

Conservation Agreement for
***Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*,**
Epilobium oreganum*, and *Viola primulifolia* ssp. *occidentalis
and serpentine *Darlingtonia* wetlands and fens
from Southwestern Oregon and Northwestern California

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EXECUTIVE SUMMARY

This conservation agreement will formally document the intent of the parties involved to coordinate efforts to provide conservation for five rare plant species and their serpentine wetland habitat, commonly known as 'California pitcher plant' (*Darlingtonia californica*) bogs or fens. These serpentine wetland communities are generally dominated by the insectivorous plant, *Darlingtonia californica*, and occur in areas where there is a perennial flow of water, in soils that are ultramafic or serpentine in origin. These wetlands are of particular interest from a conservation perspective because they are the primary habitat for five locally rare, endemic species. These taxa are *Hastingsia bracteosa*, *Hastingsia atropurpurea*, *Gentiana setigera*, *Epilobium oreganum*, and *Viola primulifolia* ssp. *occidentalis*. In addition, small population sizes, isolated occurrences, and sensitivity to disturbance (especially affects to hydrological functioning) render them vulnerable to local extinction. With the exception of one known occurrence for *Gentiana setigera* in Mendocino County, and a few sites for *Epilobium oreganum* in Trinity County, all of the known occurrences of the species, and their habitat, occur in Josephine and Curry Counties of southwestern Oregon and the northern portion of Del Norte County in adjacent California.

The geographic focus of this Conservation Agreement is the western Siskiyou Mountains, which contains the largest, continuous expanse of exposed ultramafic rock (peridotite, serpentinitized peridotite, and serpentinite) in North America, known as the Josephine ophiolite sheet. The Josephine ophiolite sheet covers an area of more than 150 square miles and extends from Southwestern Oregon to Northwestern California.

The goal of this agreement is to identify the essential *Darlingtonia* serpentine wetlands (fens) that support the aforementioned species, to inventory to identify important new habitat, and to coordinate future research to understand the ecology of this system (e.g., plant community, fire ecology, etc.) for the protection of these five rare plant species and their habitat through a coordinated broad scale approach between the Rogue River-Siskiyou and Six Rivers National Forests, Medford and Coos Bay District Bureau of Land Management, and the U.S. Fish and Wildlife Service. The five plant taxa occupying these habitats were candidates for listing under

the Federal Endangered Species Act. Prior to 1996, *Hastingsia bracteosa* was a Category 1 candidate, and the others were Category 2 candidates. Currently all five species are on the Sensitive species list for the Forest Service and the Bureau of Land Management. The agreement will strive to protect both the habitat and populations considered important to these species' conservation based upon such criteria as distribution, population size, and fen community type. In addition to protecting these five federal species of concern, other important locally rare and regional endemic plant species will be conserved, including *Carex scabriuscula* (*C. gigas*), *Carex livida*, *Carex serpenticola*, *Carex sp. novum*, *Castilleja miniata* ssp. *elata*, *Cypripedium californicum*, *Darlingtonia californica*, *Horkelia sericata*, *Lathyrus delnortensis*, *Lilium pardalinum* ssp. *vollmeri*, *Poa bolanderi*, *Perideridia erythrorhiza*, *Pinguicula vulgaris* ssp. *macroceras*, and *Salix delnortensis*.

I. SPECIES OF CONCERN

Hastingsia bracteosa Wats. (large-flowered rush-lily)
Hastingsia atropurpurea Becking (purple-flowered rush-lily)
Gentiana setigera Gray (Mendocino gentian)
Epilobium oreganum Greene (Oregon willow-herb)
Viola primulifolia ssp. *occidentalis* (Gray) L.E. McKinney & R.J. Little (western bog violet)

II. AUTHORITY, GOAL, AND OBJECTIVES

A. The authority for the U.S. Fish and Wildlife Service (Service) to enter into this voluntary Conservation Agreement derives from the Endangered Species Act of 1973 (ESA), as amended; the Fish and Wildlife Act of 1956, as amended; and the Fish and Wildlife Coordination Act, as amended. The Bureau of Land Management (BLM) has authority to enter into this agreement from the ESA and the Federal Lands Policy and Management Act of 1976 as amended. The Forest Service (FS) has authority from the ESA and the National Forests Management Act of 1976 as amended. Each of the three agencies also has individual manual policies that provide for the conservation of rare plant species.

B. The goal of this agreement is to formally document a coordinated conservation effort to provide for the protection and conservation of *Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*, *Epilobium oreganum*, and *Viola primulifolia* ssp. *occidentalis* and conserve unique serpentine wetland habitats.

C. The objectives of this agreement are:

- to formally document the intent of the parties involved to coordinate conservation efforts
- to identify the essential *Darlingtonia* serpentine wetlands (fens) that support the aforementioned species

- to coordinate future research to understand the ecology of this system (e.g., plant community, fire ecology, etc.)
- inventory to identify new suitable and/or occupied habitat

See Appendix A for a list of involved and interested parties.

III. HABITAT DESCRIPTION OF *DARLINTONIA* WETLANDS (see Appendix B and C for a map and more detailed description of identified essential Serpentine fens, in Oregon and California)

Darlingtonia wetlands, locally known as bogs or fens, are areas with a perennial flow of cold water that is either surface or sub-surface, and whose soils are derived from a parent material that is of ultramafic (serpentine) geology. Serpentine substrates support a flora rich in endemic species, as the soils' mineral and chemical composition is unusual and extreme, leading to speciation. Concentrations of heavy metals, i.e., nickel and chromium, are high; while "essential" minerals, like, calcium, nitrogen, and phosphorus are low. Magnesium levels are also high, which acts as an inhibitor of the photosynthetic pathway. *Darlingtonia* wetlands have a unique flora due to the serpentine geology, the intergradations of different floristic regions, as well as the mesic environment of these systems, which are surrounded by typical serpentine xeric conditions. Many plant species are therefore restricted to this system, including the five rare species of which this conservation agreement is interested.

IV. STATUS AND DISTRIBUTION

The five following species are former candidates for federal listing. All have a global or taxonomical rank of 2, which means "imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6 – 20 occurrences" (ONHIC 2004).

Mendocino gentian - *Gentiana setigera*

Gentiana setigera was first listed as a candidate species, Category 2 (C2) for federal listing by the Service (*Federal Register* 45:82480-82569 December 15, 1980) under the name *Gentiana bisetaea* (Waldo gentian). In 1990 (*Federal Register* 55:6184-6229, February 21, 1990), the name in the federal register was changed to *Gentiana setigera* (Mendocino gentian) based on new taxonomic information, although the federal status remained the same. It was changed to a Species of Concern on February 28, 1996 (*Federal Register* 61:7595-7613). It is a Forest Service Region 5 and Region 6 Sensitive Species, is included on the BLM Oregon State Office Sensitive Species List, and is a candidate for listing under the Oregon Endangered Species Act by the Oregon Department of Agriculture (ODA).

The distribution of *Gentiana setigera* roughly outlines the area of this conservation agreement. It is restricted to serpentine wetlands in the Siskiyou Mountain area of southwestern Oregon and

extreme northern California, with one disjunct population from Red Mountain in Mendocino County, California. It occurs mainly in Curry and Josephine Counties in Oregon, and Del Norte County in California. Most of its habitat is found along the west edge of the Illinois Valley from Eight Dollar Mountain south to Oregon Mountain. However, there are a number of small but important occurrences to the west, from Gasquet Mountain in California north to Hunter Creek Bog Area of Critical Ecological Concern, about six miles southeast of Gold Beach and the Pacific Ocean on Coos Bay BLM.

Oregon willow-herb - *Epilobium oregonum*

Epilobium oregonum was first listed as a candidate species, C2 for federal listing by the Service (*Federal Register* 45:82480-82569 December 15, 1980). In 1990, its federal status was changed to Category 3 (C3), based on information on its California distribution (*Federal Register* 55:6184-6229, February 21, 1990). It was re-added to the candidate notice of review in 1993 (*Federal Register* 58:51144-51190, Sept. 30, 1993) as a C2 species. It became a Federal species of concern on February 28, 1996 (*Federal Register* 61:7595-7613). It is a Forest Service Sensitive Species in Regions 5 and 6, a BLM Oregon State Office Sensitive Species, and candidate for listing by the ODA.

Epilobium oregonum is found in serpentine wetlands in the Siskiyou Mountain area of southwestern Oregon and California. It is currently known only from Josephine County, Oregon (along the west edge of the Illinois Valley from Cedar Log Flat south to Oregon Mountain road) and from a disjunct population in the Trinity Mountains in Trinity County, California. Historically, it was known from Nickel Mountain in Douglas County, as well as from seven other California Counties, as far south as Mendocino County. Its current California distribution needs further study.

Large flowered-rushlily - *Hastingsia bracteosa* var. *bracteosa*

Hastingsia bracteosa var. *bracteosa* was a candidate species, Category 1, for federal listing by the Service (*Federal Register* 55:6184-6229, February 21, 1990). It was first made a candidate in 1980 (*Federal Register* 45:82480-82569 December 15, 1980) under the synonym *Schoenolirion bracteosa*. The generic epithet of the taxon was changed to *Hastingsia* in 1983 (*Federal Register* 48:53651) to reflect current taxonomic treatment. It became a Federal species of concern on February 28, 1996 (*Federal Register* 61:7457-7463). It is a Forest Service Region 6 Sensitive Species and is included on the BLM Oregon State Office Sensitive Species List. *Hastingsia bracteosa* var. *bracteosa* is listed as Threatened in Oregon by the ODA.

Hastingsia bracteosa var. *bracteosa* is a local endemic, known only from central Josephine County in Oregon. It is restricted to serpentine *Darlingtonia californica* wetlands and serpentine riparian wetlands around Eight Dollar Mountain, lower Josephine Creek, and Free and Easy Creek.

Purple-flowered rushlily - *Hastingsia bracteosa* var. *atropurpurea*

Hastingsia bracteosa var. *atropurpurea* is a species described by Dr. Rudolph Becking in 1986 (Becking 1986). It was included on the candidate notice of review in 1993 (*Federal Register* 58:51144-51190) as a C2 candidate species for potential listing by the Service under the ESA. It became a Federal species of concern on February 28, 1996 (*Federal Register* 61:7595-7613). It is a Forest Service Sensitive Species in Region 6, a BLM Oregon State Office Sensitive Species, and candidate for listing by ODA. There is currently some debate in Oregon as to whether this should be recognized as a full species (*H. atropurpurea*) or a variety of *Hastingsia bracteosa*. Regardless of its status as a full species or a variety, it remains very rare.

Hastingsia atropurpurea is also a local endemic, known only from central Josephine County in Oregon. It is restricted to serpentine *Darlingtonia californica* wetlands and serpentine riparian wetlands along the western edge of the Illinois Valley, between Rough and Ready Creek and Woodcock Mountain, Eight Dollar Mountain, and upper Josephine Creek. It is as rare and restricted as *Hastingsia bracteosa*.

Western bog violet - *Viola primulifolia* ssp. *occidentalis*

Viola primulifolia ssp. *occidentalis* was first included as a C2 candidate species for federal listing by the Service in 1980 (*Federal Register* 45:82480-82569). In 1985, its federal status was changed to 3C, based on incorrect status information from Oregon. It was again added to the candidate notice of review in 1993 (*Federal Register* 58:51144-51190, Sept. 30, 1993) as a C2 species. It became a Species of Concern on February 28, 1996 (*Federal Register* 61:7595-7613). It is a Forest Service Sensitive Species in Regions 5 and 6, a BLM Oregon State Office Sensitive Species, and candidate for listing by the ODA. Since 1979, the taxon has had a number of name changes. It was originally recognized as *Viola occidentalis*, then as *V. lanceolata* ssp. *occidentalis*, and most recently as *V. primulifolia* ssp. *occidentalis*.

The distribution of *Viola primulifolia* ssp. *occidentalis* is similar to that of *Gentiana setigera*. It is restricted to serpentine wetlands in the Siskiyou Mountain area of southwestern Oregon and northern California. It is currently known only from Curry and Josephine Counties in Oregon, and Del Norte County in California. There is one historical collection in Douglas County. Its habitat is found along the west edge of the Illinois Valley from Eight Dollar Mountain south to Oregon Mountain, and south in the Smith River drainage near the town of Gasquet, and west to Vulcan Peak.

Populations of the following special status plant species will also be afforded conservation under this agreement as they are associated with the fens: *Carex scabriuscula* (*C. gigas*), *Carex livida*, *Carex serpenticola*, *Carex sp. novum*, *Castilleja miniata* ssp. *elata*, *Cypripedium californicum*, *Darlingtonia californica*, *Horkelia sericata*, *Lathyrus delnortensis*, *Lilium pardalinum* ssp. *vollmeri*, *Poa bolanderi*, *Perideridia erythrorhiza*, *Pinguicula vulgaris* ssp. *macroceras*, and *Salix delnortensis*.

V. PRIMARY THREATS

The following criteria are identified in the Endangered Species Act (section 1533.4(a)) as determining factors for Endangered and Threatened species. Threats to species associated with *Darlingtonia* wetlands are outlined in the context of these criteria.

A. The present or threatened destruction, modification, or curtailment of the taxa's habitat or range.

Hydrology

Any alteration of the hydrology of a *Darlingtonia* wetland has the potential to drain water away from the wetland and its associated plants. As indicated by the Borgias and Biegel 1996 study, the hydrological regime of the *Darlingtonia* wetland environment is perhaps the most critical component of *Darlingtonia* wetland communities and their associated rare plant habitat. Mining and its related activities, Off Highway Vehicle (OHV) usage, road construction and maintenance, fire suppression activities, and domestic use/water siphoning all have the potential to affect hydrologic processes by accelerating or diverting water runoff.

Mining and its related activities The primary reason for the potential listing of *Hastingsia bracteosa* and *Hastingsia atropurpurea* has been the threat of commercial mining in and adjacent to their habitats. There are mining claims in and around many of the *Darlingtonia* wetlands that provide habitat for these five species.

- Suction dredging in streams is a common gold mining activity which probably does not affect habitat for the five taxa to any large extent. Larger scale mining of serpentine associated minerals (nickel, chromium, copper, and gold) has been proposed multiple times in the past but is not actively occurring at this time. This kind of mining would clearly pose a threat to these taxa if undertaken in areas where they occur. It is possible that mining activities would increase if the price of these metals makes it lucrative.
- The commercial mining at Nickel Mountain was likely responsible for the loss of the Douglas County population of *Epilobium oreganum* and *Viola primulifolia* ssp. *occidentalis*.

Road Construction and Maintenance Road construction, primarily associated with mining, has occurred extensively on Eight Dollar Mountain, along Josephine Creek, and throughout the North Fork of the Smith River drainage, particularly Gasquet Mountain. The majority of these roads are compacted bulldozed tracks. Where roads go through or occur near *Darlingtonia* wetlands and/or creek beds they can alter the hydrologic patterns by intercepting water and channeling it downslope along the roadbed, thereby removing water from the system. Becking (1982) describes a *Darlingtonia* wetland on private property where up slope logging and road building coupled with the excavation of the adjacent slope seemed to have caused the wetland to

dry out. Pulling ditches along roads can destroy roadside populations. Examples of this occur on roads near Game Lake, Snow Camp, and Iron Mountain on the Rogue River -Siskiyou National Forest.

Off Highway Vehicle Use Aside from the actual road construction, some populations have been threatened by OHV use. *Darlingtonia* wetlands near roads and trails are at risk from this activity (see discussion above). There are repeated occurrences of OHV damage in *Darlingtonia* wetlands.

Fire Suppression Activities Fire suppression activities including handline, dozerline, and heli-spot construction pose threats to the hydrologic setting of *Darlingtonia* wetlands. Fire line construction can divert water flow away from the wetland plant community resulting in disruption of the wetland system and the associated rare plants.

Water Siphoning/Domestic Water Use Expanding agricultural and rural residential water usage in Josephine and Del Norte counties has led to increased domestic pressure on the seeps and springs feeding the fens resulting in less water for the wetlands. Some recent diversions have adversely affected *Darlingtonia* wetlands and their associated habitat.

Altered Fire Cycles

The presence of burned snags in *Darlingtonia* wetlands and on the upper slopes of Eight Dollar Mountain indicates that fire occurred with some frequency in the past. With the arrival of immigrants 100-150 years ago, the incidence of fire has been greatly reduced. Atzet and Wheeler (1982) studied the frequency of fire in southwest Oregon, and indicate that fire has been a significant and important part of the environment, shaping plant communities in southwestern Oregon. Fires would likely have been a mosaic burn with shorter fire intervals.

The affect of altered fire cycles within the *Darlingtonia* wetland system is largely unknown (Frost *et al.* 2004). Shrub and tree encroachment leads to higher transpiration rates, increased cover, and reduced light available to low growing forbs. This leads, in general, to less habitat for rare wetland associated species. Fire intensity is increased by the combination of increased fuel loading and altered fire cycles. This can result in increased soil erosion. Of the five species, *Epilobium oreganum*, can tolerate the most cover, and therefore may be least affected by encroaching vegetation. In contrast, *Gentiana setigera*, *Viola primulifolia* ssp. *occidentalis*, *Hastingsia atropurpurea* and *Hastingsia bracteosa* appear to prefer open habitats (Frost *et al.* 2004).

High intensity burns during the 2002 Biscuit fire in *Darlingtonia* wetlands did not appear to have immediate adverse effects to the five rare species on the Six Rivers National Forest (Frost *et al.* 2004). Prescribed fire (either natural or planned ignitions) in and around the fens may be a possible management tool to help maintain the wetlands and arrest shrub/tree encroachment.

B. Overutilization for commercial, recreational, scientific, or educational purposes

The five target plant species covered by this agreement have been collected and used for commercial, scientific, and/or educational purposes. The agencies require a permit for the collection of these species including *Darlingtonia*, and regulate and discourage collections. Illegal collections, however, do occur. Veva Stansell (pers. comm. 2004) reports that in the 1940's, an individual from Gold Beach collected 10,000 *Darlingtonia californica* plants from a fen 7 miles north of Gold Beach, then sold them to a nursery in Portland. Upon returning to this site in the 1980's, not one individual was found. She believes this could also have been due to Highway 101 altering the hydrology. In the past, *Darlingtonia californica* was commonly sold, and is still available from specialty nurseries. Both *Gentiana setigera* and *Viola primulifolia* can be found for sale on the internet from native plant nurseries.

C. Disease or predation

Browsing of *Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*, and *Viola primulifolia* ssp. *occidentalis* and *Epilobium oreganum* does not appear to be significant.

Many of the *Darlingtonia* wetlands have populations of Port-Orford-cedar (*Cupressus lawsoniana*), many of which are currently infected with the Port-Orford-cedar root rot (*Phytophthora lateralis*) disease, or that are close to areas of infection. The effect of the loss of Port-Orford-Cedar to the *Darlingtonia* wetland community is unknown, as they are an integral structural component. While the disease may not infect the five target species, the removal of the trees along roads adjacent to these wetlands could directly impact the rare plant populations and indirectly impact the habitat by altering the hydrology.

D. The inadequacy of existing regulatory mechanisms

None of the species occurring in these *Darlingtonia* wetlands are federally listed, and therefore, none receive protection under the ESA. *Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*, *Epilobium oreganum* are state listed as Endangered in Oregon, but the state's endangered species act is not adequate to protect any of the species or their habitat because these species largely are found on federal land, and the state does not have jurisdiction over the management of these lands. All five of these species are on the agencies' sensitive species list, which affords some degree of protection relative to actions occurring on lands administered by the FS and BLM (Forest Service manual 2670.32; BLM manual 6840).

Agency mining regulations require miners to submit a Notice of Intent or Plan of Operations. Habitat assessments, surveys, and mitigation measures are then required to conserve and protect occurrences of federally listed species. Agency sensitive species do not receive this protection, and measures to protect these taxa are discretionary.

E. Other natural or manmade factors affecting their continued existence

Only one fen within this agreement is within a federal grazing allotment, the Eight Dollar Mountain fen on Medford BLM. This allotment has been vacant for several years. Recently, the Grants Pass Area Manager dropped this pasture from the allotment to protect the site (BLM 2005). Permitted grazing is no longer a threat to any of the sites.

Currently there are several invasive species within the region that have the potential to invade these systems and cause major community compositional shifts (i.e. purple loosestrife, Japanese knotweed, poison hemlock, Himalayan blackberries, meadow knapweed, etc.). While this is not a current issue, future weed control efforts within these systems would cause additional mortality as both physical and chemical control efforts would involve trampling and/or adjacent plant mortality.

VI. CONSERVATION AGREEMENT

The U.S. Forest Service, Rogue River-Siskiyou and Six Rivers National Forests, and the U.S. Bureau of Land Management, Medford and Coos Bay Districts, agree to the following:

- A. Manage the *Darlingtonia* wetlands and protect their significant biological and ecological functions and values, consistent with current law, policy, and existing management plans.
- B. Cooperate on management issues and planning related to the *Darlingtonia* wetlands/fens that contain target species. This cooperation includes sharing data, coordinating studies and research, and implementing a standardized monitoring protocol.
- C. Manage all *Darlingtonia* wetlands deemed essential to conserve *Epilobium oreganum*, *Hastingsia bracteosa*, *Hastingsia atropurpurea*, *Gentiana setigera*, and *Viola primulifolia* ssp. *occidentalis* and other associated species.

The essential *Darlingtonia* wetlands (see appendix) represent the full range of genetic and ecosystem diversity of the most wide ranging of these sensitive species and their habitat, and include the largest populations as well. The criteria used to select these *Darlingtonia* wetlands were adopted from the 1987 draft Species Management Guides for *Gentiana setigera*, *Epilobium oreganum*, and *Hastingsia bracteosa* (including *H. atropurpurea*), and sites were selected based upon the presence of the target sensitive plant species, geographic distribution, and population parameters such as size. For example, populations occurring at elevational extremes were selected if this varied for a species, (as it does for *Gentiana setigera* and *Viola primulifolia* ssp. *occidentalis*). Plant populations occurring in the full array of fen and ecosystem types were selected, so that hill slope, streamside, and terrace fens at elevational extremes were selected for each taxon. Whenever possible, fens in previously designated protected areas (Research Natural Areas, Botanical Areas, Areas of Critical Environmental Concern, etc.) were selected, as were fens with populations of multiple species. Additional *Darlingtonia* wetlands can be designated

as essential in the future where appropriate.

D. Develop and finalize a Conservation Strategy for *Hastingsia bracteosa*, *H. atropurpurea*, *Epilobium oreganum*, *Viola primulifolia ssp. occidentalis*, and *Gentiana setigera* and serpentine *Darlingtonia* fens and wetlands within an ecosystem context within the next three years. The Conservation Strategy would identify specific actions to protect the *Darlingtonia* wetlands from threats identified above.

Specifically the FS, Rogue-Siskiyou and Six Rivers National Forests, and the BLM, Medford and Coos Bay Districts agree to:

- 1) Develop funding sources to finalize the *Darlingtonia* wetland conservation strategy.
- 2) Finalize and implement, as funding and staff allow, a standardized monitoring protocol, which will be used throughout the species range to determine if populations are stable, expanding, or declining. This should establish a baseline for population numbers of each taxon in the critical fens so to understand the variability of populations and the trends. Substantial progress has already occurred in the development of a monitoring protocol as well as determining baseline population numbers and establishing permanent plots in essential *Darlingtonia* wetlands (Frost et al. 2004; Cramer and Frost 2005). This monitoring should include the identification of any threats such as road development, water diversions, OHV use, encroachment of trees and/or shrubs and unauthorized plant collection.
- 3) Continue surveys and inventories in suitable habitat within the range of *Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*, *Epilobium oreganum* and *Viola primulifolia ssp. occidentalis* so as to identify new occurrences and to determine the status of populations which are not monitored.
- 4) Clarify the extent and status of *Epilobium oreganum* in California, including a taxonomic review of all California specimens over the next three years.
- 5) Provide monitoring reports to the Service by September 30 of every odd numbered year for the duration of the agreement. The bi-annual report will include:
 - a. A review of any new mining claims or mineral withdrawals that could affect the any of the fens considered important for these species.
 - b. A review of any impacts from mining, OHV, succession, or other impacts to the essential fens.
 - c. A review of the monitoring or other research efforts.
- 6) Review, and if necessary, amend the BLM's Resource Management Plan and the Forest Service's Land Management Plan to incorporate the essential fens.

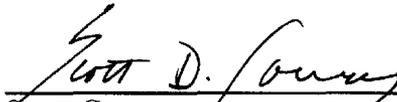
The Service agrees to:

- A. Provide technical assistance in the implementation of this Conservation Agreement to ensure that adequate management and protection is occurring. Cooperate in cost-sharing and development of funding sources for studies and similar actions specific to the Conservation Strategy as funding and staff levels allow.
- B. Provide technical assistance in the development of the monitoring protocol and specific monitoring study proposals for the five *Darlingtonia* wetland and fen species. Assist with monitoring as funding and staff levels allow.
- C. Cooperate with federal and state agencies and other interested parties to develop studies, research projects, and restoration projects that further the implementation of this Conservation agreement.
- D. Share new information on *Epilobium oreganum*, *Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*, and *Viola primulifolia ssp. occidentalis* to all of the agencies which are part of this agreement.
- E. Re-evaluate the status of *Epilobium oreganum*, *Hastingsia bracteosa*, *H. atropurpurea*, *Gentiana setigera*, and *Viola primulifolia ssp. occidentalis* biannually or as needed and propose appropriate action or modifications of any species status changes.

VII. DURATION OF AGREEMENT

This agreement shall become effective with the signature of the last approving agency official. It can be terminated in writing at any time the Rogue River-Siskiyou National Forest, the Six Rivers National Forest, the Medford District of the BLM, the Coos Bay District of the BLM, the Service's Oregon Fish and Wildlife Office, or the Arcata Fish and Wildlife Office determine the agreement is no longer necessary, with a 30 day notice to all parties.

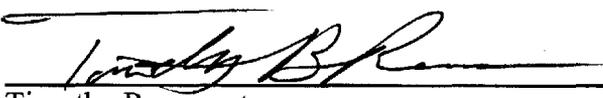
VIII. SIGNATURES



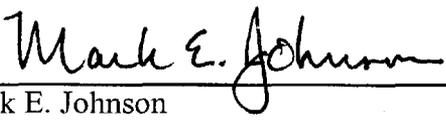
Scott Conroy
Rogue River-Siskiyou National Forest Supervisor
Date 5-26-06



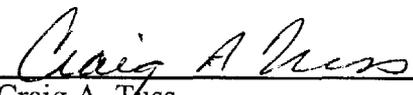
William Metz
Acting Six Rivers National Forest Supervisor
Date 5/16/06



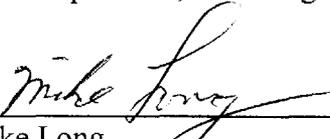
Timothy Reuwsaat
District Manager, Medford District, BLM
Date 6/9/06



Mark E. Johnson
District Manager, Coos Bay District, BLM
Date 6/14/06



Craig A. Tuss
Field Supervisor, Roseburg Field Office, USFWS
Date 6/29/06



Mike Long
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APPENDIX A

Involved Parties

U.S. Fish & Wildlife Service

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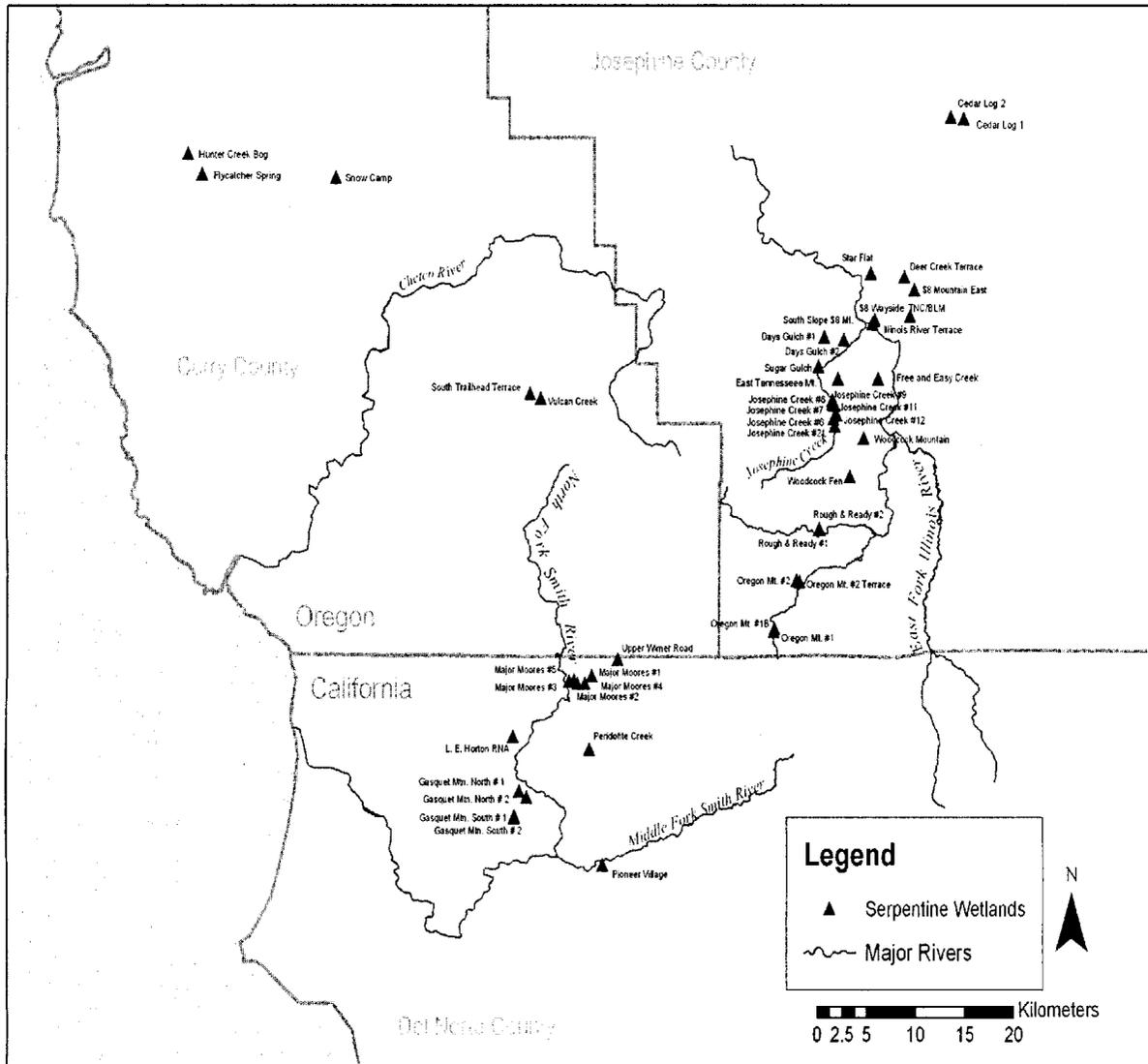
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APPENDIX B

General Distribution Map of *Darlingtonia* wetlands that support *Epilobium oregonum*, *Hastingsia bracteosa*, *Hastingsia atropurpurea*, *Gentiana setigera*, or *Viola primulifolia* ssp. *occidentalis*



APPENDIX C

Essential Oregon *Darlingtonia* wetland areas that support occurrences of *Hastingsia bracteosa*, *Hastingsia atropurpurea*, *Gentiana setigera*, *Epilobium oregonum*, or *Viola primulifolia* ssp. *occidentalis*

The agencies responsible for the management of *Darlingtonia* wetlands in each of the areas are included in parenthesis. The justification for the selection of the wetland is also included.

1. Cedar Log RNA (Galice RD), two fens only - This represents the northern edge of the range of *Epilobium oregonum* on two localized, hill slope fens (one fairly open, one with some shrub and tree cover) in an established RNA. a) Cedar Log Flat north fen, b) Cedar Log Flat south fen.

2. West Eight Dollar Mountain-Illinois River-Star Flat (Illinois Valley RD) – Eight Dollar Mountain Botanical Area has a very large, low gradient, river terrace fen, with both *Darlingtonia* and graminoid dominated areas, as well as riparian habitats. It has very large populations of *Epilobium oregonum*, *Gentiana setigera* and *Hastingsia bracteosa*, and is part of a Botanical Area. The south slope of Eight Dollar Mountain Botanical Area has a number of interconnected, narrow but long, high gradient *Darlingtonia* fens with good populations of *Gentiana setigera* and *Hastingsia bracteosa*, and small populations of *Viola primulifolia* ssp. *occidentalis* and *Epilobium oregonum*. Below these along the Illinois River, is a large, river terrace fen with the largest population of *Epilobium oregonum* and good populations of *Gentiana setigera* and *Hastingsia bracteosa*. a) Star Flat *Darlingtonia* wetland (within the Eight Dollar Mountain Botanical Area), b) south slope Eight Dollar Botanical Area *Darlingtonia* wetland, c) Illinois River/Wild and Scenic River terrace fen.

3. East Eight Dollar Mountain (Medford District BLM). This includes three widely spaced wetlands which could be considered to be three separate areas. At the north is a good sized hillslope fen with a large population of *Hastingsia bracteosa* and a small population of *Gentiana setigera*, which (along with Star Flat) represents the northern limit of these species ranges. Further south, it includes a smallish, hillslope fen on the boundary between State and BLM Land, with small populations of *Gentiana setigera*, *Hastingsia bracteosa*, *Viola primulifolia* ssp. *occidentalis* representing the northern limit of this latter's species range. The last wetland is a series of large, hanging fens and streamside seeps along the boundary between the BLM ACEC and a The Nature Conservancy preserve with large populations of *Gentiana setigera* and *Hastingsia bracteosa* and a very small population of *Epilobium oregonum*. a) The Nature Conservancy- Medford BLM ACEC wetland, b) Department of State Lands -Medford BLM ACEC wetland, c) Deer Creek wetland - note, the large BLM wetland along Eight Dollar road is excluded.

4. Josephine Creek-Days Gulch (Illinois Valley RD) - This area includes wetlands located along Josephine creek, from the headwaters to the mouth, and in the Days Gulch Botanical Area.

Most are outstanding wetlands with high densities of all five taxa. These taxa co-occur only within a very limited range, and the Josephine fens are critical to maintaining the gene flow, resiliency, and meta-population dynamics. Some of the local fens are included largely because they were selected as key in the Species Management Guide for *Gentiana setigera*, and have excellent populations of *Hastingsia bracteosa*, at the southern limit of its range. A few of the fens occur adjacent to some active mines, and are among the largest and best quality fens in Oregon. One of the fens has recently burned, and is part of an ongoing study. The area includes essential populations of *Epilobium oreganum* and *Hastingsia bracteosa*.

a) Days Gulch Botanical Area, b) SW Sec. 35 wetland, c) north ford wetland (SW Sec. 12), d) south ford wetland (SW Sec. 13), e) SW Sec. 26 wetland, f) Josephine Creek bend wetland and g) NW Sec. 25 wetland (e. of Josephine Cr.).

5. Northwest Illinois Valley - These are unusual wetlands, with populations of all the target species. They include important habitat for *Hastingsia*, with the only known populations intermediate between *Hastingsia atropurpurea* and *Hastingsia bracteosa*, along with large *Gentiana setigera* populations. a) Free and Easy Creek (Medford BLM); b) west Sauers Flat (Illinois Valley RD); c) east Tennessee Mountain (Medford BLM).

6. Central West Illinois Valley - These are large and important wetlands, including the type location for *Hastingsia atropurpurea*, and what is probably the most southerly population of *Hastingsia atropurpurea* (Rough and Ready). The fens were selected in the conservation strategy for *Gentiana setigera*, and protect a number of other serpentine endemic plants. One site, Woodcock Bog, is already an established Research Natural Area. a) Woodcock Bog RNA (Medford BLM), b) SE Sec. 19 wetland (Medford BLM), c) Rough & Ready Wetland Complex (Illinois Valley RD).

7. Oregon Mountain Wetlands - These, and the three below, include wetlands selected for conservation in the management guides for *Epilobium oreganum* and *Gentiana setigera*. They also include the largest populations in Oregon of *Viola primulifolia* ssp. *occidentalis*. The USFS wetland is in a Botanical Area. a) North Whiskey Creek complex wetlands (Illinois Valley RD), b) Whiskey Creek wetland (Medford BLM), c) Sec. 9 wetland (Medford BLM).

8. Wimer Road wetlands (Illinois Valley RD) - As well as being included in Conservation Strategies for two species, these are large and diverse fens in the established Oregon Mountain Botanical Area. a) East Wimer Road terrace wetland, b) Wimer Hanging wetland, c) North Stone Corral wetland.

9. Lemmingsworth Gulch RNA (Chetco RD) - Both fens are contained within a large RNA, and were selected in the Conservation Strategy for *Gentiana setigera*. a) upper Packsaddle Gulch Creek wetland, b) Packsaddle trail wetland.

10. Vulcan Lake-Vulcan trailhead (Chetco RD) - This area is at the western edge of the range, and was selected in the conservation strategy for *Gentiana setigera*. One of the wetlands is in an established Wilderness Area. a) Vulcan Lake wetland, b) south trailhead terrace wetland, c) roadbend hillslope wetland.

11. Hunter Creek Coastal area - These represent the western edge of the range of *Gentiana setigera*, and a unique area close to the coast. They were chosen in the Conservation Strategy for *Gentiana setigera*. Two are BLM sites a) Hunter Creek Bog ACEC (Coos Bay BLM), b) Hunter Springs Bog (Coos Bay BLM), c) Flycatcher Springs wetlands (Gold Beach RD).

12. Snow Camp (Chetco RD) - one site only - This represents an extremely large and high quality wetland, at the extreme northern and western edge of the range of this type. It was selected in the *Gentiana setigera* Conservation Strategy, and is in the Snow Camp Botanical Area a) Snow Camp wetland.

APPENDIX C (continued)

Essential California *Darlingtonia* wetland areas that support occurrences of *Gentiana setigera* or *Viola primulifolia* ssp. *occidentalis*

Six Rivers National Forest is the agency responsible for the management of *Darlingtonia* wetlands at all sites noted below. All sites occur within the Smith River National Recreation Area. All sites are within the North Fork of the Smith River watershed except for the Gasquet Mountain South sites and the Pioneer Village site. *Hastingsia bracteosa*, and *Hastingsia atropurpurea* are not known to occur in California. To date, *Epilobium oreganum* does not occur within the geographic focus of this Conservation Agreement in California.

The following sites were selected because of their distribution across the landscape, their subpopulation size, and verification by recent field visits (Carothers 2004; Frost et al. 2004).

15. Upper Wimer Road - One fen within North Fork Smith Botanical Area containing a population of *Viola primulifolia* ssp. *occidentalis* occurring at the top of the Wimer Road (County Road 4402) near the state border. This is the most northerly site in California.

16. Major Moores - Five streamside fens within North Fork Smith Botanical Area, three occurring along an unnamed tributary flowing into the North Fork of the Smith River (three with *Viola primulifolia* ssp. *occidentalis* and *Gentiana setigera*, two with only *Gentiana setigera*), and two occurring along an unnamed tributaries flowing into Diamond Creek (both with *Gentiana setigera*).

17. Peridotite Creek – One streamside fen within North Fork Smith Botanical Area containing *Gentiana setigera*.

18. L.E. Horton Research Natural Area One large terrace fen containing both *Viola primulifolia* ssp. *occidentalis* and *Gentiana setigera*.

19. Gasquet Mountain North - Two streamside fens containing both *Viola primulifolia* ssp. *occidentalis* and *Gentiana setigera*.

20. Gasquet Mountain South - Two fens in close proximity (150 meters) containing *Viola primulifolia* ssp. *occidentalis* and one containing *Gentiana setigera*. These two fens are within the Hardscrabble Creek watershed, a tributary of Smith River.

21. Pioneer Village- One hillslope fen containing *Viola primulifolia* ssp. *occidentalis*. This fen is within the Middle Fork Smith drainage to the east of the Pioneer Village subdivision. This is the southern-most occurrence of *Viola primulifolia* ssp. *occidentalis*.

REFERENCES

- Atzet, T. and D. Wheeler. 1982. Historical and Ecological Perspectives on Fire Activity in the Klamath Geological Province of the Rogue River and Rogue-Siskiyou National Forests. USDA-Forest Service, Pacific Northwest Region, R6-Range-102-1982.
- Becking, R. 1982. Final Report. *Schoenolirion bracteosum* Ecological Investigations. USFS Six Rivers National Forest. Contract No. 43-9A47-0-1645. 17 pp.
- Becking, R. 1986. *Hastingsia atropurpurea* (Liliaceae: Asphodeleae), A New Species from Southwest Oregon. Madrono 33: 175-181.
- Bureau of Land Management (BLM). 2005. Anderson West Environmental Assessment. Grants Pass, Resource Area, Medford District. Grants Pass, Oregon.
- Carothers, S. 2004. Brief Summary of Monitoring Results for 2004 Field Visits to *Gentiana setigera* A. Gray and *Viola occidentalis* L. ssp. *primulifolia* (Gray) L.E. McKinney & R.J. Little in *Darlingtonia* Fens in the Smith River National Recreation Area. Unpublished report on file at Supervisor's Office, Six Rivers N.F. Eureka, California.
- Cramer J.R. and E.J. Frost. 2005. The Flora of Serpentine Fens in the Klamath – Siskiyou Region after the Biscuit Fire. Unpublished report on file at Supervisor's Office, Six Rivers N.F. Eureka, California.
- Frost, E.J., R.J. Sweeney, W.L. Bigg. 2004. Distribution and Environmental/Habitat Relations of Five Endemic Plants associated with Serpentine Fens in Southwest Oregon and Northwest California. Unpublished report on file at Supervisor's Office, Six Rivers N.F. Eureka, California.
- Oregon Natural Heritage Information Center. 2004. Rare, Threatened and Endangered Species of Oregon. Portland, Oregon. 105 pp.
- U.S. Fish and Wildlife Service. 1980. Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species; notice of review. Federal Register 45(242):82480-82569 (15 December 1980).
- U.S. Fish and Wildlife Service. 1985. Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species; notice of review. Federal Register 50(188):39526-39584 (27 September 1985).
- U.S. Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; review of

plant taxa for listing as endangered or threatened species; notice of review. Federal Register 55(35):6184-6229 (21 February 1990).

Personal Communication

Stansell, V. 2004. Pistol River, Oregon.