Calochortus coxii Habitat Restoration
Environmental Assessment
South River Field Office
EA# OR 105-99-09

Chapter 1
PURPOSE AND NEED FOR ACTION

Crinite mariposa lily (*Calochortus coxii*), is a newly discovered and described species (Godfrey & Callahan 1988) only known to occur on a ten-mile system of serpentine ridges located between the communities of Myrtle Creek and Riddle in southern Douglas County, Oregon. The Crinite mariposa lily is listed as a Bureau of Land Management (BLM) Bureau Sensitive Species. The Oregon Department of Agriculture has listed this species as Endangered (1995) and has completed a status survey report as part of its Section 6, Endangered Species Act (ESA) agreement with the U.S. Fish and Wildlife Service (USFWS).

The Crinite mariposa lily is found only within the boundaries of the portion of the Roseburg District administered by the South River Field Office. The most prolific occurrences of *Calochortus coxii* (*C. Coxii)* are generally found on northerly aspects, in open woodland, along forest margins, and in grasslands. The BLM manages 435 acres identified as potentially suitable *C. coxii* habitat. Fire suppression in the last 80 years has dramatically altered much of this open conifer forest habitat. In 1998, a conservation strategy was prepared for the purpose of identifying and scheduling management actions that would remove or limit threats to *C. coxii* from habitat loss, and provide for long term survival of the species. The objective of the management actions proposed in the conservation strategy is to remove the need to list the plant as threatened or endangered. This would be accomplished by maintaining or increasing the numbers of *C. coxii* through maintenance and restoration of habitat in each of the sub-population sites. Continued work on a conservation strategy for *C. Coxii* is recommended in the Cow Creek Watershed Analysis, September 5, 1997 (p. xii).

The South River Field Office of the Roseburg District BLM proposes habitat restoration and habitat maintenance treatments in the Cow Creek and Myrtle Creek Watersheds. The areas are covered by the Cow Creek and Myrtle Creek Watershed Analyses. The purpose of the project is to implement management actions identified and proposed in the Crinite Mariposa Lily *(C. coxii)* Conservation Strategy (1998).

The areas proposed for treatment are within the Matrix land use allocation. Matrix land are described in the April 13, 1994, Standards and Guidelines (S & G) for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl and Record of Decision (ROD).

The purpose of this Environmental Assessment (EA) is to complete analysis of the potential environmental impacts and consequences which could result with the site specific implementation of the conservation strategy. The analysis assists in the determination of the "significance" of the impacts. This proposal is intended as a multi-year project. Habitat treatments would occur over a ten year period

after which the conservation strategy would be reevaluated. Monitoring would be conducted in accordance with the conservation strategy to determine plant response and treatment success. Some areas may require multiple treatments to restore and maintain the desired habitat conditions.

I. **Decisions To Be Made**

What site specific project design features and Best Management Practices (BMP) would be necessary to meet the requirements of the Roseburg District Record of Decision and Resource Management Plan (ROD/RMP), the objectives of the Crinite Mariposa Lily *(C. coxii)* Conservation Strategy (1998), and the Director's overall objective of maintaining "Healthy Ecosystems"?

II. **Permits, Licenses, Laws, Requirements, Policies, & Other Related Considerations**

1. The proposed project area is not within the Coastal Zone Management Area.

2. None of the areas proposed for treatment are within 1/4 mile of any lands zoned R-5 and subject to Rural Interface objectives.

III. **Concerns/Issues**

The Interdisciplinary Team (ID Team) brought forward concerns related to resources that had the potential of being affected by the proposed actions. Concerns were mitigated through the implementation of project design features and the application of BMP listed in the Roseburg District ROD/RMP (Appendix D), so that none of the concerns were elevated to issues. The Critical Elements of the Human Environment were considered and are summarized in Appendix A.

Chapter 2
DISCUSSION OF ALTERNATIVES

I. Alternative 1 - Proposed

A. Background and Objectives

The proposed action would implement management of *C. coxii* habitat. The objective would be to maintain or increase the numbers of *C. coxii* by maintaining and restoring habitat for each of the sub-populations. Treatments of prescribed burning, tree girdling and/or thinning of pre-commercial sized trees would be applied on scattered small areas (units) of 0.1 to 5 acres in size totaling up to 30 acres per year. Timber harvest is not proposed as a treatment, and none would occur as a consequence of the proposed treatments. There would be no entries into Riparian Reserves associated with the proposal. All treatments would be restricted to lands classified in the Timber Production Capability Classification (TPCC) as FNNW (fragile nutrients nonsuitable woodland) and NF (non forest). The

proposed areas are not in the timber base and are not managed for timber production. Over the course of the proposed ten-year habitat management plan, the percentage of BLM-managed habitat that would be treated for any single sub-population, as identified in the conservation strategy, would not exceed 30%. Table 1 shows acres of total potential suitable habitat by sub-population and the maximum number of acres that would be treated in 10 years, under this proposal.

The Conservation Strategy for *C. coxii* (1998) includes the following proposed management action: "Prescribe burn habitat on public land on a frequency of approximately every 10-20 years and precommercial thin or girdle trees to produce gaps in [the] forest habitat and maintain habitat." The treatments proposed by this alternative would be applied on portions of the Bilger Ridge, and Smith sub-populations within the Myrtle Creek-Bilger Ridge population, and on the Langell Ridge sub-population within the Boomer Hill-Langell Ridge population. These sites were selected because they provide the best opportunity to restore and maintain habitat for each of the populations described in the Conservation Strategy.

Table 1

Proposed Management Treatment Summary

Population/Sub-population	Total Acres	Maximum Proposed Treatment Acres	Maximum Proposed Treatments	Proposed Treatments
Myrtle Creek-Bilger Ridge				
Bilger Ridge	60		18	Thin/Girdle/Burn
Smith	166		50	Thin/Girdle/Burn
Boomer Hill-Langell Ridge				
Myrtle Creek Beacon	24		0	None
Boomer Hill	29		0	None
Red Ridge	23		0	None
Langell Ridge	133		40	Thin/Girdle/Burn
Totals	435		108	

Photo 1 Open habitat with Incense-cedar and Jeffrey pine seedlings starting to establish. Typical of areas where broadcast underburning would be prescribed.

C. coxii occurs in both meadow and forest habitat in a somewhat patchy distribution throughout the proposed project area. Monitoring and research has shown that it favors more open habitat as opposed to dense forest. However, optimal habitat appears to involve some partial shade or protection.

Photo 1 represents an example of the open woodland/ grassland habitat typical of the largest occurrences of *C. coxii*. The goal of the proposed treatments is to enhance *C. coxii* habitat so it would resemble the habitat shown in Photo 1. Density plots have indicated favorable timber habitat to consist of a stand density of 40-55 trees per acre (diameter class 14"-28") with a crown closure of 20-30 percent. The grass openings are largely a mix of bunchgrasses dominated by Idaho Fescue (*Festuca idahoensis*), California oatgrass (*Danthonia californica)*, and Western rye-grass (*Elymus glaucus*).

Natural disturbances by frequent light surface fires would have historically maintained much of the area in a more open habitat such as shown in Photo 1.

The exclusion of wildfire over the past 60-80 years has resulted in increased canopy closure over much of the habitat. The remaining open grassland, transition areas between forest and grassland, and Jeffrey pine savanna plant communities are continuing to decline as a result of the continued exclusion of wildfires.

B. Proposed Treatments

1. Prescribed Fire, Broadcast Underburning

In order to prevent further loss of the habitat of *C. coxii*, prescribed fire would be applied to maintain existing open forest habitat. Broadcast underburn treatments would be accomplished on relatively small areas (0.1 - 10 acre units) within the three sub-populations identified for treatment in Table 1. Underburning would be prescribed where the establishment and encroachment of tree seedlings threatens the openness of the site (as in the foreground of Photo 2). Because *C. coxii* grows and flowers from late spring to early summer, fire would not be applied until mid to late summer. The above-ground portion of the lily quickly dies back after flowering. Surface fuels consist mainly of cured grasses, pine needle litter, mosses, and duff. These surface fuels would be burned in mid to late summer, the same time of year during which natural wildfires would be likely to occur. Prescribed fire plans would be prepared for each specific area (unit) identified for burning. Site specific resource objectives

Photo 2 Jeffrey pine and Incense-cedar seedlings starting to occupy foreground opening, background understory already established.

would be identified and used to develop the burn prescription, and would include a range of environmental conditions within which the objectives could be met. All burning would be done in accordance with the Oregon Smoke Management Plan.

Because forest fuels are dry during the season when the prescribed underburns would occur, individual burn units would be kept small (.1-10 acres). Prescribed burning would only be applied where fuels, weather, topography, and road access would allow the logistical support needed for public and firefighter safety, and control of the fire behavior. Because these units would be burned during fire season immediate mop-up of all burned areas would be required, and all smoldering fuels would be extinguished. This would be accomplished by pre-positioning hose lays around the units prior to ignition, establishing a wet-line for fire control lines, and using the hose lays to begin mop-up immediately after burning.

Ladder fuels provide vertical continuity between surface fuels and crown fuels in a forest stand, contributing to an increased risk of torching and crownfire. Prescribed fire application would be excluded from areas possessing substantial ladder fuels to reduce the risk that timber canopy would be burned. Under dry summer conditions a slow ignition sequence would be used, constrained by burn prescription limits on maximum allowable wind, temperature, and predicted fire behavior. These constraints, included in the burn plan, would further reduce the potential risk of having a prescribed fire escape control and become a wildfire.

The "Maximum Proposed Treatment Acres" identified for each sub-population in Table 1, represents the sum of acres treated by thinning, girdling, and prescribed fire. During the initial 1-2 years of this proposal approximately 5 to 10 acres/year would be treated with prescribed underburning. Up to 30 acres/year could eventually receive a prescribed underburn treatment because areas treated with thinning and/or girdling may require periodic underburning to maintain the desired habitat.

2. Thinning, Girdling, Pile and Burn

As illustrated in Photo 3, the dense understory of Incense-cedar has resulted in complete canopy closure. Inventory plots have tree densities as high as 1,200 stems per acre. This over-stocking and canopy closure results in a loss of *C. coxii* habitat. In areas with such high densities, girdling and/or thinning would be done to obtain the desired density of 40-55 trees per acre to restore optimal habitat conditions.

Girdling and/or thinning would be used where stem density, ladder fuels, and/or the degree of canopy closure would preclude the application of a prescribed underburn.

Thinning would consist of cutting and removing small diameter trees with a diameter at breast height (DBH) of less than 6 inches. It may be necessary to pile and cover this material away from units for burning in the fall and winter months.

Girdling would consist of making parallel cuts into the cambium layer around trees with greater than 6 inches DBH. The girdled trees would remain standing. This treatment would create gaps throughout a stand. Individual treatment units would range in size from one-tenth of an acre to five acres.

Habitat conditions vary throughout the range of *C. coxii* and within individual stands. Within a typical treatment unit of five acres, portions would require a thinning/girdling treatment, while other portions would be underburned. Some portions of units would require no treatment. Over the 10-year life of the project, any given unit could receive multiple, successive treatments. The series of photos contained in this EA show the habitat transition from open to closed canopy structure that has resulted from fire exclusion. Results of monitoring as set forth in the Conservation Strategy would determine if subsequent treatments are necessary.

Photo 3
Dense understory of small diameter Incense-cedar.

Photo 4
Forest Margin, transition between opening and forest occupied by well established Incense-cedar and Jeffrey pine saplings.

II. **Alternative 2 - No Action**

Manipulation of current vegetative conditions and communities would not occur under the "No Action" alternative. Normal ecological and successional processes that developed in response to regular fire occurrence would not proceed, leading to loss of habitat for *Calochortus coxii*. Current population data and observations suggest that the amount of meadow habitat is decreasing and being replaced by forest habitat. Much of the forest habitat is currently in an early-seral stage dominated by dense stands of young trees and tree seedlings that are encroaching on more open meadow habitat. The amount of meadow habitat would continue to decrease if current conditions of ecological succession remained unchecked. Loss of meadow would decrease the amount of suitable habitat for *C. coxii*. This ecological succession is recognized in the Conservation Strategy as one of the primary threats to the viability of *C. coxii*.

Chapter 3
AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES AND RECOMMENDED MITIGATION

I. **Alternative 1 - Proposed**

A. Vegetation/Timber

Fire suppression has resulted in the loss of some open grassland and open forest/grassland habitat that would exist under a natural fire regime. Transition of the grasslands to forest has occurred slowly on this site. This is likely the result of the highly toxic nature of serpentine soils, high summer temperatures, and low soil moisture/water holding capacity of the serpentine soils. These factors form the basis for classification of the sites as non-suitable woodlands and non-forest in TPCC. Non-forested areas and remaining openings likely exist because of these harsh environmental conditions and the continued

occurrence of small fires. Fire suppression efforts have dramatically reduced the area impacted by fire but have not completely eliminated fire as a disturbance on the sites.

The majority of forest stands within the proposed project area consists of a mixture of Jeffrey pine and Incense-cedar with the oldest trees approximately 100 years of age. Meadows are intermingled in the project areas consisting largely of a mix of bunchgrasses dominated by Idaho Fescue, California oatgrass, and Western rye-grass. Small seedlings and saplings have also established themselves in the openings. Portions of the project areas have concentrations of smaller Incense-cedar growing in the understory. Isolated pockets within the project areas have tree densities as high as 1,200 stems per acre, comprised primarily of Incense-cedar.

C. coxii is a bulbous perennial herb that is endemic to serpentine-derived soils. *C. coxii* most commonly occurs in open Jeffrey pine and Incense-cedar woodlands and grasslands, at elevations between from 1,300 feet and 2,700 feet above sea level. Monitoring and research have shown that it favors more open habitat as opposed to dense forest. Biological information of *C. coxii* is described in the Conservation Strategy (1998).

There is one other special status plant species within the proposed project area. *Allium bolanderi* var. *mirabile* is a Bureau tracking species that also grows in open woodlands.

The EA file contains a list of the Survey and Manage and Protection Buffer botanical species suspected to occur in the project area. Field surveys would be conducted according to established protocols for those species suspected in the area prior to any activities that could affect habitat. Known sites would be managed in accordance with applicable management recommendations.

The thinning and girdling treatments would decrease canopy cover and provide a more open habitat that would be conducive to *C. coxii*. A potential direct short-term impact of thinning would be an increase in surface fuels on the specific treatment areas. Slash created by thinning treatments would be hand-piled and burned during the wet season, or scattered across the site.
Girdling treatments would result in an increased number of standing of snags. Increased numbers of snags per acre would have a potential favorable impact to wildlife by providing an increase in potential habitat for cavity nesters. The number of trees that would be girdled in any area would not be large enough to create conditions favorable to insect infestations.

The reintroduction of fire through prescribed burning would the beneficial effect of maintaining meadow habitat by removing small seedlings and excess litter, providing a more favorable environment for seed germination and growth of herbaceous plants, including *C. Coxii*. A late summer burn would not damage *C. coxii* because the plant is in a state of dormancy at this time of the year. Jeffrey pine is adapted to withstand low-severity fires in well spaced stands. In the areas treated to maintain the open grassland/Jeffrey pine forest, the mature Jeffrey pines would survive most fires, suffering only bole scorch. An indirect adverse impact would be that Jeffrey pine and Incense-cedar seedlings would continue seeding in on the burned areas and may have an increased rate of survival due to the exposed soil that would result from burning. Some areas would require periodic treatment with light surface fire

to maintain the habitat.
Based on past research and monitoring (Fredricks 1989, BLM 1995, 1996, 1998), *C. coxii* would be expected to respond favorably to this treatment with increases in reproductive success and increases in population density. If the unexpected occurs and there is a negative effect on the species or its habitat, population viability would not be threatened because of the limited scope of the treatments. *Allium bolanderi* var. *mirabile* would also be expected to respond favorably to the treatments, having been observed growing on exposed sites. Over the course of the proposed ten-year habitat management plan, the percentage of BLM-managed habitat that would be treated for any single sub-population, as identified in the conservation strategy, would not exceed 30%.

B. Soils

Calochortus coxii is endemic to serpentine-derived soils. The majority of *Calocortus coxii* sites occur on ultramaphic bands which extend northeasterly through the central part of Douglas County and are primarily composed of a combination of two soil types, Pearsoll and Dubakella. The proposed habitat restoration areas also contain soils similar to Pearsoll and Dubakella but with loamy textures and a clay content of less than 35 percent.

Soils in the proposed project areas fall into two categories as relates to their sensitivity to the application of prescribed fire. The areas contain both Category 1 and Category 2 soils. Category 1 soils are identified as highly sensitive to broadcast burning, and possess one or more of the following characteristics: 1) Soils are shallow, generally less than 20 inches deep to hard bedrock; 2) Soils have less than 4 inches of dark surface A horizon; and 3) Slopes are generally greater than 70 percent. Category 2 soils are identified as moderately sensitive to broadcast burning with slopes generally less than 65 percent and soil depths in excess of 20 inches to hard bedrock.

Thinning and girdling would not be expected to have any impacts on soils. Prescribed burning would occur where fuel loads are light, and surface fuels are fine and flashy consisting primarily of grasses. Areas with heavy fuel loading or large fuels would not be burned. Only a small percentage of any sub-population habitat would be burned in any given year. As a consequence, burn durations should be no longer than one or two minutes and of low intensities. Under such conditions only minor exposure of mineral soil would be expected to occur, and the impacts on soils would be minimal.

C. Special Status Species

Federally Threatened or Endangered
The proposed project area is not located within the range of the Columbia white-tailed deer or the marbled murrelet constituting a "No Affect" determination for these species. It has been determined that the action constitutes a "No Affect" for the bald eagle and peregrine falcon because suitable habitat is lacking.

Federally Threatened Northern Spotted Owl

The proposed project area is outside the home range of any known sites for the northern spotted owl. Suitable habitat for the northern spotted owl exists within the overall project boundaries but specific project areas are outside of "suitable habitat" and the proposed project is considered a "No Affect" action.

Federally Threatened or Endangered Fish Species

The project area lies within the range of the Federally endangered Umpqua River cutthroat trout and the Federally threatened Oregon Coast coho salmon. There would be no treatment of habitat within Riparian Reserves, so there would be no impacts to aquatic habitat and fisheries resources. Upland disturbances associated with the proposed treatments would be minimal based on the limited size of areas to be treated in any given year and the dispersal of areas to be treated along ridge top locations. The proposed project is considered to be a "No Affect" for both the Umpqua River cutthroat trout and the Oregon Coast coho salmon.

Survey and Manage Species

Mollusk species have been identified in proximity to areas identified for treatments under this proposed project. Key habitat features are not expected to be affected by the action. Broadcast burning would be applied at a time of year when the mollusks are dormant and below ground. Areas containing concentrations of large woody debris would be excluded from prescribed underburning.

Surveys for the red tree vole are not required based on the guidance of Instruction Memorandum No. OR-97-009. In the Myrtle Creek Watershed, the BLM administers 41% of lands in the watershed. In the Cow Creek Watershed, the BLM administers 36% of lands in the watershed. Since Federal administration exceeds 10% of the land base in both instances, *Screen 2 - Habitat Condition Threshold* applies. In the Myrtle Creek Watershed, approximately 17,296 acres of the 31,009 acres of the forest stands administered by the BLM are 80 years of age or older. This acreage constitutes nearly 56% of the BLM-administered lands in the Myrtle Creek Watershed. In the Cow Creek Watershed, approximately 26,774 acres of the 42,450 acres of the forest stands administered by the BLM are 80 years of age or older, constituting 64% of the BLM-administered lands in the Cow Creek Watershed. Forested stands of these ages would be expected to meet the habitat criteria described in the memorandum as a minimum of 60% crown closure and 10 inches in diameter at breast height (DBH). The percentage of suitable habitat in both watersheds exceeds the 40% threshold criteria for requiring on the ground surveys. Surveys were not required by the interim guidance for surveying and managing for the red tree vole. Stands 50 to 80 years in age would probably also meet these criteria, increasing the percentages of suitable habitat, further.

Potential suitable habitat for other Survey and Manage species which may occur in the project areas will be evaluated. If suitable habitat is identified surveys will be conducted in accordance with established protocols. If any Survey and Manage species are identified on the project areas they will be managed in accordance with management recommendations.

D. Cultural Resources

No known cultural resources exist in the project area.

E. Air Quality

Impacts to air quality associated with the application of prescribed fire treatments would be minimal. All burning would be done in accordance with regulations found in the Oregon Smoke Management Plan. Broadcast burning would generate few particulates by the nature of the fine, flashy surface fuels to be treated, the small areas to be treated, and the short duration of burn prior to full mop-up. Burning hand-piles during the fall or winter would have short term impacts to air quality limited to a few hours and within the immediate vicinity of the areas burned. Burning during rainy periods would have the affect of dispersing smoke, washing particulates from the air, and extinguishing the piles.

F. Water Quality/Hydrology

There would be no prescribed fire applied within Riparian Reserves. Consequently, it is not expected that there would be any impacts to water quality or aquatic structures based on the small scale of treatments in upland areas. Burning would not be expected to expose large areas of mineral soil that would erode and wash sediments into the aquatic system.

Limited thinning in the understory, and limited girdling would not have a measurable effect on water routing to the aquatic systems.

II. **Alternative 2 - No Action**

Manipulation of current vegetative conditions and communities would not occur under the "No Action" alternative. Normal ecological and successional processes that developed in response to regular fire occurrence would not proceed, leading to loss of habitat for *Calochortus coxii*. Current population data and observations suggest that the amount of meadow habitat is decreasing and being replaced by forest habitat. Much of the forest habitat is currently in an early seral stage dominated by dense stands of young trees and tree seedlings that are encroaching on more open meadow habitat. The amount of meadow habitat would continue to decrease if current conditions of ecological succession remained unchecked. Loss of meadow would decrease the amount of suitable habitat for *C. coxii*. This ecological succession is recognized in the Conservation Strategy as one of the primary threats to the viability of *C. coxii*.
There would be no effects on any of the other resources present as a consequnce of "No Action".

III. **Monitoring**

Monitoring would be done in accordance with the ROD/RMP, Appendix I (pp. 84, 190-191, & 195-198), and the "Conservation Strategy for Calochortus coxii, Crinite Mariposa Lily" (pp. 9-11).

Chapter 4
AGENCIES/PERSONS CONTACTED AND PREPARERS

This project was included in the Roseburg BLM Project Planning Update (Winter 1998-99). A notice of decision would be published in the News Review if the decision is made to implement the project.

I. Agencies & Persons Contacted:

Adjacent Landowners
Coquille Indian Tribe
Cow Creek Band of Umpqua Indians
Confederated Tribes of Siletz
Confederated Tribes of Grande Ronde
U.S. Fish and Wildlife Service

II. The following agencies, organizations, and individuals would be notified of the completion of the EA/FONSI:

Oregon Department of Agriculture
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Douglas Forest Protective Association
National Marine Fisheries Service
U.S. Fish and Wildlife Service

III. List of Preparers:

Bill Adams	Fuels Management
Gary Basham	Botany / EA Preparer
Jeannette Griese	Silviculture
Ed Horn	Soils
Frank Oliver	Wildlife
Rob Hurt	Fisheries
Paul Ausbeck	EA Coordinator
John Royce	Management Representative

APPENDIX A

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order.

These resources or values are either **not present** or **would not be affected by the proposed actions or alternative**, unless otherwise described in this EA. This negative declaration is documented below by individuals who assisted in the preparation of this analysis.

ELEMENT	NOT PRESENT	NOT AFFECTED	IN TEXT	INITIALS	TITLE
Air Quality					
Areas of Critical Environmental Concern					
Cultural Resources					
Farm Lands (prime or unique)					
Visual Resources					
Native American Religious Concerns					
Threatened/ Endangered Wildlife Species					
Threatened/ Endangered Plant Species					
Wastes, Hazardous or Solid					
Water Quality Drinking/Ground					
Wetlands/Riparian Zones/Floodplains					
Wild & Scenic Rivers					
Wilderness					