. HABITAT IMPROVEMENTS, RESTORATION, MAINTENANCE

1. Build no new roads in the population area and maintain the existing road in a manner that minimizes soil erosion and gully formation.
2. Stabilize any developing gullies before they start to affect Mt. Ashland lupine and Henderson's horkelia populations. If plant materials are used, use local stocks of native species.
3. Remove range livestock when they stray into the population area. Determine how

livestock gained access, and document and take preventative measures.

4. Conduct tests of prescribed burns in shrub patches next to, or within, Mt. Ashland lupine and Henderson's horkelia populations if monitoring determines a significant loss of habitat to brush encroachment. Continue prescribed burning if tests show it creates suitable habitat that is being colonized by Mt. Ashland lupine or Henderson's horkelia plants.
5. Control the spread of non-native species if they begin to encroach on the Mt. Ashland lupine and Henderson's horkelia population areas and are likely to affect habitat quality.

D. MONITORING

1. Continue using the Mt. Ashland lupine and Henderson's horkelia population monitoring protocol established by the Oregon Natural Heritage Program in 2001, with the following modification:

The first population monitoring interval will occur three years after the establishment of the baseline. Subsequent monitoring intervals will be every five years.

2. In addition to the Mt. Ashland lupine and Henderson's horkelia population monitoring, add the following to the monitoring program:
 - a. Brush encroachment monitoring, using aerial photos, starting with the oldest photos available;
 - b. Effectiveness monitoring in prescribed burn areas if brushfield burns are initiated
 - c. Photo-point monitoring at major disturbance sites;
 - d. Soil erosion and gully monitoring, especially in areas of high use. Implement restoration measures when gullies are discovered and field review deems it necessary;
 - e. Monitoring of population numbers, habitat changes and/or environmental variables in Mt. Ashland lupine and Henderson's horkelia population areas experiencing increased skiing/snowboarding/snow-grooming activity and new snow fencing.
3. Analyze, summarize, and publish the results of each protocol monitoring in the Forest's Monitoring Report or another available public document within one year of monitoring. Every five years, re-evaluate the effectiveness and appropriateness of the monitoring protocol. Change the protocol if data results, new information or new techniques show a need that outweighs the advantage of continuing an established protocol. The first year for this evaluation, and for publishing monitoring results was 2001.
4. Along with the FWS, institute annual Compliance Monitoring that consists of the following:
 - a. Review the implementation of management actions as agreed upon in this CA

- b. Monitor the effectiveness of management actions at reducing threats to the two species.
- c. Monitor the overall site and conditions of the species. If significant deterioration of population numbers or habitat condition are observed:
 - 1) Protocol monitoring must be implemented during the next flowering period; and
 - 2) The FWS and USFS will meet to discuss management needs to address any apparent species or habitat deterioration.

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E. SUMMER USE

1. Monitor the Dry Lake and Dutchman Peak Henderson's horkelia population areas, measuring utilization of grasses and sedges by livestock. Management objectives will be 30% or less use of these forage species within the Henderson's horkelia population areas. The method used should be ocular and clipped weight based on caged production measurements.
2. At Dry Lake, California, implement measures that would reduce the possibility of off-road vehicle damage to the Henderson's horkelia population. Keep road maintenance personnel and contractors informed of measures needed to avoid damage to the Dry lake Population.

F. DEVELOPMENT

1. During the NEPA process for all activities and developments proposed on USFS-managed lands on Dutchman Peak, the USFS will design projects to minimize the impacts to the Mt. Ashland lupine and Henderson's horkelia.

G. MONITORING

1. Monitor Henderson's horkelia populations as stated in the management goal and as described below:
 - a. Use sampling to detect trends in population levels of the larger subpopulations in the Dutchman Peak/Jackson Gap area.
 - b. Use GPS mapping (at the same intervals as the frequency sampling) of smaller sub-populations and isolated patches to track the presence/absence of these small groups.

- c. Monitor year-end forage utilization at all subpopulations in 2003 to determine if forage utilization is within the limits specified above. Beyond 2003, sampling intervals for forage utilization monitoring may decrease to every three years on those subpopulation areas where grazing levels were within specified limits in both 2003 and 2004. Identify subpopulation locations if they need to be monitored. Those monitored should be those most likely to be affected, i.e. Dry Lake and Dutchman Peak.
- d. Evaluate all proposed actions that could affect these Henderson's horkelia occurrences and mitigate when needed to maintain Henderson's horkelia population viability or avoid detrimental effects.
- e. Along with the FWS, institute annual Compliance Monitoring that consists of the following:
 - i. Review the implementation of management actions as agreed upon in this CA
 - ii. Monitor the effectiveness of management actions at reducing threats to the Henderson's horkelia.
 - iii. Monitor the overall site and conditions of the species.

H. COOPERATOR RESPONSIBILITIES

The FWS agrees to:

1. Provide technical assistance to the Rogue River and Klamath National Forests to assist in the implementation of this conservation agreement. Specifically, the FWS will:
 - a. Participate in each three or five-year monitoring review;
 - b. Help design the new monitoring elements described in the USFS section above.
2. Inform Rogue River and Klamath National Forests of new FWS activities that involve Mt. Ashland lupine and Henderson's horkelia or that affect this conservation agreement.
3. Forward information received from outside sources, about these species, to the USFS.
4. Reevaluate the status of Mt. Ashland lupine and Henderson's horkelia biennially or as needed and propose appropriate action or modifications if their status' change.
5. Cooperate in cost sharing of studies and similar actions specific to this conservation agreement, as allowed by funding.

VII. Funding and Implementation of Conservation Measures

At the time of the signing of this conservation agreement the Rogue River National Forest has already fully funded and nearly completed the NEPA process for implementation of the Summer Recreation projects and the gully stabilization portion of the Habitat Improvements, Restoration, Maintenance section listed above. The forest has already dedicated funds for a portion of the management actions and expects that approximately half of the parking barriers and routing devices will be installed during fiscal year 2003 with the remainder installed in 2004.

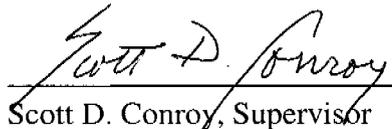
Monitoring efforts have occurred during numerous years in the past and are expected to continue to be funded in the future. The funding for these protection and monitoring activities is through National Forest Wildlife and Fish Funds which is substantial portion of the USFS's national funding for biological activities. These funds consistently fund rare plant work and the Rogue River National Forest gives plants with signed conservation agreements and conservation strategies top priority. A large majority of the funds required for the implementation of these conservation measures will come directly from the funding of staff positions which are expected to remain at or above current levels for both the USFS and the FWS. Both agencies are committed to seeking funding to implement this conservation agreement each year. Estimated costs for the implementation of the first decade of this conservation agreement are displayed in Appendix F.

The NEPA process is on-going for the Winter Activities portion described above as part of the proposed Mt. Ashland Ski Area Expansion. Potential threats resulting from the expansion would only occur in concert with the mitigation measures described and as part of the same proposed action.

VIII. Duration of the conservation agreement

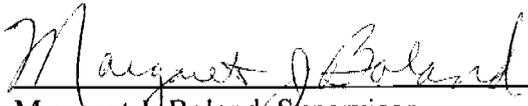
This conservation agreement shall become effective with the signature of the last approving agency official and shall remain in perpetuity. This conservation agreement can be terminated in writing at any time by the Rogue River National Forest, the Klamath National Forest, or the Oregon State Office of the FWS with a 30-day written notice to all three parties.

IX. Signatures



Scott D. Conroy, Supervisor
Rogue River and Siskiyou National Forests

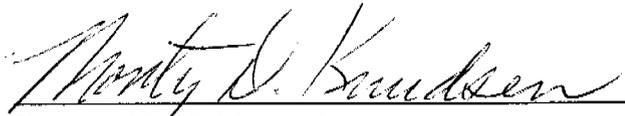
10/29/02
Date



Margaret J. Boland, Supervisor
Klamath National Forest

10/28/02
Date

Acting



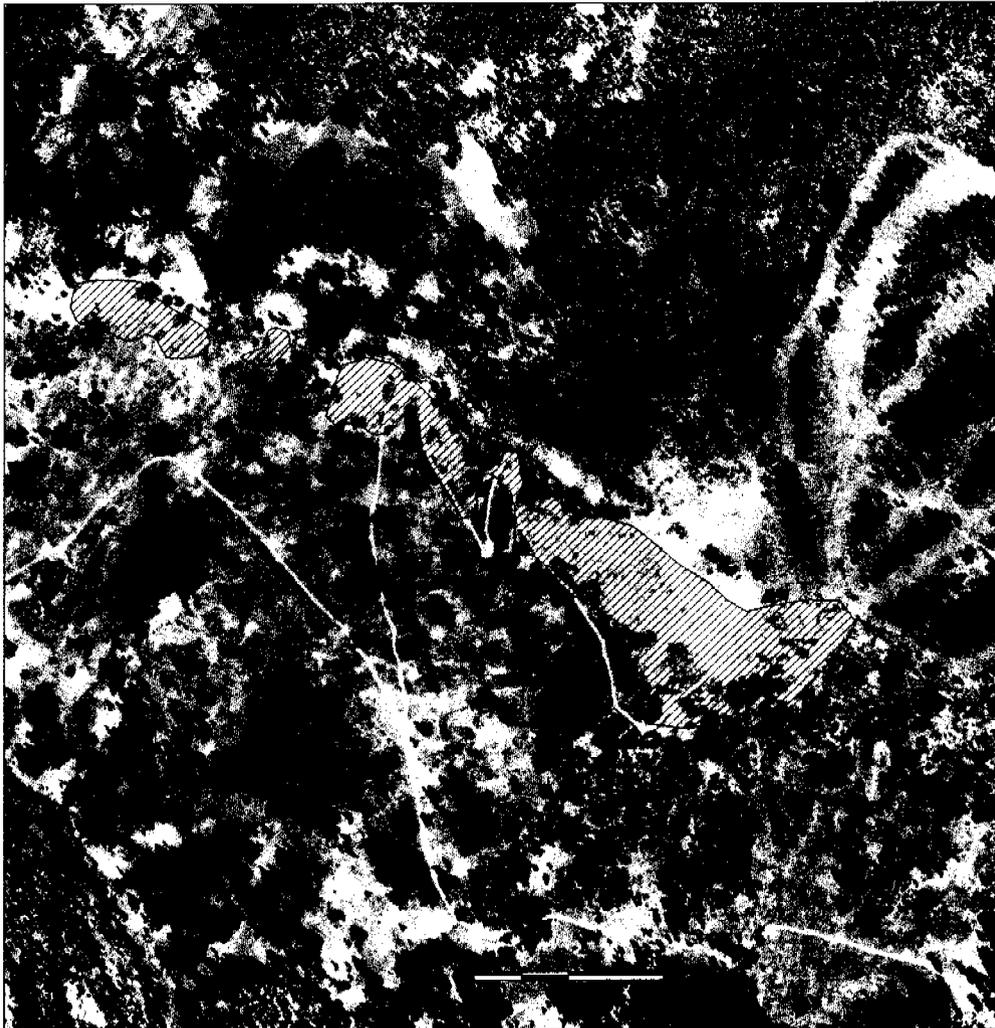
Kemper M. McMaster, Supervisor
FWS Oregon State Office

10/25/02
Date

Appendix A

MAP OF Lupinus lepidus var. ashlandensis ON MOUNT ASHLAND

drawn from a 1991 census effort



 Occupied habitat

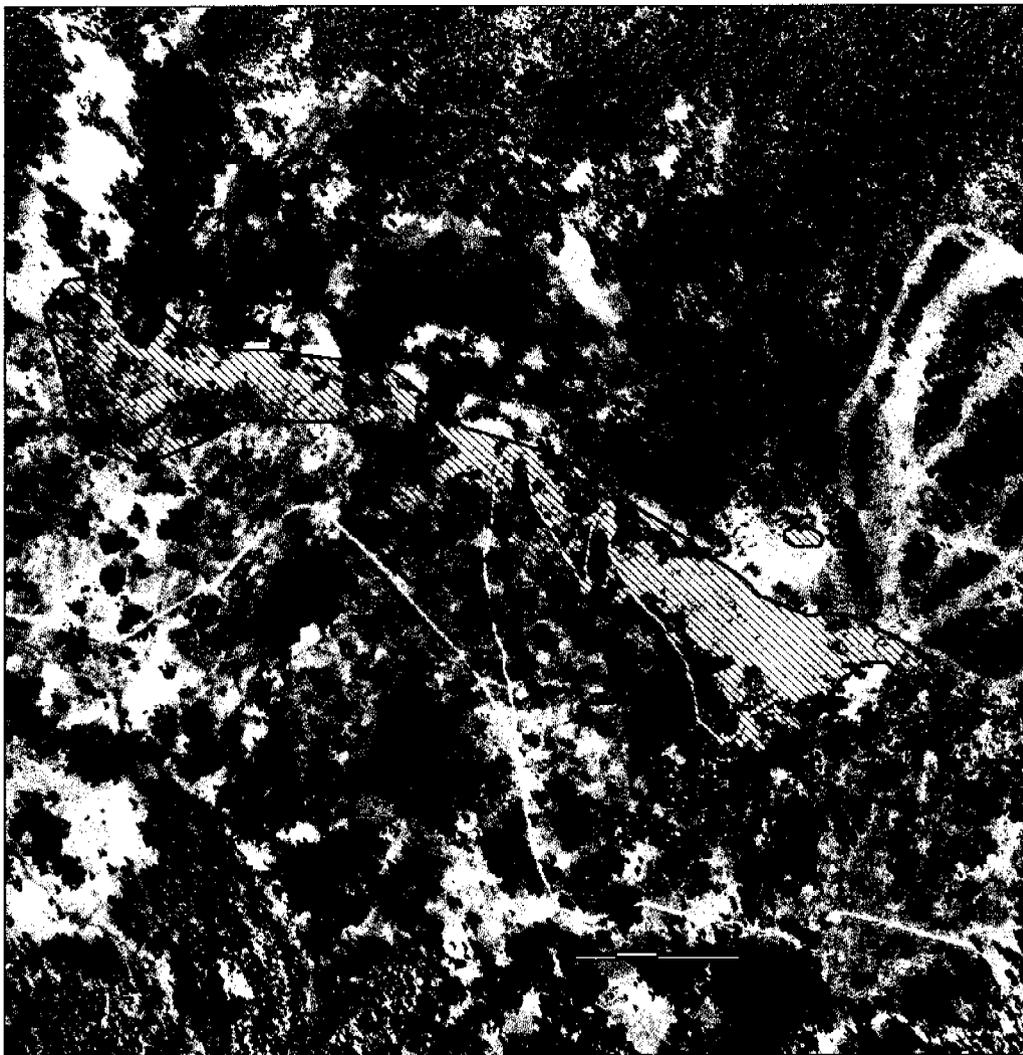


Appendix A

MAP OF THE MOUNT ASHLAND POPULATION OF

Horkelia hendersonii

**redrawn from the 1987 ONHP draft species management guide
(population boundaries are not precise)**



 Occupied habitat



Appendix A

MAP OF Horkelia hendersonii ALONG THE MCDONALD RIDGE

redrawn from the 1987 ONHP draft species management guide
(population boundaries are not precise)



 Occupied habitat



Appendix A

MAP OF Horkelia hendersonii IN THE VICINITY OF DUTCHMAN PEAK, JACKSON GAP, AND OBSERVATION PEAK

**redrawn from the 1987 ONHP draft species management guide
(population boundaries are not precise)**



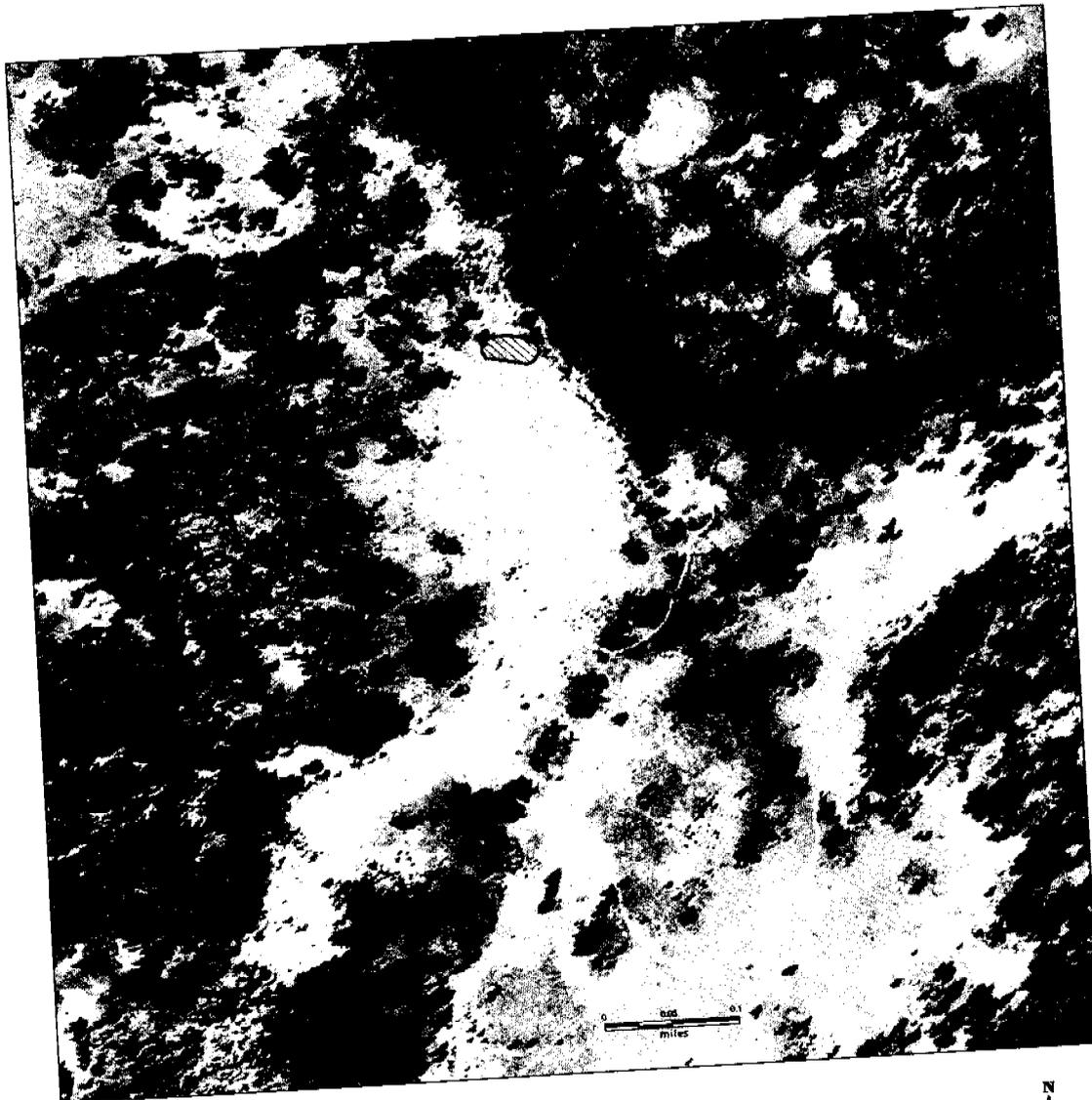
 Occupied habitat



Appendix A

MAP OF Horkelia hendersonii AT DRY LAKE

redrawn from the 1987 ONHP draft species management guide
(mapping may not be precise)



 Occupied habitat



Appendix B

Monitoring data for *Lupinus lepidus ashlandensis* not including seedlings

Plot Number	Location	1995	1996	1997
301	West Ridge	4	8	12
302	11	11	57	176
303	West Ridge	3	13	28
304	West Ridge	28	54	52
305	West Ridge	6	18	26
306	Rabbit ears	41	87	165
307	Rabbit ears	15	94	117
308	Rabbit ears	95	181	381
309	Rabbit ears	55	200	241
310	Rabbit ears	45	132	51
311	Lower slope	6	60	16
312	Lower slope	12	40	29
313	Lower slope	39	73	72
314	Lower slope	9	24	31
315	Lower slope	2	14	6
316	Upper slope	16	180	118
317	Upper slope	25	79	124
318	Upper slope	13	96	75
319	Upper slope	29	69	38
320	Upper slope	6	29	28
321	Summit	8	14	23
322	Summit	6	6	3
323	Summit	3	1	2
324	Summit	4	4	11
325	Summit	1	2	2
Totals		482	1535	1827
Mean		19.28	61.4	73.08
Variation		21.441119	57.991724	88.004963
Population estimate 95% CI		71,316 to 197,061	257,292 to 597,395	250,576 to 766,696

Appendix C

Description of Monitoring Design at Mount Ashland for *Lupinus lepidus* ssp *ashlandensis* and *Horkelia hendersonii*

Dan Salzer, The Nature Conservancy of Oregon
Jimmy Kagan, The Oregon Natural Heritage Program

Population areas

The population areas of *Lupinus lepidus* ssp *ashlandensis* (hereafter "Mt. Ashland lupine") and *Horkelia hendersonii* (hereafter "Henderson's horkelia") at Mount Ashland were divided into the following four management areas (see map prepared by Wayne Rolle): West Saddle (sagebrush), Rabbit Ears, Slope, Summit. There is small patch of habitat in-between Rabbit Ears and West Saddle that has been grouped with the West Saddle population. This patch will either be ignored or censused.

The size of each area was calculated by overlaying a grid of 204m² cells over a scaled map of Mt. Ashland lupine and Henderson's horkelia habitat prepared by Wayne Rolle. The total number of grid cells in each management area were summed to estimate the total area of each management area.

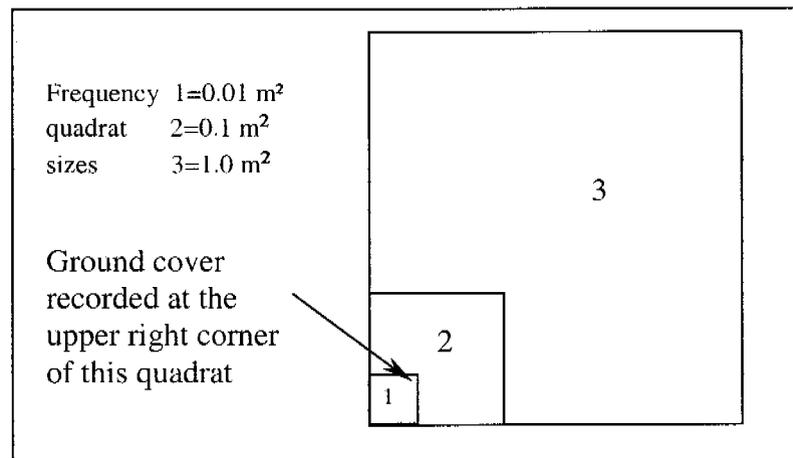
Sample size

We selected a sample size of 200 sampling units to be sampled in each management area. We believe the 200 sampling units will yield a minimum detectable population change of at least 15% for both the point-intercept cover and nested frequency sampling with 90% statistical power and a false-change (alpha) error rate of 0.10.

Sampling procedure

A combination of nested frequency and point-intercept sampling is being used to track changes in the populations of Mt. Ashland lupine and Henderson's horkelia and to measure an indicator of condition of their habitat. For the nested frequency sampling, the presence of any portion of a live Mt. Ashland lupine or Henderson's horkelia plant (i.e., leaf, stem, or inflorescence) constitutes presence within a quadrat.

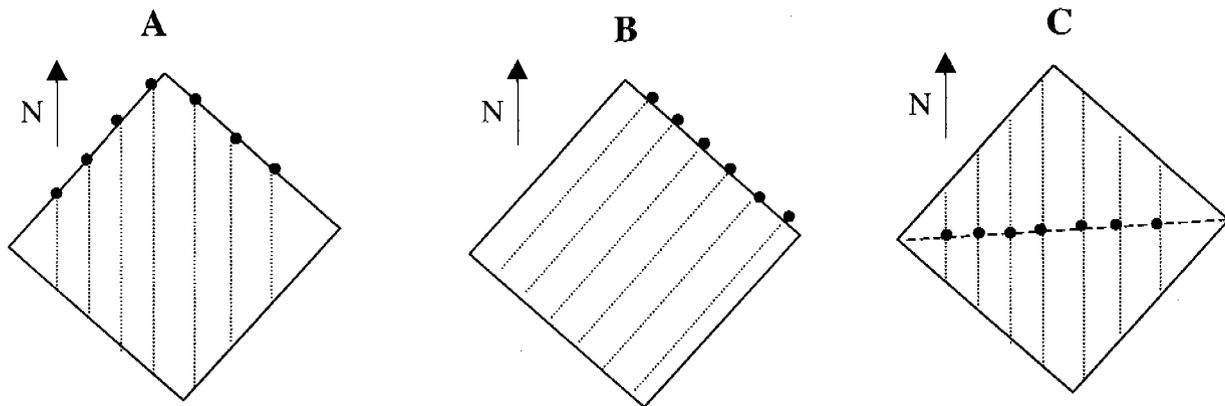
Presence is recorded within a set of nested square quadrat frames (see figure). Numerical codes of 1, 2, and 3 were assigned to each quadrat size as shown in the figure. With a nested quadrat design, the smaller quadrats are located within the corners of larger quadrats and so they are, by definition, included within larger quadrats. A species occurring in the smallest (0.01 m²) quadrat size receives a "1" on the field data form. A species occurring in the middle (0.1 m²) quadrat size but not in the smallest receives a "2". A species occurring within the largest quadrat size (1.0 m²) but not present in the smaller two sizes receives a "3". To summarize the frequency data for the smallest quadrat size, the number of quadrats with "1's" is divided by the total



Appendix C

random starting point selected between zero and one less than the quadrat spacing and the remaining quadrats positioned systematically at the selected quadrat spacing.

Transects were oriented in a true south direction to facilitate transfer of the resulting grid of transect and quadrat locations into GIS. This protocol is likely to complicate the siting of transects in some management areas. For example, consider a sampling area with a NE-SW orientation (see figures below). Using the management unit edge as a baseline (A) would require that two edges be used as part of the baseline to obtain transects that cover all areas in the management unit. Alternatively, transects could be run perpendicular to one edge of the management unit (B). A third alternative is creating a new baseline through the longest dimension of the management unit (C).



- Transect starting points

The use of any of these methods is sufficient to collect suitable data.

Sampling Times

Because any part of a plant is counted, it is important that sampling take place during a standard part of the field season each year. If sampling is done too early, some of the plants may be too young (small) to show up in a quadrat, while if sampling is done too late, plants may no longer be present. The initial sampling was done on July 9-11, 2001, which is as early in the season as is reasonable. Since the 2000-2001 winter was extremely dry, and the field season was extremely early, early July was suitable. Normal years, the best sampling times would be mid July through mid August.

Sampling Intervals

Based on previous work with Mt. Ashland lupine, it is unclear how stable plant numbers are from year to year. Therefore, it is recommended that at least two consecutive years of sampling take place, at least at the "Slope" site, which is the closest area to a control (i.e. it has limited impacts from people) at the site. Following this, sampling every five years should be sufficient.

Appendix D~2001/2002 Survey Data p.1

Mt. Ashland Plants Survey Data from 2001		Horkelia			
Plot Name	Number of Quadrats	1	2	3	
Summit	248	Single	23	28	57
		Nested	23	51	108
		Div. By 248	9.27	20.56	43.55
Rabbit Ears	211	Single	12	8	20
		Nested	12	20	40
		Div. By 211	5.69	9.48	18.96
Main Slope	210	Single	5	14	27
		Nested	5	19	46
		Div. By 210	2.38	9.05	21.90
2001 Totals~All Sectors		Horkelia			
		1	2	3	
		40	50	104	
	669	40	90	194	
		5.98	13.45	29.00	
				% of 210	

Appendix D~2001/2002 Survey Data p.2

Mt. Ashland Plants Survey Data from 2001					
Plot Name	Number of Quadrats	Lupine			
		1	2	3	
Summit	248	Single	8	19	48
		Nested	8	27	75
Div. By 248		3.23	10.89	30.24	
Rabbit Ears	211	Single	8	16	35
		Nested	8	24	59
Div. By 211		3.79	11.37	27.96	
Main Slope	210	Single	12	16	45
		Nested	12	28	73
Div. By 210		5.71	13.33	34.76	
2001Totals~All Sectors		Lupine			
		1	2	3	
		28	51	128	
		28	79	207	
		4.19	11.81	30.94	
		% of 210			
2001Totals~All Sectors		Horkelia			
		1	2	3	
		40	50	104	
		40	90	194	
		5.98	13.45	29.00	
		% of 210			
2001Totals~All Sectors		Lupine			
		1	2	3	
		28	51	128	
		28	79	207	
		4.19	11.81	30.94	
		% of 210			

Appendix D~2001/2002 Survey Data p.3

Plot Name	Number of Quadrats		Horkelia			
			1	2	3	4
Summit	222	Single	22	33	18	22
		Nested	22	55	73	95
		Div. By 222	9.91	24.77	32.88	42.79
Rabbit Ears	215	Single	11	11	31	14
		Nested	11	22	63	77
		Div. By 215	5.12	10.23	29.30	35.81
Main Slope	209	Single	12	22	38	15
		Nested	12	34	72	87
		Div. By 209	5.74	16.27	34.45	41.63
West Sage	205	Single	14	12	42	27
		Nested	14	26	68	95
		Div. by 205	6.83	12.68	33.17	46.34

Appendix D~2001/2002 Survey Data p.4

Plot Name	Number of Quadrats	Lupine				
		1	2	3	4	
Summit	222	Single	1	11	37	25
		Nested	1	12	49	74
		Div. By 222	0.45	5.41	22.07	33.33
Rabbit Ears	215	Single	7	14	40	18
		Nested	7	21	61	79
		Div. By 215	3.26	9.77	28.37	36.74
Main Slope	209	Single	12	21	67	33
		Nested	12	33	100	133
		Div. By 209	5.74	15.79	47.85	63.64
West Sage	205	Single	0	10	16	11
		Nested	0	10	26	27
		Div. by 205	0.00	4.88	12.68	13.17

Appendix D~2001/2002 Survey Data p.5

Mt. Ashland Plants Survey Data from 2002

2002 Totals~All Sectors	Horkelia			
	1	2	3	4
Total Quadrats				
851	59	78	129	78
	59	137	266	344
	6.93	16.10	31.26	40.42
	% of 851			
Without West Sage				
646	45	66	87	51
	45	111	198	249
	6.97	17.18	30.65	38.54
	% of 851			

Appendix D~2001/2002 Survey Data p.6

		Lupine			
		1	2	3	4
2002 Totals~All Sectors					
Total Quadrats	851	20	56	160	87
		20	76	236	323
	% of 851	2.35	8.93	27.73	37.96
Without West Sage					
	646	20	46	144	76
		20	66	210	286
	% of 851	3.10	10.22	32.51	44.27

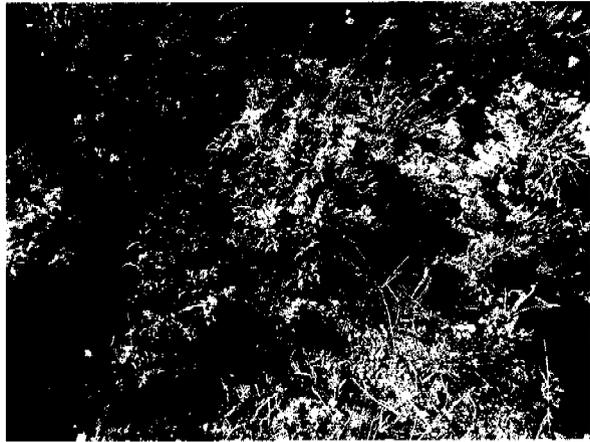
Appendix D~2001/2002 Survey Data p.7

2002 Totals~All Sectors	Horkelia				Lupine			
	1	2	3	4	1	2	3	4
Total Quadrats 851	Single 59	78	129	78	Single 20	56	160	87
	Nested 59	137	266	344	Nested 20	76	236	323
	% of 851 6.93	16.10	31.26	40.42	% of 851 2.35	8.93	27.73	37.96
Without West Sage 646	Single 45	66	87	51	Single 20	46	144	76
	Nested 45	111	198	249	Nested 20	66	210	286
	% of 851 6.97	17.18	30.65	38.54	% of 851 3.10	10.22	32.51	44.27
Combined 2001/2002 Baseline Total Quad. 1315	1	2	3		1	2	3	
	85	201	392		48	145	417	
	% of 1315 6.46	15.29	29.81		3.65	11.03	31.71	

Appendix E

Photos of the Mt. Ashland lupine and the Henderson's horkelia

Mt. Ashland lupine



Henderson's horkelia

Appendix F

10-year Cost and Implementation Schedule for Mt. Ashland Plant Conservation Agreement

Task #	Task Description	Agency	Total Cost	cost estimates are in thousands of dollars									
				2002 ^a	2003	2004	2005	2006	2007	2008	2009	2010	2011
Mt. Ashland Populations													
Summer Activities													
	NEPA Process	USFS	3.5	1.5	1								
A1	Vehicle Barrier Placement	USFS	8		5	3							
A2	Interpretive Signing	USFS	3		1	2							
A3	ORV Closure/signs	USFS	#		#	#							
A4	Rabbit Ears Camping Closure	USFS	1			1							
A5	Road Closure Study	USFS	1		1								
A6	Conditional Trails/Closures		4				2					2	
Winter Activities													
	NEPA Process	USFS	4	2	2								
B1a	Establish Roped Boundary	USFS	5		1		1		1		1	1	
B1b	Curtail Skiing During Low Snow	USFS	x		x	x	x	x	x	x	x	x	
B1c	Snow Fence Placement	USFS	5		1		2		2		2		
B2	Snow Machine Restrictions	USFS	3		1		1		1		1		

Appendix F

Task #	Task Description	Agency	Total Cost	cost estimates are in thousands of dollars									
				2002 ^a	2003	2004	2005	2006	2007	2008	2009	2010	2011
Habitat Improvements, Restoration, Maintenance													
	NEPA Process	USFS	2.5	1.5	1								
C1	Maintain Roads/Avoid Gullies	USFS	6		2				2			2	
C2	Gully Stabilization	USFS	6		4	2							
C3	Remove Livestock	USFS	x			x				x		x	
C3	Determine Livestock Access	USFS	x			x				x		x	
C4	Conditional Burning	USFS	6								3	3	
C5	Control Non-native Species	USFS	2									2	
Monitoring													
D1	Continue Monitoring Protocol	USFS	9.5	2	2				2.5			3	
D2a	Brush Encroachment Monitoring	USFS	2			1						1	
D2b	Conditional Burn Area Monitoring	USFS	1									1	
D2c	Photo-point Monitoring	USFS	x		x				x			x	
D2d	Gully Monitoring	USFS	5		1					1		1	
D2e	Snow-use related Monitoring	USFS	4				1			1		1	
D3	Analyze and Publish Monitoring Results	USFS	1									1	

Appendix F

Task #	Task Description	Agency	cost estimates are in thousands of dollars											
			Total Cost	2002*	2003	2004	2005	2006	2007	2008	2009	2010	2011	
D4a,b&c	Project Effectiveness Review/ Site Condition Monitoring	USFS FW/S	5 10	1	1	1	1	1	1	1	1	1	1	1
McDonald Ridge, Dry Lake and Dutchman Peak Complex and Horkelia Populations														
Summer Use														
E1	Dutchman Peak/Dry Lake Forage Utilization Monitoring	USFS	5		1		1		1		1		1	1
E2	Reduce Potential ORV Damage At Dry Lake	USFS	3				1				2			
E2	Road Maintenance Personnel Training	USFS	x											
Development														
F1	Dutchman Peak Project NEPA Participation ^r	USFS	1				1		1		1		1	1
Monitoring														
G1a	Sampling of Dutchman Peak/Jackson Gap Populations	USFS	6			2		2					2	
G1b	GPS Mapping of Isolated Patches and Subpopulations	USFS	2					2						
G1c	Monitor Year-end Forage Utilization	USFS	x		x		x		x		x		x	x
G1d	Proposed Action Evaluation	USFS	x											

Appendix F

Task #	Task Description	Agency	Total Cost	cost estimates are in thousands of dollars								
				2002 ^a	2003	2004	2005	2006	2007	2008	2009	2010
G1e1,i,iii	Annual Review of Management Actions and Monitoring	USFS FWS	4 10	1	1	1	1	1	1	1	1	1
Cooperator Responsibilities												
H1a	Participate in Protocol Monitoring Efforts	FWS	17	3.5	4		4.5					5
H1b	Assist in Designing New Monitoring Elements	FWS	6		2		2					2
H2	Inform USFS of FWS Activities Affecting These Species	FWS	x									
H3	Sharing Information from Outside Sources	FWS	x		x		x		x		x	x
H4	Biennial Status Reevaluation	FWS	7.2				1.8		1.8		1.8	1.8
H5	Cost Sharing ^f	FWS	15-21		5-7		5-7				5-7	

p-all or portions of these actions have already been carried out
#-funding for this activity is included in previous conservation action funding
underlined figures are contingent on discovering negative impacts at a later date
x-negligible amounts; generally consisting of phone conversations or activities as part of other work lasting less than one day
n-no projects are planned in this area for the foreseeable future
f-dependent on funding