LIP Progress Report 2

Krautmann Jefferson Farm Oak and Prairie Habitat Restoration Project

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Time period covered by report: February 1st 2007 – January 31st 2008

Administrative Summary:

The goal of this restoration project is to restore and enhance 135 acres of critically imperiled native Willamette Valley oak and prairie habitat. This project will benefit both at-risk animal species such acorn woodpecker, Lewis' woodpecker, western meadowlark, and Fender's blue butterfly, and at-risk plant species such as Willamette Valley larkspur, Kincaid's lupine, Willamette daisy, Bradshaw's lomatium, and Nelson's checkermallow. A key objective of this project is to establish large, genetically diverse populations of native plants, including threatened and endangered species.

Project objectives and narrative describing project accomplishments during this report period:

Objective 1: Control invasive and non-native plants in the project area.

Task 1.1: Use a combination of broadcast-sprayed herbicides, spot-sprayed herbicides, sheering, mowing, hand-cutting, and other appropriate techniques to reduce and control invasive and non-native grasses, forbs, shrubs, and trees in the project area.

Rationale: Non-native plants out-compete native plants, and thus need to be removed to facilitate the survival of native plants.

Products: A reduction in non-native grasses, forbs, shrubs, and trees on the 135-acre site.

Schedule: Spring 2006 – Spring 2011

Accomplishments: 50 acres of historic savanna habitat sown with native grasses in fall of 2006 were treated with broadleaf herbicide spring – fall of 2007. 30 of those acres were "clean" enough to seed with native forbs in the fall. Thistles were spot-sprayed on 30 acres in the spring. 10 acres east of the savanna hill were treated with glyphosate in preparation for native grass and forb seed fall of 2008. 8 acres of dense oak woodland with patches of English hawthorn, blackberry, and poison oak were treated mechanically. 15 acres of grassland with large areas of blackberry were re-mowed in the summer of 2007. See **Appendix A** for photos.

Objective 2: Convert young oak woodland to oak savanna.

Task 2.1: Thin areas of young, skinny oaks to a density of approximately 2-5 trees per acre. Retain trees with lower branches.

Rationale: Oaks grown in low densities typically exhibit broad crowns and large lower branches. These oaks harbor lichens that are a source of protein for animals, produce copious amounts of acorns, and provide numerous microhabitats that support invertebrates and birds.

Products: 2-5 oaks per acre on approximately 50 acres.

Schedule: Summer 2006 - Fall 2009

Accomplishments: 8 acres of dense young oaks were treated mechanically during the summer to return that area to savanna conditions and open up the understory for the addition of native seed and plugs. See **Appendix A** for photos.

Task 2.2: Establish native grasses and forbs in the newly formed oak savanna.

Rationale: Establishing native grasses and forbs will increase botanical diversity in the oak savanna and enhance its value for wildlife.

Products: An increase in native grasses and forbs on approximately 50 acres of newly formed oak savanna.

Schedule: Fall 2006 - Fall 2011

Accomplishments: Bare areas in the 8 acres cleared of young oak and brush in the summer of 2007 were overseeded with native forbs species in the fall. 20 acres of remnant native grassland and areas with low vegetation cover after the 2006/2007 thinning were planted with mature plugs and/or bulbs of 11 species of native forbs in the spring and fall of 2007. See **Appendix A** for photos and **Table 1** for the list of native plugs.

Objective 3: Improve mature oak woodland habitat.

Task 3.1: Thin mature oak woodland.

Rationale: Thinning the mature oak woodlands will result in healthier, fuller-crowned oaks. Thinning will also allow the persistence of native prairie forbs in the woodland understory.

Products: 50-100 trees per acre on approximately 30 acres of mature oak woodland.

Schedule: Summer 2007 – Summer 2009

Accomplishments: Trees and brush that could be thinned or mowed mechanically with a skid-steer were removed in 2006 (see 2007 annual report). No other action was taken in 2007. Hand-thinning is scheduled to occur in 2008 or 2009.

Task 3.2: Place avian nest boxes in the oak woodland.

Rationale: Avian nest boxes will provide supplementary cavities for oak woodland-nesting birds.

Products: Placement of approximately 5 nest boxes in the oak woodland.

Schedule: Winter 2005/2006

Accomplishments: Completed as scheduled (see 2007 annual report)

Task 3.3: Mow oak woodland understory to reduce thatch and encourage growth of native plants.

Rationale: Many native plant species do not thrive if there is a build-up of thatch.

Products: A reduction in thatch on 30 acres of mature oak woodland.

Schedule: Fall 2007 – Fall 2009

Accomplishments: Done in 2006, and planned for 2008

Objective 4: Increase habitat for wildlife that utilize snags and brush piles.

Task 4.1: Limb and top conifer trees throughout the project area. Leave some trees only partially limbed to provide replacement snags.

Rationale: Many bird species utilize snags for foraging and nesting. Limbing and topping conifers produces longer standing snags than girdling. It is important to leave replacement snags (partially limbed trees) for future habitat after the older snags fall.

Products: Creation of approximately 60 snags and 15 replacement snags.

Schedule: Summer 2006, 2007, 2008

Accomplishments: Conifers were snagged in 2006 (see annual report). No other conifers were available to snag in 2007. More snags are planned in 2008 and 2009 as new areas of dense tree and brush are treated.

Task 4.2: Create several wood piles on the edges of fields and roads using debris produced by Tasks 1.1, 2.1, and 4.1.

Rationale: Leaving the woody debris where it falls would not allow for subsequent prescribed burns. Building piles out of some of the debris will provide food and nesting sites and create cover for a variety of wildlife species.

Products: Wood piles constructed for wildlife cover.

Schedule: Summer 2006 - Fall 2009

Accomplishments: Some brush piles from 2006 were not burned during the winter of 2007 to provide habitat. No piles from the 2007 tree and brush work were burned so some may remain when burned in late-fall of 2008. See **Appendix A** for photos.

Objective 5: Reintroduce native plants on pre-existing savanna (i.e., savanna that is not a product of Objective 2).

Task 5.1: Establish native prairie grasses and forbs on the savanna.

Rationale: Establishing native grasses and forbs will increase botanical diversity in the oak savanna and enhance its value for wildlife.

Products: Successful establishment of at least 5 native upland grasses and at least 45 native upland forbs on 55 acres of established oak savanna.

Schedule: Fall 2006 – Fall 2009

Accomplishments: 30 acres of the historic savanna hill previously sown with native grasses were seeded with two different native forb seed mixes fall 2007 (23 species total). A broadcast method was chosen due to the high density of the grasses and to ensure all the soil in between the grass rows would have native seed applied (drilling would not accomplish this). The *Danthonia californica* section had more room for forbs due to the extra window of site preparation before the grass germinated in the spring so a mix of slower growing perennials and less aggressive annual species were sown. The section with the fall-germinating bunchgrass mix had less room for forbs due to the presence of weedy grasses and more residual broadleaf weeds so more competitive native forbs were chosen for the mix. Small areas in the *Danthonia* section with very low to no grasses present were sown with native forbs species that are very slow to establish and/or very little seed was available. These were trial areas to see if some of these species can be established from seed rather than reintroduced as plugs. See **Appendix A** for photos and **Tables 2 and 3** below for forb species sown.

Task 5.2: Plant native shrubs in savanna ravines**.**

Rationale: Many of the ravine areas are thick with undesirable shrub species. These shrubs will be removed in accordance with Objective 1. Because shrub habitat is used by numerous animal species for food, nesting, and cover, desirable shrub species will be re-planted in the ravines.

Products: 2-5 acres of improved native shrub cover.

Schedule: Fall 2009

Accomplishments: Ravine areas were treated with broadleaf herbicide in preparation for latter planting

Objective 6: Reintroduce threatened, endangered, and other federal-status plant species to the project site.

Task 6.1: Obtain a National Fish and Wildlife Foundation Native Plant Conservation Initiative Grant or similar grant to help fund the propagation of federal-status plant species.

Rationale: Additional funding is needed to propagate approximately 31,000 plant plugs from seeds previously collected under federal permits issued to the grantee.

Products: A National Fish and Wildlife Foundation Native Plant Conservation Initiative Grant or similar grant

Schedule: 2006 – 2007

Accomplishments: An OWEB small grant was obtained in spring of 2006 for the propagation and planting of 8,900 federal-status plant plugs from January of 2007 to spring of 2008. A National Fish and Wildlife Foundation grant was obtained fall of 2006 for the propagation and planting of 11,500 federal-status plugs from January 2007 to the fall of 2009.

Task 6.2: Propagate and plant plugs of 5-8 federal-status plant species.

Rationale: In order to ensure good establishment of large numbers of some plant species, it is prudent to plant them as plugs.

Products: Production and successful reintroduction of approximately 31,000 plugs of 5-8 federal status plant species.

Schedule: Spring 2007 – Fall 2011

Accomplishments: 5,500 plugs of *Erigeron decumbens* (Willamette daisy), 3,000 plugs of *Horkelia congesta* (Shaggy horkelia), and 3,000 plugs of *Sidalcea nelsoniana* (Nelson's checkermallow) were propagated winter-fall of 2007. The plugs were planted with the help of student volunteers and Heritage Seedlings employees in November of 2007. The Willamette daisy and Shaggy horkelia were planted on the historic savanna hill (these are upland species) and Nelson's checkermallow was planted in the wet prairie just east of the Lake. Seed of *Delphinium oreganum* (Willamette Valley larkspur) and *Lomatium bradshawii* (Bradshaw's lomatium) are in production for planting in fall of 2008 (need two year old plants).

Objective 7: Create a Geographic Information System (GIS) for the project.

Task 7.1: Create a project GIS and use it to analyze and understand changes in the property's vegetation types over time.

Rationale: Mapping and monitoring spatial relationships will aid in an understanding of project-caused increases and decreases in vegetation types over time.

Products: A project GIS with maps that depict changes in vegetation cover as a result of restoration and management activities in the project area.

Schedule: Winter 2006/2007 - Fall 2011

Accomplishments: Wildlife researchers from Oregon Wildlife Institute are using Jefferson Farm as a prototype/demonstration site to design a protocol for monitoring bird response to restoration activities. It was their opinion the site was too small to use GIS to map vegetation changes over time. A vegetation unit map was prepared by the project coordinator using general survey and air photo data and included in the 2007 annual report. This was used as a starting point for the bird monitoring research.

The researchers are using a systematic variable-plot design to estimate bird densities using distance-based sampling and to evaluate vegetation conditions, including plant species composition, percent cover, and vegetation structure. These data will be collected overtime and will be mapped.

Objective 8: Conduct project education and outreach.

Task 8.1: Work with local schools to get young people involved in hands-on activities at the project site.

Rationale: Long-term maintenance of oak and prairie habitats is the responsibility of future generations. Therefore, all opportunities should be taken to instill in young people an understanding of restoration and a desire to be stewards of the lands of the Willamette Valley in a thoughtful and appreciative way.

Products: Student involvement in restoration activities such as planting efforts, botanical monitoring, and bird surveys. Annual reports will detail information such as the activities in which students were involved, which school(s) participated in the activities, the number of students that participated, when the activities occurred, and what products were produced by the activities.

Schedule: Spring 2006 – Fall 2011

Accomplishments: 44 students from 9 local schools (Middle and High schools) participated in the planting of federal-status plant species in November of 2007. The students were part of the OSU Extension Service “YES!” program which focuses on environmental learning projects. The project coordinator provided background material on oak savanna habitat and the species they were planting prior to the planting date.

Task 8.2: Conduct annual project site tours for natural resource agencies, non-profits, and private landowners.

Rationale: Site tours help to promote a better understanding of the need

to restore native habitats and allow information sharing about various restoration methods.

Products: At least one site tour will be conducted each year. The grantee will compile attendee names, affiliations, contact information, and reasons for interest.

Schedule: Fall 2006 - Fall 2017

Accomplishments: In April of 2007, the project coordinator was asked to give a tour of Jefferson Farm as part of a Small Acreage Landowner Conservation Stewardship Workshop sponsored by the North and South Santiam Watershed Councils. A document was provided to the landowners outlining the importance of oak savanna habitat, general restoration costs per task, and information specific to the efforts occurring at Jefferson Farm. Since the workshop was through another organization, no names are included in this report but there were at least 20+ landowners present for the tour.

In September 2007, the American Forest Foundation requested the use of the Jefferson Farm restoration project as a backdrop for a Forested Flyways Conservation Forestry Field Day for Landowners. There were over 50 landowners present and restoration professionals from the Willamette Valley spoke on: "Techniques Used for Oak Woodland and Savanna Restoration (Steve Smith – USFW); Oak Savanna Understory Restoration (Jonathan Sol – TNC); Wildlife and Oak Ecosystem Restoration (Peg Boulay, ODFW); Managing Oak Woodlands and Savannas for Multiple Benefits (Brad Withrow-Robinson, OSU Extension Service); and Custom Sawmilling for Oregon White Oak (Frank Pender, Tanglewood Timber Products). The project coordinator for Jefferson Farm gave a brief introduction about the restoration efforts occurring and was available to answer questions during the various presentations. Since the workshop was through another organization, no names are included in this report. See **Appendix A** for photos

Objective 9: Conduct project monitoring.

Task 9.1: Conduct annual post-planting botanical surveys.

Rationale: Regular monitoring will assess seedling establishment, success of each planting method tried, persistence of native plant populations, and invasive plant threats. This information will help the grantee determine the need for project maintenance actions such as augmentation with additional native plants, increased weed control efforts, and prescribed burns.

Products: Annual botanical monitoring reports.

Schedule: Summer 2007 – Summer 2017

Accomplishments: The native grasses seeded in the fall of 2006 on the savanna hill established well in most places (see **Task 5.1**). The area was treated with a broadleaf herbicide during the 2007 field season. Fall surveys determined that this herbicide is ineffective in killing St. John's wort and only makes poison oak and Himalayan

blackberry mad. At least 20 acres were determined to be too infested with these invasive species to seed with forbs last fall. A stronger broadleaf herbicide, Crossbow®, was sprayed over the entire hill in hopes it would be more effective. The area will be resurveyed in spring of 2008 to determine if this is the most appropriate herbicide to use. This area will only be seeded when the invasive species are under control.

Areas in the thinned oak woodland areas (those defined in **Objective 2**) that were seeded with native grasses and forbs in the fall of 2006 were surveyed during the spring and summer of 2007. The lower parts of the ravines must have had a lot of residual seed and the natives sown did not establish well – although the nurse crop of oats was very dense. The steep slope area and areas that had had a dense overstory of trees or blackberry prior to thinning seemed to have less residual seed and the establishment of the natives seeded was better. A second season survey will better determine how effective broadcast and hydroseeding methods are in areas where existing vegetation is not removed by herbicide. The natives seeded in the mature woodland did not come up due to the heavy residual seed layer of the invasive species shining cranesbill. See **Appendix A** for photos

Task 9.2: Conduct avian point counts at 15-25 locations 3 times during the breeding season each year for at least 5 years.

Rationale: These surveys will help track changes in avian species composition over time.

Products: A map of point count locations and annual point-count lists.

Schedule: Spring 2006 – Spring 2010

Accomplishments: Data still being compiled at time of report

Objective 10: Conduct project maintenance.

Task 10.1: Augment native plantings and continue or enhance weed control efforts as needed to ensure restoration success.

Rationale: Maintenance efforts are required to ensure the long-term success of restoration efforts.

Products: Site maintenance.

Schedule: Fall 2008 - Fall 2017

Accomplishments: Scheduled to start 2008

Task 10.2: Establish burn units in the pre-existing and newly formed oak savannas and initiate a 3-5 year burn rotation.

Rationale: Burning discourages woody vegetation growth, reduces thatch, and stimulates the root crowns of many of the native species, thereby encouraging rigorous growth of the natives. Burn studies have shown, however, that a frequent burn rotation encourages non-native annual

plants. Burning every 3-5 years will help favor the herbaceous perennial species on the site.

Products: Approximately 100 acres of oak savanna burned every 3-5 years. Annual botanical surveys will record native species abundance and invasive species control within the context of when fire occurred (year 1, year 2, year 3 after burn, etc.).

Schedule: Fall 2008 - Fall 2017

Accomplishments: Scheduled to start 2008

Table 1 (**Task 2.2**) Native plugs planted spring and fall 2007 in areas thinned in 2006 and 2007

Species	**Common**
Asclepias speciosa	Showy milkweed
Balsamorhiza deltoidea	Mules ear/ California compass plant
Camassia leichtlinii	Leichtlin's camas
Dichelostemma congestum	Ookow
Geranium oreganum	Oregon geranium
Lomatium dissectum	Fern-leaved lomatium/Biscuit root
Perideridia oregana	Oregon yampah
Triteleia hyacinthina	Hyacinth brodiaea
Viola adunca	Early blue violet
Viola praemorsa	Prairie violet
Wyethia angustifolia	Deltoid balsamroot

Table 2A – Native forbs sown on savanna hill fall 2007
Danthonia californica section

Species	**Common**
Achillea millefolium	Western yarrow
Aquilegia formosa	Western columbine
Clarkia amoena	Farewell to spring
Clarkia rhomboidea	Diamond clarkia
Collinsia grandiflora	Large-flowered blue-eyed Mary
Gilia capitata	Blue field gilia
Ligusticum apiifolium	Licorice root
Lomatium dissectum	Fern-leaved lomatium/biscuit root
Lomatium nudicaule	Bare-stem lomatium/biscuit root
Lomatium utriculatum	Spring gold
Lupinus polycarpus (micranthus)	Small-flowered lupine
Perideridia oregana	Yampah
Plectritis congesta	Rosy plectritis
Potentilla glandulosa	Sticky cinquefoil

Potentilla gracilis	Slender cinquefoil
Ranunculus occidentalis	Western buttercup
Sidalcea campestris	Meadow checkerbloom

Table 2B - Native grass mix section

Species	**Common**
Achillea millefolium	Western yarrow
Clarkia purpurea ssp. *quadrivulnera*	Purple godetia
Collomia grandiflora	Large-flowered collomia
Eriophyllum lanatum	Oregon sunshine
Gilia capitata	Blue field gilia
Ligusticum apiifolium	Licorice root
Lomatium nudicaule	Bare-stem lomatium/biscuit root
Lotus unifoliolatus	Spanish clover
Potentilla glandulosa	Sticky cinquefoil
Potentilla gracilis	Slender cinquefoil
Prunella vulgaris var. *lanceolata*	Self-heal
Sanguisorba occidentalis	Western burnet

Table 3 – Native forbs sown in small plots in *Danthonia californica* section

Species	**Common**
Camassia leichtlinii	Leichtlin's camas
Dichelostemma congestum	Ookow
Triteleia hyacinthina	Hyacinth brodiaea
Lomatium dissectum (Jefferson Farm accession)	Fern-leaved lomatium/biscuit root
Viola adunca	Early blue violet
Viola praemorsa	Prairie violet
Silene hookeri	Hooker's silene
Carex tumulicola	Foothill sedge
Luzula comosa	Woodrush
Erigeron decumbens (T&E species)	Willamette daisy
Horkelia congesta (T&E species)	Shaggy horkelia
Sanicula bipinnatifida	Purple sanicle
Vicia americana	American vetch
Lotus micranthus	Small-flowered deervetch

Appendix A – Photos for 2008 Interim LIP Report

Task 1.1

	
Savanna hill section seeded with *Danthonia californica* fall 06 treated with glyphosate February 07 before germination in March	Savanna hill - broadleaf weeds in *Danthonia* section to be treated with broadleaf herbicide early summer 07
	
Savanna hill - Canadian thistle patch	Canadian thistle post broadleaf herbicide
	
Eastern knoll dense brush pre-mow	Eastern knoll dense brush post-mow

	
Eastern knoll with dense oak pre-thin **Task 2.1**	Eastern knoll with dense oak post-thin; native plugs & bulbs planted fall 07
	
Balsamorhiza deltoidea – one of 8 native forb species planted as plugs the eastern knoll thinned summer 07 **Task 2.2**	*Viola adunca* – planted in area thinned in 2006 and 2007
	
Brush pile produced in 2006 that will remain for habitat **Task 4.2**	Some brush pile produced in 2007 will be moved to edge of road in 2008 to provide habitat **Task 4.2**

	
Native grass mix section March 2007 **Task 5.1**	Native grass mix section January 2008
	
Danthonia californica section March 2007 **Task 5.1**	*Danthonia californica* section January 2008
	
Horkelia congesta plugs ready for planting fall 2007 **Task 6.2**	*Erigeron decumbens* plugs ready for planting fall 2007 **Task 6.2**

	
Sidalcea nelsoniana plugs ready for planting **Task 6.2**	Dedicated YES! student volunteers gear up for a wet day of planting T&E plants **Task 6.2**
	
Project coordinator discusses fine art of planting plugs in wet gooey soil **Task 6.2**	Hands-on educational experience – gettin' "down and dirty" for the environment **Task 6.2**
	
Steve Smith, USFW, shows off some of the restoration power tools at the Forested Flyways landowner workshop **Task 8.2**	Steve shows participants the aftermath of the CAT skid-steer work to reestablish savanna conditions at Jefferson Farm. **Task 8.2**

	
Peg Boulay, ODFW, explains the value of the large, open growth oak structure for wildlife habitat. **Task 8.2**	Jonathan Sol, TNC, explains the challenges of reestablishing native vegetation after ground disturbing restoration activities. **Task 8.2**
	
Newly established *Clarkia* (March 07) in bare slope area hydroseeded in fall 2006 **Task 9.1**	Newly established buttercup and yarrow (March 07) **Task 9.1**
	
Nurse crop of oats added to natives in Hydroseed mix established well **Task 9.1**	Shining cranesbill is the new scourge of woodland understories **Task 9.1**