



U.S. Fish and Wildlife Service



SAFE HARBOR AGREEMENT
For Fender's Blue Butterfly
(*Icaricia icarioides fenderi*)
& Kincaid's Lupine
(*Lupinus sulphureus kincaidii*)



U.S. FISH AND WILDLIFE SERVICE
AND CLEMENS & BARBARA STARCK

OREGON FISH AND WILDLIFE OFFICE

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**SAFE HARBOR AGREEMENT
WITH CLEM AND BARBARA STARCK
FOR VOLUNTARY ENHANCEMENT/RESTORATION ACTIVITIES
BENEFITTING KINCAID'S LUPINE
AND FENDER'S BLUE BUTTERFLY
AT THE DALLAS OAK SAVANNA**

May 2004

1. INTRODUCTION

This Safe Harbor Agreement (Agreement) is entered into between Clem and Barbara Starck (Cooperator) and the U.S. Department of the Interior, Fish and Wildlife Service (Service), hereinafter collectively called the "Parties." The purpose of this Agreement is to contribute to the recovery of Fender's blue butterfly (*Icaricia icarioides fenderi*) and Kincaid's lupine (*Lupinus sulphureus kincaidii*) through increasing the understanding of oak savanna restoration and Kincaid's lupine propagation and introduction techniques. These types of restoration projects increase suitable habitat and can contribute to the recovery of both Fender's blue butterfly and Kincaid's lupine. This Agreement follows the Services Safe Harbor Agreement final policy (64 FR 32717) and regulations (64 FR 32706), both of which implement section 10(a)(1)(A) of the Endangered Species Act (ESA).

The Safe Harbor program encourages proactive conservation efforts by non-federal landowners while providing them certainty that future property-use restrictions will not be imposed if those efforts result in increased numbers of listed species, in this case Fender's blue butterflies or Kincaid's lupine. In return for voluntary conservation commitments, this Agreement will extend assurances to the Cooperator, allowing future alteration or modification of the enrolled property to its original baseline conditions. Without this cooperative effort, the enrolled lands would not otherwise be utilized by these species in the foreseeable future.

2. LIST OF COVERED SPECIES

This Agreement covers the following federally listed species, which are hereafter referred to as the "covered species": Fender's blue butterfly and Kincaid's lupine. When signed, this Agreement will serve as the basis for the Service to issue a permit under ESA section 10(a)(1)(A) for the take of covered, listed species associated with the potential future return of the Cooperator's enrolled lands to baseline conditions. The permit will authorize the Cooperator to take all individuals of the species, and their progeny, that are introduced to the enrolled lands or have increased in numbers or distribution on those lands, as a result of the Cooperator's voluntary conservation activities. The Parties anticipate that the maximum level of take authorized under this Agreement and permit will never be realized. Permit issuance will not preclude the need for the Cooperator to abide by all other applicable Federal, State, and local laws and regulations that may apply.

Biological information for the covered species can be found in Appendix 1. This agreement will represent a net conservation benefit to the covered species (see Appendix 2).

3. DESCRIPTION OF ENROLLED LANDS

The property subject to this Agreement (Dallas Oak Savanna) consists of approximately 20 acres and is located near the city of Dallas, in Polk County, Oregon. The property is a small farm

located on a south facing hillside off of Guthrie Road, four miles south of Dallas, Oregon (**Figure A**).

The Cooperator enrolled into the Service's Partners for Fish and Wildlife (PFW) Program in May 2001 (Agreement #13420-1-J134) (Appendix 3). The PFW Program provided technical expertise and funding to assist with restoration of approximately 20 acres of upland prairie oak savanna habitat. These lands include two hay pastures, one approximately 15 acres (Area A), and the other approximately five acres (Area B) (**Figure B**) and are the lands to be enrolled into this Agreement. Both fields had been previously planted with introduced pasture grasses, including tall fescue (*Festuca arundinacea*) and velvet-grass (*Holcus* sp.), for haying and grazing. The historic native plant community was dominated by widely scattered Oregon white oak (*Quercus garryana*) trees with an understory of native bunch grasses and forbs. Restoration activities associated with the PFW Agreement were initiated in the Summer of 2001 and are planned through 2004. Lupine plantings will continue until an agreed upon number of seeds and seedlings are introduced, possibly through 2005. The Kincaid's lupine introduction plan can be found in Appendix 4.

The hydrology prior to agriculture and settlement would have been much as it is today. Two ephemeral natural drainages are on either side of Area A, one of which is fed by a spring. Both fields are comprised entirely of upland habitat types with the possible exception of the small drainage that crosses the Area A. A grassed waterway was constructed on this drainage at one time, but it is no longer functioning. Hay was cut on both fields annually until 2000, when the lessee retired. The upper watershed, under separate ownership, was planted with Douglas-fir for timber harvest. A large portion was clearcut in fall 2001.

The only native plants in the enrolled lands were in the two drainages on either side of Area A and an area along one edge of Area B. Additionally, there is one large Oregon white oak and several scattered oak seedlings within the enrolled lands. Both fields were covered with Queen Anne's lace (*Daucus carota*) with Himalayan blackberries (*Rubus discolor*) growing along the edges of the fields and spreading to the interior. Soils within the enrolled lands are Rickreal silty clay loam which occurs on 12-20 percent slopes. This soil type has a rooting depth of 12-20 inches and a water holding capacity of 2-3 inches. Native plant communities supported by this soil type include an overstory of Oregon white oak with a mix of grass, poison oak, and wild rose in the understory. These soil properties are suitable for reintroduction of Kincaid's lupine (Tom Kay, Institute for Applied Ecology, pers. comm. 2000).

There is one small population of Kincaid's lupine within 0.5 mile of the enrolled lands and a larger population within 8 miles. There are two populations of Fender's blue butterfly within one mile of the enrolled lands, but both populations are nearing extinction (less than 10 butterflies at each site). One of these populations is in an area of spur lupine (*Lupinus arbustus*), rather than Kincaid's lupine. Fender's blue butterfly dispersal to the Dallas Oak Savanna from existing populations is possible given that Fender's blue dispersal distance between lupine patches is estimated to be more than 1.2 miles (Schultz 1997). However, natural colonization of Dallas Oak Savanna by Fender's blue butterflies is unlikely at the present time for the following reasons: low population levels at nearby occupied sites, limited suitable habitat within dispersal corridors, and small initial size of introduced lupine population.

4. BASELINE DETERMINATION

The baseline condition of the Dallas Oak Savanna was determined based on the presence or absence of Kincaid's lupine prior to introduction efforts for that species. Kincaid's lupine

blooming period, from May to July, is the best time to identify the species. Field surveys by Service staff in 2001 and 2002 resulted in zero occurrences of Kincaid's lupine, spur lupine and sickle-keeled lupine (*L. albicaulis*) at the site. Therefore, baseline condition for Dallas Oak Savanna is zero (i.e., the site is not occupied by Kincaid's lupine or Fender's blue butterfly).

5. MANAGEMENT ACTIVITIES

The Cooperator, or designee thereof, may carry out the following management activities on 20 acres of land with the intent of restoring and maintaining oak savanna habitat that can support Kincaid's lupine and possibly Fender's blue butterfly.

The following management actions under the Agreement will benefit oak savanna and Kincaid's lupine :

- *Mow, remove thistle seed heads, spot spray and implement other necessary means on an annual or biennial basis to reduce non-native species and restore native savanna species.*

Non-native grasses and forbs dominated the Dallas Oak Savanna understory prior to restoration. Combinations of mowing, shallow disking, and herbicide were initiated in 2001 to reduce vigor of these species. A no-till drill was used for dormant seeding of native grass species, including California brome (*Bromus carinatus*), blue wild rye (*Elymus glaucus*), California oat grass (*Danthonia californica*) and native forb species including nectar sources for the Fender's blue butterfly.

- *Remove invading conifers or oaks, control invasive plants, and encourage native plant species through re-seeding or other methods for the 15-year duration of the Agreement.*
- *Starting in 2005, take the lead on watering, weeding, and protecting from browsing the white oaks planted through the PFW Program, and plant additional native oaks, as needed, if substantial oak mortality occurs during the term of the Agreement.*

Native Oregon white oak is the key overstory component to Willamette Valley oak savanna habitats. Twenty-five 2-gallon Oregon white oaks were planted in fall of 2002. Oak growth and survivorship will be enhanced by weeding of competing vegetation, protection from deer browse, and watering. The PFW Program will take the lead on oak maintenance in 2003 and 2004, the most critical years.

- *Implement mowing, prescribed burning or other techniques to prevent succession and maintain oak savanna character, if not being carried out by the Service.*
- *Allow the Service (and designees thereof) access to the property to introduce Kincaid's lupine, conduct restoration activities, monitor populations and habitat conditions, and collect lupine seed for establishment or enhancement of new populations.*

Restoration activities under the PFW Program (as described in Appendix 3) will continue through 2004 with a minimum of two years of post-project monitoring. Future

management or site inspections to determine long-term success of oak savanna restoration efforts and Kincaid's lupine introduction are likely to occur. Adequate advance notice will always be provided to the Cooperator.

- *Allow the Service (and designees thereof) access to the property to introduce Fender's blue butterfly and monitor population.*

If deemed beneficial for Fender's blue butterfly recovery, the landowner will allow the Service (or designee thereof) to introduce a Fender's blue butterfly population at Dallas Oak Savanna. Service recovery plan guidelines (in development) will be followed. Future monitoring to determine long-term success of the introduction is likely to occur. Adequate advance notice will always be provided to the Cooperator.

- *Provide annual reports starting in 2005 (completion of the active restoration phase of the PFW Program). These reports will describe management activities undertaken during the previous year and anticipated management activities for the upcoming year. Additionally, these reports will document butterfly use of the site, if appropriate, in order to notify the Service that a survey will need to be conducted. The first report will be due on September 30, 2005.*
- *Should the site become colonized by the Fender's blue butterfly, reduce potentially disturbing actions during the breeding season of the Fender's blue butterfly (April through June), to minimize any possible disruption of reproductive efforts and ensure all management is compatible with Service-approved Fender's blue butterfly management techniques (Appendix 5, or most current Service-approved protocol).*

The voluntary conservation actions listed above should increase the population sizes of the Fender's blue butterfly and Kincaid's lupine by improving the quality of the habitat. Without such efforts, it is likely that invasive species would outcompete Kincaid's lupine, and would eventually lead to extinction of the butterfly as a result of loss of larval host plants.

Nothing in this Agreement prevents the Cooperator from implementing management activities not described in the Agreement, as long as such actions maintain or enhance native oak savanna habitat and do not affect the beneficial actions set forth in the Agreement.

6. OTHER RESPONSIBILITIES OF THE PARTIES

- A. In addition to carrying out the management activities set forth in section 5, the Cooperator agrees to:

- *Compliance monitoring access.*

Allow the Service, after reasonable prior notice, the right to enter the Cooperator property for the purpose of ascertaining compliance with the Agreement and for survey and monitoring.

- *Take Notification.*

The Cooperator will provide the Service with written notice 60 days prior (or per agreement by both parties, notice of sufficient amount of time to allow for movement of

lupine plants, seeds, or Fender's blue butterfly eggs, larvae, or adults) to implementing any land use activities which may result in take of Fender's blue butterfly, or destruction of Kincaid's lupine. Upon receipt of notice, the Service or their designee may relocate one or both affected species, if deemed practical or necessary by the Service.

- *Notification of return to baseline.*

Notify the Service 60 days prior (or per agreement by both parties, notice of sufficient amount of time to allow for movement of lupine plants, seeds, or Fender's blue butterfly eggs, larvae, or adults) to returning the enrolled property to the baseline conditions and identify the actions that would result in the return to baseline. As above, the Service or their designee may choose to relocate one or both affected covered species.

- *Notification of change of landowner.*

If a land transfer occurs that encompasses the enrolled lands, the Cooperator will provide the Service 60 days advance written notice. The new landowner will have the option to become a party to the terms and conditions set forth in this Agreement. Should the new landowner not wish to enter into the Agreement, the Service retains the opportunity to relocate affected covered species prior to the land transfer.

B. In consideration of the foregoing, the Service agrees to:

- *Compliance monitoring.*

The Service, or designees thereof, will be responsible for annual compliance monitoring relative to 1) visiting the enrolled lands during the Fender's blue butterfly flight period to determine if natural colonization has occurred and, 2) conducting annual site visits to ensure that the implementation of agreed-upon conservation measures has occurred.

- *Baseline determination.*

The Service has already made a baseline determination for the enrolled lands.

- *Complete restoration actions and provide technical assistance.*

The Service, or designees thereof, will complete agreed-upon oak savanna restoration measures and Kincaid's lupine establishment via the PFW Program. The Service will provide technical assistance and information on other Federal funding programs to the maximum extent practicable through the term of the Agreement.

- *Provide incidental take coverage.*

Upon execution of the Agreement and satisfaction of all other applicable legal requirements, the Service will issue a permit to the Cooperator in accordance with ESA section 10(a)(1)(A), authorizing take of the covered species as a result of lawful activities within the enrolled property.

7. AGREEMENT DURATION

The Agreement becomes effective upon the Service's issuance of the section 10(a)(1)(A) enhancement of survival permit (described previously). The Agreement will have a term of 15 years during which time the Cooperator will engage in specific conservation actions and will avoid engaging in activities which could result in mortality or reduced fitness of Kincaid's lupine or take of Fender's blue butterfly, should they colonize or be introduced to the site (per section 5 of this Agreement). The permit will have a term of 30 years, 15 years beyond the term of the Agreement. A longer permit term allows the Cooperator an extended period of time to determine when, if ever, they can choose to return the enrolled lands back to the original baseline.

This Agreement shall be binding on and shall insure to the benefit of the Parties and their respective successors and transferees, in accordance with applicable regulations (50 CFR 13.24 and 13.25). The rights and obligations under this Agreement shall run with the ownership of the enrolled property and are transferable to subsequent non-federal property owners pursuant to 50 CFR 13.25. The enhancement of survival permit issued to the Cooperator also will be extended to the new owner(s). As a party to the original agreement and permit, the new owner(s) will have the same rights and obligations with respect to the enrolled property as the original owner. The new owner(s) also will have the option of receiving Safe Harbor assurances by signing a new Agreement and receiving a new permit. The Cooperator shall notify the Service of any transfer of ownership as described in section 6. Assignment or transfer of the permit shall be governed by Service regulations in force at the time.

8. ASSURANCES TO THE COOPERATOR REGARDING TAKE OF COVERED SPECIES

After approval of the Agreement, the Service may not impose any new requirements or conditions on, or modify any existing requirements or conditions applicable to, a landowner or successor in interest to the landowner, to mitigate or compensate for changes in the conditions or circumstances of any species or ecosystem, natural community, or habitat covered by the Agreement except as stipulated in 50 CFR 17.22(c)(5) and 17.32(c)(5).

Provided that such take is consistent with maintaining or enhancing the baseline conditions identified in section 5 hereof, the section 10(a)(1)(A) permit referenced in section 6 shall authorize the Cooperator to take the covered species incidental to otherwise lawful activities in the following circumstances:

1. Under a previously signed PFW Landowner Agreement (Appendix 3), the Cooperator has agreed to avoid actions which could result in reduction of the oak savanna habitat quality for a 10-year time period, ending in 2011. Under the Safe Harbor Agreement, the Cooperator is authorized to make use of the enrolled property in any manner that does not reduce Kincaid's lupine populations for 15 years starting from the date that this Agreement is signed. Upon the expiration of the 15-year Agreement period, the Cooperator may reduce the Kincaid's lupine population and any Fender's blue butterfly individuals which may occur on the site back to the original baseline conditions of zero, provided that 60-day notification is provided to the Service. The permit will authorize take of species and their progeny, or alteration of occupied habitat, resulting from lawful activities within the enrolled lands, until permit expiration. The Cooperator may make any other lawful use of the property, even if such use results in the loss of individuals or their habitat covered under this Agreement.

2. Management activities described in this Agreement and authorized by the section 10(a)(1)(A) permit include loss due to crushing by mowing equipment, from prescribed burning, or other management activities.

The maximum number of individuals or occupied habitat that can be taken pursuant to this Agreement will be no more than the number of additional individuals or acres of occupied habitat above the baseline created through this Agreement. Thus, the net impact of the take authorized under this program is, at the very most, a return to the *status quo ante* or baseline. No habitat will be impacted until the Cooperator has given the Service a 60-day prior notice to relocate any remaining individuals from the area to be impacted, as deemed appropriate by the Service.

9. MODIFICATIONS

A. Modification of the Agreement. Any Party may propose modifications or amendments to this Agreement, as provided in 50 CFR 13.23, by providing written notice to, and obtaining the written concurrence of, the other Parties. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. The Parties will use their best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon the other Parties' written concurrence.

B. Termination of the Agreement. As provided for in section 12 of the Services Safe Harbor Policy (64 FR 32717), the Cooperator may terminate implementation of the Agreement's voluntary management actions prior to the Agreement's expiration date, for circumstances beyond the Cooperator's control. In such circumstances, the Cooperator may return the enrolled lands to baseline conditions even if the expected net conservation benefits have not been realized. If the Cooperator is unable to continue implementation of the plans and stipulations of the Agreement, whether due to catastrophic destruction of the species population numbers or habitat, or due to unforeseen hardship, the Cooperator would relinquish the permit to the Service. Species management on the Cooperator's lands would return to its status prior to the signing of the Agreement (i.e., original baseline). Such termination will not affect the Cooperator's authorization under the permit to take any species individual or occupied habitat that is not part of the Cooperator's baseline at the time of termination. The Cooperator may terminate this Agreement due to uncontrollable circumstances upon 60 days prior written notice to the other Parties, provided that the baseline conditions have been maintained and the Service is provided an opportunity to relocate affected species within 60 days of that notice. The Cooperator also may terminate the Agreement at any time for any other reason, but termination for reasons other than uncontrollable circumstances such as those associated with a *force majeure* (catastrophe) event shall extinguish the Cooperator's authority to take species or occupied habitat under the permit.

C. Permit Suspension or Revocation. The Service may suspend or revoke the permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation. The Service also, as a last resort, may revoke the permit if continuation of permitted activities would be detrimental to the maintenance or recovery of the covered species (50 CFR 13.28(a)). In such circumstances, the Service would exercise all possible measures to avoid revoking the permit.

D. Baseline Adjustment. The baseline conditions set forth in section 4 above may, by mutual agreement of the Parties, be adjusted if, during the term of the Agreements and for reasons beyond the control of the Cooperator, the utilization of the enrolled property by the covered species or the quantity or quality of habitat suitable for or occupied by the covered species is reduced from what it was at the time the Agreement was negotiated.

10. OTHER MEASURES

A. Remedies. Each Party shall have all remedies otherwise available to enforce the terms of the Agreement and the permit, except that no Party shall be liable in damages for any breach of this Agreement, any performance or failure to perform an obligation under this Agreement, or any other cause of action arising from this Agreement.

B. Dispute Resolution. The Parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all Parties.

C. Succession and Transfer. If the Cooperator transfers his or her interest in the enrolled property to a non-federal entity, the Service will regard the new owner as having the same rights and responsibilities with the respect to the enrolled property as the Cooperator, if the new property owner agrees and commits in writing to become a Party to this Agreement and the permit referenced in section 6.B. above, in place of the Cooperator.

D. Availability of Funds. Implementation of this Agreement is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

E. Relationship to Other Agreements. As described in this Agreement, the PFW Program funded the initial oak savanna restoration and Kincaid's lupine introduction in 2001 (Agreement #13420-1-J134).

F. No Third-Party Beneficiaries. This Agreement does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not a party to this Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the Parties to this Agreement with respect to third parties shall remain as imposed under existing law.

G. Other Listed Species, Candidate Species, and Species of Concern. Although the Service regards it as unlikely, the possibility exists that other listed, proposed, or candidate species, or species of concern may occur in the future on lands enrolled in the Agreement as a direct result of the Cooperators voluntary conservation actions specified in section 5 above. If that occurs and the Cooperator so requests, the Parties may agree to amend the Agreement and associated permit to cover additional species and establish appropriate baseline conditions for such other species.

H. Notices and Reports. Any notices and reports, including monitoring and annual reports, required by this Agreement shall be delivered to the persons listed below, as appropriate:

State Supervisor
Oregon Fish and Wildlife Office
U.S. Fish and Wildlife Service
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266

11. FUNDING

The PFW Program funded the initial oak savanna restoration and Kincaid's lupine introduction in 2001 (Agreement #13420-1-J134). Any actions for oak savanna vegetation maintenance and management taken by the Cooperator during the Agreement phase will be funded by the Cooperator or through State, Federal, or other wildlife programs that the Cooperator may choose to enroll in.

12. REFERENCES CITED

Alverson, E. R. 1990. A survey for native grassland remnants in the mid-Willamette Valley, Oregon. A report on research conducted with a grant from the Mazama's Research Assistance Program. Unpublished document.

Gilpin M. E. and M. E. Soule. 1986. Minimum viable populations: processes of species extinction. Pp. 19-34 *In* M. E. Soule (ed.), *Conservation Biology*. Sinauer, Sunderland, MA.

Hammond, P., and M.V. Wilson. 1993. Status of the Fender's blue butterfly. Report to the US Fish and Wildlife Service. 66 p.

Hitchcock, C.L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle, WA. 730 p.

Kuyendall, K. and T. Kaye. 1993. *Lupinus sulphureus ssp. Kincaidii*. Survey and reproductive studies. A cooperative project sponsored jointly by the US Dept. of the Interior, Bureau of Land Management Roseburg District, and Oregon Department of Agriculture.

Scott, J.A. 1986. *The Butterflies of North America: A Natural History and Field Guide*. Stanford University Press, Stanford, CA. 583 p.

US Fish and Wildlife Service. 2000. Endangered Status for *Erigeron decumbens var. decumbens* (Willamette Daisy) and Fender's Blue Butterfly (*Icaricia icarioides fenderi*) and Threatened Status for *Lupinus sulphureus ssp. kincaidi* (Kincaid's lupine). Federal Register 65:3875-3890.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement to be in effect as of the date that the Service issues the permit

Clemens Starck

Deputy Regional Director
U.S. Fish and Wildlife Service

APPENDICES

1. Species Status and Biology

Fender's blue butterfly was federally listed as endangered, and Kincaid's lupine as threatened, on January 25, 2000 (67 FR 3875). A critical habitat determination has not been made for either species. Much of the following information for these species was extracted from the Final Rule designating endangered and threatened status for these species, from an unpublished "Willamette Basin Overview" report from The Nature Conservancy to the U.S. Fish and Wildlife Service (2000), and from a summary of the most recent Oregon Natural Heritage Program database (ONHP 2002) and U.S. Fish and Wildlife Service database information.

Over 80 percent of the remaining upland prairies where these species are known to occur is threatened by agriculture and forest practices, development, grazing, and road construction and maintenance. Kincaid's lupine is the primary host food plant for Fender's blue caterpillars, and the two species are currently known to co-occur at 25 sites on approximately 279 acres across their ranges.

Historic Distribution and Habitat

Kincaid's lupine and Fenders blue are thought originally to have been widely distributed on upland prairie habitats throughout the Willamette Valley, with the lupine extending into the Umpqua Valley, Oregon. Early settlers to the Willamette Valley in the 1840's found a mosaic of open prairies, Oregon white oak or "Garry oak" (*Quercus garryana*) savannas, extensive Oregon ash (*Fraxinus latifolia*) and cottonwood (*Populus tricocarpus*) floodplain gallery forests, and red alder (*Alnus rubra*) and willow (*Salix* sp.) swamps (Boag 1992, Towle 1982, Johannessen *et al.* 1971, Thilenius 1968, Habeck 1961, Sprague and Hansen 1946).

Of the estimated 1,010,000 acres of native prairie that existed prior to 1850, approximately 685,000 acres or 67.8 percent consisted of upland prairie (Habeck 1961, TNC 1998). This extensive resource has been dramatically depleted since European settlement began in the 1840's through fire suppression, agricultural conversion, urbanization (Boag 1992), and the introduction of non-native vegetation (Franklin and Dyrness 1973). Current estimates of the remaining native upland prairie in the Willamette Valley are less than 988 acres (TNC 1998). This estimate represents only 0.1 percent of the original upland prairie once present.

Prairie has been lost due to fire suppression and subsequent woodland succession. Most Willamette Valley prairies are thought to be early seral habitats, requiring natural or human-induced disturbance, particularly fire, for their maintenance (Franklin and Dyrness 1973). Prior to European settlement, the native Kalapuya people are attributed with the maintenance of prairie habitats through prescribed burning (Boyd 1986). A serious long-term threat to all Willamette Valley prairie species is the change in community structure due to plant succession. Without active management, the natural succession of prairie to shrub/forest by the invasion of native species, such as Oregon ash, Douglas hawthorn (*Crataegus douglasii*), Nutka rose (*Rosa nutkana*) and Douglas's spiraea (*Spiraea douglasii*) alone would lead to the eventual loss of these prairie sites (Franklin and Dyrness 1973; Hammond and Wilson 1993; Johannessen *et al.* 1971; Kuykendall and Kaye 1993). The presence of invasive non-native woody species, such as Himalayan blackberry (*Rubus discolor*), multiflora rose (*Rosa multiflora*) and Scotch broom (*Cytisus scoparius*), exacerbate this problem. Shrub and tree intrusion has been documented on most of the relic prairie sites occupied by Kincaid's lupine and Fender's blue butterfly.

The presence of tall, fast-growing, non-native herbaceous species speeds the conversion of upland native prairie to dense, rank prairies and shrub lands. Invasion by non-native plant species has been documented at most Kincaid's lupine and Fender's blue butterfly sites (USFWS 2000). Non-native grass species aggressive enough to suppress native species include velvet grass (*Holcus lanatus*), orchard grass (*Dactylis glomerata*), false-brome (*Brachypodium sylvaticum*), tall oat-grass (*Arrhenatherum elatius*), tall fescue (*Festuca arundinacea*), and bent grass (*Agrostis tenuis*) (Hammond 1996).

Often fence rows, pastures, and intervening strips of land along agricultural fields and roadsides serve as the only remaining refugia for endemic upland prairie plants, which therefore occur in small and fragmented populations. Generally, the direct and indirect effects of small population size on most species of plants and animals include decreased dispersal ability, decreased rate of genetic exchange, a resultant loss of population viability and vigor, and a hastening towards extinction (Gilpin and Soule 1986).

Three large hilltop prairie areas remain despite development pressures on the Willamette Valley floor (Baskett Slough National Wildlife Refuge, Coburg Ridge, and McDonald State Forest). Two of these sites, Baskett Slough and Coburg Ridge, are being actively managed for populations of Kincaid's lupine and Fender's blue butterfly. These larger sites provide the greatest potential for long-term persistence of the species if their current condition can be sustained or improved. The importance of small populations lies in their potential to serve as stepping stones between larger, neighboring populations. The loss of small populations and remnant prairie habitats further isolates larger populations and limits opportunities for genetic exchange, migrations and/or re-colonization.

The modern use of herbicides for highway or roadway maintenance, farming practice, or other land uses for weed control and landscape maintenance purposes is further exacerbating the precarious survival of these remnant plant populations. Some of the remnant Kincaid's lupine populations occur within weedy sites and spraying nonspecific contact herbicides eliminates all existing plant species (Andy Robinson, pers. comm. 2003).

Current Status of the Species

Kincaid's lupine

Kincaid's lupine is a perennial forb generally associated with native fescue upland prairies that are characterized by heavier soils, with mesic to slightly xeric soil moisture levels. At the southern limit of its range, the subspecies occurs on well-developed soils adjacent to serpentine outcrops where the plant is often found under scattered oaks (Kuykendall and Kaye 1993). Kincaid's lupine is thought to have historically colonized areas along the edge of oak woodlands in upland prairies. Schultz (1997) theorizes that lupine patches were historically distributed no greater than 0.5 km (0.3 mi) apart, allowing dispersal of Fender's blue butterfly between lupine patches.

Kincaid's lupine is a long-lived perennial species with a maximum reported age of 25 years. Individual plants are capable of spreading by rhizomes, producing clumps of plants exceeding 20 m (33 ft) in diameter. Leaves are oval-palmate, with very narrow leaflets. The small, purplish-blue pea flowers grow in loose racemes that are 15.2-20.3 cm (6-8 in) tall. The flowering period has been reported from May to July (Eastman 1990) and from April to June (Hitchcock *et al.* 1961), but generally occurs during May and June. Self-incompatible, Kincaid's lupine must obtain pollen from another individual plant to produce fertile seeds and is therefore dependent on solitary bees and flies for pollination. Seed set and seed production are low, with few flowers

producing fruit from year to year and each fruit containing an average of 0.3 to 1.8 seeds. Seeds are dispersed from fruits that open explosively upon drying.

Kincaid's lupine occurs in 97 remnant upland prairie patches, averaging 1.454 km² (0.561 mi²) in size, scattered from Lewis County, Washington to Douglas County, Oregon. Within the Willamette Valley, Kincaid's lupine occupies 86 habitat patches averaging 1.395 km² (0.539 mi²) in size. In the Umpqua Valley, Douglas County, Oregon, Kincaid's lupine occupies eight small patches, averaging 0.057 km² (0.022 mi²) in size, and in Lewis County, Washington, three tiny patches, averaging 0.002 km² (0.0008 mi²) in size.

Fender's blue butterfly

Distribution

Fender's blue butterfly is a Willamette Valley endemic subspecies that was considered to be extinct until rediscovered by Dr. Paul Hammond in 1989 in McDonald State Forest, Benton County, Oregon. The historical distribution of Fender's blue butterfly is not precisely known, due to the limited information collected on this species prior to its description in 1931. Recent surveys have determined that Fender's blue butterfly is confined to 33 habitat patches in Yamhill, Polk, Benton, and Lane counties in Oregon. One population at Willow Creek TNC preserve in Eugene, Lane County, Oregon is found in wet *Deschampsia*-type prairie, while the remaining sites are generally found on drier upland prairies characterized by fescue species. The Willow Creek aggregate of populations is the largest of the south valley sites.

Habitat

Fender's blue butterfly is known to use Kincaid's lupine as its primary larval food plant but is also known to use spur lupine (*Lupinus laxiflorus* = *L. arbustus*) and sickle-keeled lupine (*L. albicaulis*) as secondary host plants. Female Fender's blue butterflies lay their eggs on lupine foliage in late May or early June and larvae emerge to feed on foliage during late June. In July, larvae crawl to the base of the plant and enter diapause. From this point until the larvae emerge and begin feeding on foliage again the following April, the larvae remain at the base of the senescent plant, or in the litter immediately adjacent to the lupine stem. Fender's density has been positively correlated with the number of Kincaid's lupine flowering racemes, and more recently, to nectar production in native flowering species used as nectar sources by Fender's. Survivorship of larvae to adult butterflies has been estimated at 0.025-0.060 percent (Schultz, unpublished data, cited in Schultz and Crone 1998).

Recent research (Schultz and Dlugosh in litt. 1999) indicates that native wildflowers in the Willamette Valley prairies provide more nectar than nonnative flowers for adult butterflies, and that Fender's blue butterfly population density is positively correlated with the density of native wildflowers. In Lane County, key native flowers include: wild onion, (*Allium amplexans*), cat's ear mariposa lily (*Calachortus tolmiei*), common camas (*Camassia quamash*), Oregon sunshine (*Eriophyllum lanatum*), and rose checkermallow (*Sidalcea virgata*) (Schultz and Dlugosh in litt. 1999). Tall oatgrass (*Arrhenatherum elatius*) and other non-native grasses can out-compete these native forb species (Hammond 1996). The abundance of exotic grasses can effectively preclude butterflies from using a Kincaid's lupine patch (Hammond 1996).

Connectivity

Anecdotal evidence indicates that under ideal conditions adult Fender's blue butterflies may disperse as far as 5-6 km (3.1 to 3.7 mi) from their natal lupine patches (Hammond and Wilson 1992, Schultz 1994). According to Schultz (1997), adult dispersal of this magnitude is not likely anymore. Schultz (1997) found that the butterflies are generally found within 10 m (32.8 ft) of

lupine patches, although they might disperse more than 2 km (1.2 mi) between lupine patches. Hammond (1998) reports recolonization of a site by Fender's blue butterfly from a distance of approximately 3 km (1.9 mi). Schultz (1997) further theorizes that Fender's blue originally would have had a high probability of dispersing between patches, which were historically located an average of 0.5 km (0.3 mi) apart. Current distribution of lupine patches range well beyond this distance, and barriers to migration between close sites may be present.

Today, remnant upland prairie acreage is extremely fragmented and remaining Fender's blue butterfly populations are so small that migration processes are not expected to maintain the population over time. Extirpation of remaining small populations is expected from localized events and low genetic diversity of very small populations. The low availability of host lupine patches and fragmentation of habitat are seen today as the major ecological factors limiting reproduction, dispersal, and subsequent colonization of new habitat (Hammond 1994, Hammond and Wilson 1992, 1993, Schultz 1997, Schultz and Dugosch 1999).

Population size

Censuses of Fender's blue butterfly were started in 1991; most of the 22 census units have been surveyed every year since 1993 (Fitzpatrick and Schultz 2001, Hammond 1994, 1996, 1998, 2001, Hammond and Wilson 1993, Schultz 1994-1998).

Total range-wide population numbers (once most sites were monitored) of Fender's blues have ranged from a low of 1,384 in 1998 to a high in 2000 of 3,492. Although population size appears to have increased between 1998 and 2000, this could be a result of poor weather conditions in 1998, and thus poor flight conditions, and it could also be an artifact of increasing survey effort at these sites. However, some of this increase may be attributed to habitat enhancement activities such as tree and shrub removal from lupine sites.

2. Net Conservation Benefit

The biological goal of the conservation measures set forth in this Agreement is to provide a net conservation benefit to Kincaid's lupine and the Fender's blue butterfly. By eliminating competition from invasive plant species, setting back succession, restoring native savanna vegetation, and introducing Kincaid's lupine onto this site, we hope to improve Kincaid's lupine propagation and outplanting technology which will bolster the current lupine population and enhance the species persistence into the future. Active management for Kincaid's lupine will directly and indirectly impact Fender's blue butterfly, as well as other prairie-dependent butterflies such as the field crescent (*Phyciodes pratensis*) and Anise swallowtail (*Papilio zelicaon*).

Techniques to establish Kincaid's lupine are still evolving, thus, the Service estimates that it may take as many as four introduction events spanning 2 to 4 years (starting in 2003 through 2005) for the establishment of a sustainable population. Approximately 200-300 potted plants of Kincaid's lupine and a minimum of 500 Kincaid's lupine seeds will be introduced into selected areas of the 20-acre savanna restoration (Appendix 4). The introduced population may be used as a source for further translocations, including for augmentation of the donor population, other genetically compatible Kincaid's lupine populations, or for the establishment of new populations within appropriate demes within the historic range. Any such recovery actions will be done in accordance with USFWS recovery guidelines (in development).

To achieve a net conservation benefit for Kincaid's lupine, methods of invasive plant species control will be continually refined in order to meet the changing landscape. As invasive species are reduced, Kincaid's lupine should respond positively, producing larger plants and larger colonies within the savanna. Increased Kincaid's lupine populations may result in natural colonization by Fender's blue butterfly over time, providing that concurrent habitat management actions occur at nearby population centers. These benefits will also achieve a net conservation benefit for Fender's blue butterfly, beyond the potential for natural colonization, by providing a potential site for introduction of Fender's blue butterfly, and by increasing knowledge of successful habitat management techniques which will be applicable to the management of existing Fender's blue butterfly sites.

The cooperator agrees to voluntarily manage the enrolled lands to produce a cumulative net conservation benefit to the covered species by implementing conservation measures to increase native habitat quality. The net conservation benefit will contribute, directly or indirectly, to recovery of the covered species, after taking into account the length of the Agreement and any off-setting adverse effects of authorized take. Although the Agreement may not permanently conserve or recover species populations or their habitats, it provides for important short-term benefits to the species, including but not limited to the following: restoring habitat; increasing the body of knowledge on Willamette Valley oak savanna habitat enhancement; increasing the body of knowledge on Kincaid's lupine propagation and outplanting techniques; increasing Kincaid's lupine distribution; increasing savanna habitat connectivity; insuring against catastrophic events; and, creating areas for testing and implementing new conservation strategies.

The Parties anticipate this Agreement will result in an increased distribution of the covered species within the enrolled lands. Without this cooperative effort, these lands would not otherwise be utilized by the species in the foreseeable future. The Agreement is a mutually beneficial relationship between a government agency and a private landowner to benefit endangered and threatened species. Therefore, the cumulative impact of this Agreement and the

activities it covers, which are facilitated by the authorized take, will provide a net conservation benefit to the species.

3. Partner's for Fish and Wildlife Agreement

LANDOWNER AGREEMENT FOR RESTORATION PROJECTS UNDER THE OREGON PARTNERS FOR WILDLIFE PROGRAM

THIS AGREEMENT, made and entered into this 23rd day of May , 2001, by and between Barbara and Clem Starck (16075 Guthrie Rd, Dallas, OR 97388); hereinafter called Owners, for themselves, executors, administrators, successors, and assigns; and the U.S. Fish and Wildlife Service (2600 S.E. 98th Avenue, Suite 100, Portland, OR 97266), hereinafter called the Service.

The Service enters into this Agreement pursuant to and in accordance with section 1 of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended; 16 U.S.C. 661 *et seq.*) and section 7 of the Fish and Wildlife Act of 1956, 16 U.S.C. 742f(a)(4).

The signatories to this Agreement will work in partnership with the Service and other cooperators to accomplish specific restoration activities for the benefit of fish and wildlife resources on their property in the Fern Creek Watershed in Polk County, Oregon. The parties have a common interest in improving the current condition and/or expanding the extent of habitat on their lands, which are located in Sec13, T8S, R6W, Willamette Meridian. This Agreement provides for the limited interchange of services, equipment, and funds to meet the objectives of the project. A project description, which includes the specific work to be completed, is attached hereto and incorporated herein as Project Work Plan/Dallas Oak Restoration.

The terms of this agreement will be for 10 years beginning July 1, 2001, and ending July 1, 2011. During this 10-year period, the Owners agree not to intentionally compromise the integrity of the restoration work and site. The Owners also agree to:

- (1) provide reasonable property access to Service and cooperating agency/organization personnel to plan, complete, and monitor the long-term condition of the project site. Notice shall be given to Owner(s) or designated agent(s) prior to entering the site;
- (2) obtain any Federal, State, and local permits, if required, for the project; and
- (3) insure that no project activities begin until notification has been received from the Service Project Manager that all applicable Federal, State, and local regulations have been met and all necessary permits have been issued.

This agreement may be modified at any time by mutual written consent by authorized representatives of all the parties. Any party may seek termination of this agreement by providing notice in writing to the other parties that it desires the agreement to be terminated. Such termination shall be effective thirty (30) days after authorized representatives of all parties have agreed in writing to such termination. If termination is initiated by the Owner(s), the Service will be reimbursed for the portion of the costs of the restoration project provided by the Service.

This agreement does not authorize the Service to assume any ownership interest in or jurisdiction over said premises. The Owners retain all rights to control trespass and retains all responsibility for taxes, assessments, and damage claims.

Each of the parties to this agreement agrees that it will be liable for its own acts and the acts of its employees, agents, representatives, subsidiaries, or affiliates, and the results thereof, in connection with the performance of its obligations under this agreement, and for its own acts and the acts of its employees, agents, representatives, subsidiaries, or affiliates, and the results thereof, that occur on the land, unless such acts or results arise from the negligent or willful acts, or omissions of the other parties to this agreement, their employees, agents, representatives, subsidiaries, or affiliates.

A change in ownership shall not change the terms of this agreement. The agreement and terms shall be in effect on the described land for the period of the agreement unless the agreement is terminated earlier in accordance with the provisions contained herein. The Owners will notify the Service of changes in ownership within thirty (30) days. In the event of such transfer of ownership, the Owners shall provide a copy of this agreement to the succeeding owner prior to such transfer.

Upon expiration or termination of this agreement, the Owners assumes full and complete responsibility for all restoration developments made under this agreement. Barbara and Clem Starck guarantee ownership of the above-described land and warrant that there are no outstanding rights which interfere with this agreement.

IN WITNESS THEREOF, the parties have executed this Agreement on the day, month, and year last indicated:

Landowners:

By: _____
(Signature)

Date: _____

(Signature)

U.S. Fish and Wildlife Service:

By: _____
(Signature)

Date: _____

Title: _____

4. Kincaid's lupine introduction plan

Propagation and Reintroduction of Kincaid's Lupine: Starck Savanna

PFW 13420-01-J134

Cooperator:
Northwest Habitat Institute

Sub-Contractor:
Institute for Applied Ecology

Total project cost: **\$7,500**

Products: Collect seed, prepare/germinate seed and propagate seedlings to plant a minimum of 200-300 potted plants of Kincaid's lupine and a minimum of 500 Kincaid's lupine seeds in areas of the 20 acre savanna restoration site mutually agreed upon by FWS and contractor(s) in a field meeting on October 1, 2002.

Planting will occur in a minimum of four separate phases over at least two years;

Phase 1 seed planting will occur in November/December of 2002.
Phase 2 potted seedling planting will occur in March/April of 2003.
Phase 3 seed planting will occur in November/December of 2003.
Phase 4 potted seedling planting will occur in March/April of 2004.

Plants will be marked, monitored, weeded/watered throughout two entire growing seasons following planting.

Additional plantings in winter of 2004 and spring of 2005 may be required if minimum number of plants has not yet been achieved. FWS must be notified if a Phase 3 is needed and the contract will be extended as needed.

Report dates:

Phase 1 and 2 summary report will be provided to FWS (and Cooperator) by September 30, 2003
Phase 3 and 4 summary report will be provided to FWS (and Cooperator) by September 30, 2004

A final report will be provided to FWS (and Cooperator) by September 30, 2005.

Report will include the following information: number of seeds collected per collection event, dates and sites collected from, percent germination, percent survival, # seedlings outplanted to project area, percent survival through out two growing seasons following outplanting, percent flowering after one year, percent flowering after two years, percent flowering after three years (if applicable).

5. Service-Approved management protocol for occupied Fender's blue butterfly sites, December 2002 (replace with most current accepted protocol, as developed).

Habitat Maintenance and Restoration

These activities consist largely of various means of invasive species removal, as follows:

A. Manual – Upland prairie fragments with Fender's blue butterflies and Kincaid's lupines generally require routine treatment to remove woody vegetation and invasive exotic plants, such as Himalayan blackberry (*Rubus armeniacus*) and Scotch broom (*Cytisus scoparius*) to maintain the condition of their remaining native plant community.

Manual maintenance is typically accomplished by hand pulling weeds and using lopping shears and weed pullers. These activities may be implemented year round, however, when possible the work will be conducted between mid-August and February. In many areas, use of mechanical mowers and line trimmers (described below) may be more appropriate, e.g. to control dense stands of tall fescue (*Festuca arundinacea*).

B. Mechanical– Mechanical maintenance activities, occurring in occupied habitat, will mostly be conducted when the lupine and nectar plants have completed seed production and the butterflies are in diapause, i.e. mid- August through February (unless otherwise specified). These techniques include: mowing, line trimming, grubbing, girdling trees, and chain saw removal of woody species.

When mowing, no more than 75 percent of the occupied habitat, at any given site, will be mowed. Untreated strips of occupied habitat, approximately 12 meters (m) wide, will be evenly distributed throughout the mowed portions of a site. The center of a mowed area will be within 100 (m) of untreated occupied habitat, which can serve as a recolonization source. Mowers will be set to a height so that blades gouge no more than five percent of the ground.

Early spring mowing (March through May 15) may be used for management purposes in unoccupied habitat only. No more than 33 percent of the Kincaid's lupine, on any given site, will be impacted. The mowers will be set to a height of 10 centimeters (cm) to 15 cm, in order to reduce harm to low-stature native plants and minimize gouging of the ground. Line trimmers provide more precision than mowers and may be used in occupied habitat in early spring when necessary. Care will be taken to avoid injuring low-stature native plants and Fender's larvae with the line trimmers.

C. Prescribed fire – In the fall (i.e. September through November), prescribed burns may be performed to discourage woody plant growth, remove accumulated leaf litter and duff, and encourage the spread of native prairie grasses and forbs. The annual burn unit (ABU) will be determined based on the individual site conditions and population sizes.

The ABU for sites supporting 100 or more adult Fender's blue butterflies may be a maximum of 33 percent of the occupied habitat. The ABU for sites with less than 100 adult Fender's may be a maximum of 25 percent of the occupied habitat. The center of the ABU will be within 100 m of unburned occupied habitat, which can serve as a recolonization source. Once burned, a unit will not be re-burned for at least three years, to allow butterfly populations to rebuild. The use of fire for habitat maintenance inherently increases the risk of accidentally impacting more habitat than

originally intended. In order to ensure the maximum allowable ABU will not be exceeded, Cooperators will plan to burn approximately five percent less than the annual maximum.

In order to reduce the potential fuel load, the removal of large woody plants will occur prior to burning, when feasible. Ignition of burn areas will be by hand, using propane, fusees, or drip torches. Fire control/suppression will be accomplished with the use of pre-burn hose lays, wet-lining, or fire retardant foam. Prescribed burns will be conducted in a manner consistent with state and local smoke management regulations. Vehicles would not be operated in the areas of listed species. Additionally, where patch size allows, butterfly refugia within burn units will be protected with a fire break and/or watering down prior to a burn.

When using controlled fire as a management technique, additional consideration of subsequent annual treatments for the ABU will be necessary. The year following a burn, management of that unit will be limited to manual techniques and herbicide applications. Additionally, during a burn year, management activities will also be limited for adjacent units of the site. Mowing will not occur on a site that is scheduled to be burned, in order to limit the maximum affected area to approximately 33 percent of the site.

Future research efforts may include studies on Fender's blue butterfly individuals, in order to assess the potential for reintroducing the species to historic sites that no longer support a viable population. For instance, to determine if captive rearing is a possibility for Fender's blue butterfly, studies will need to be conducted on Fender's individuals. Therefore, occupied habitat that is scheduled to be burned may be used as a source for collecting Fender's blue butterfly eggs and larvae, when an appropriate holding/rearing facility is available.

D. Herbicide Use – In some locations, the control of exotic species, through manual removal, mowing, or prescribed burning may not be feasible and the use of herbicides may be most appropriate. Therefore, this consultation will also address issuance of permits covering use of the herbicides with the following active ingredients: glyphosate, sulfmeturon methyl, and triclopyr, with Entry II used as a surfactant. Herbicides shall be applied using spot-treatment in the least intrusive manner possible, after lupine and nectar plants have senesced (Mid-August).

E. Solarization: Solarization is the removal of monotypic weed patches by tilling, then covering an area of less than 1500 square meters (m²) with plastic during the growing season. Elevated temperatures kill most of the target species. Follow-up with hand weeding may be necessary. Treated areas are typically seeded with native species. Solarization will only be implemented in unoccupied habitat.

F. Infrared Radiation: Infrared radiation is another thermal control weed management technique. Covered infrared radiators are passed over sites proposed for prairie restoration that no longer support Fender's or Kincaid's lupine. The high temperature damages the cellular structure and mostly kills weeds in early life stages (typically within several hours or few days.) First signs of the effectiveness are change of leaf color and plant withering. Treated areas are typically seeded with native species.

G. Establishing Native Vegetation– Native plants may be seeded or planted post-treatment to both encourage establishment of native vegetation within a project site and to discourage potential spread and establishment of exotic and invasive species. For instance, native nectar plants, such as rose checkermallow (*Sidalcea virgata*), in existing Fender's habitat where native nectar plants are depauperate may be essential for successful habitat restoration (Alverson 2001). Additionally, most of the current Fender's sites are isolated from one another and in order to "connect" these

habitats for Fender's dispersal, habitat patches will need to be reestablished. This will involve many of the exotic removal treatments previously described, followed by the planting of native species, including Kincaid's lupine. This work will be conducted in late spring or late winter, while the butterflies remain in diapause, and at some distance from extant Kincaid's lupine plants, where the inactive larvae may be present.

Collection of Kincaid's Lupine Seed and Plant Material

Various scientific research efforts may require the collection of some leaves, flowers, and immature seeds from Kincaid's lupine plants found on private lands. This type of research may be essential in identifying new management techniques and understanding existing habitat conditions. No more than five percent of the available seed, leaves and flowers, will be collected from any given site, and no plants will be killed.

Figure A. General Location of Dallas Oak Savanna in Polk County, Oregon.

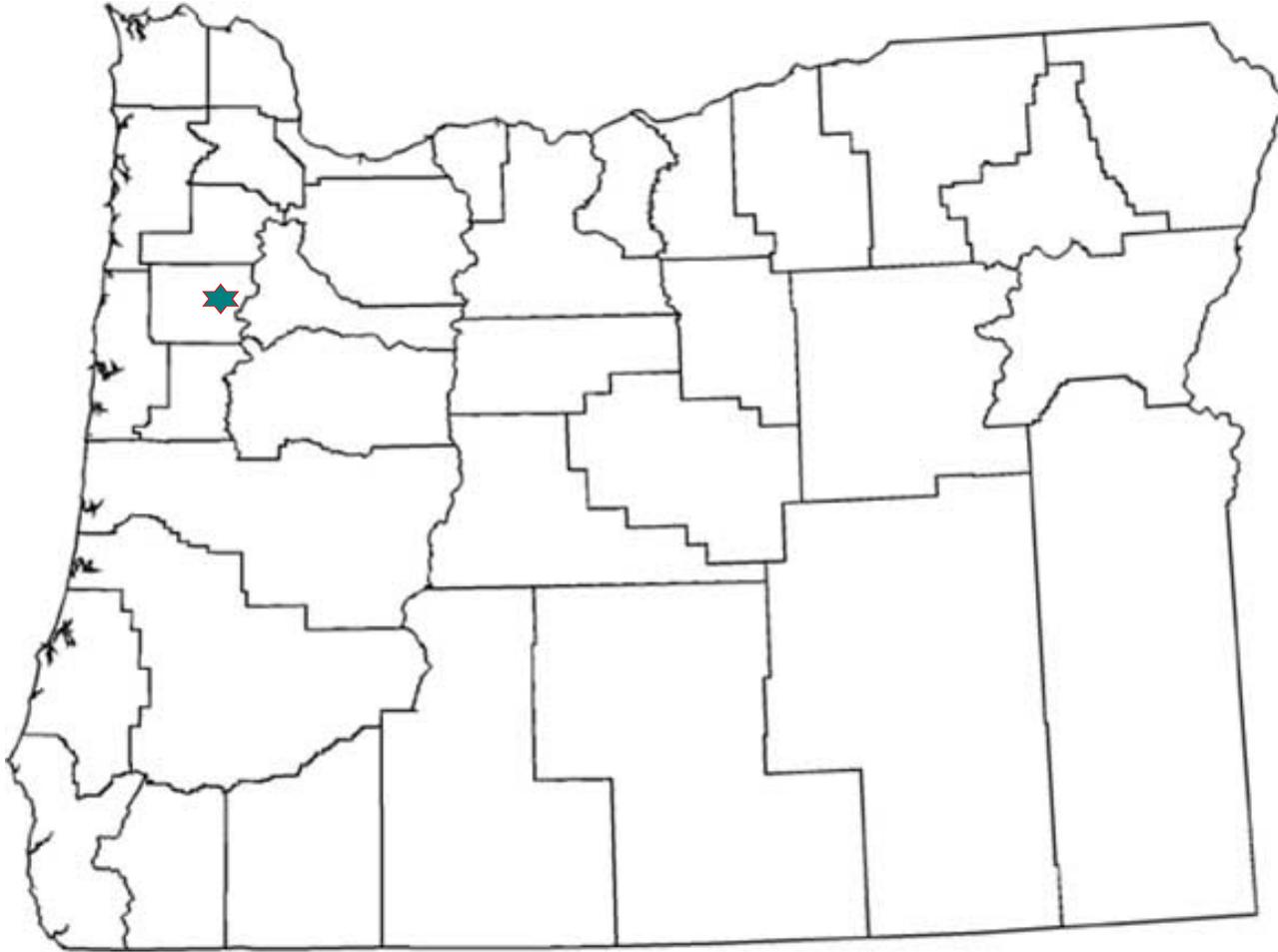


Figure B. Dallas Oak Savanna site photo with marked locations of areas comprising the safe harbor enrolled lands.

