

West Eugene Wetlands Mitigation Bank

2011 Annual Report



April 2012

This report was prepared by the Parks and Open Space Division
of the City of Eugene's Public Works Department



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Chapter 1. Introduction

Background

The West Eugene Wetland Mitigation Bank Program operates under an agreement between the Oregon Department of State Lands, Oregon Department of Environmental Quality, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and the City of Eugene. The Memorandum of Agreement (MOA) establishing the Bank was signed in 1995.

This is the sixteenth annual report required as a condition of the MOA that established the West Eugene Wetland Mitigation Bank (Bank). This annual report serves two primary purposes:

1. To fulfill the technical reporting requirements identified in the MOA.
2. To provide a broader view of the Bank's operations and accomplishments for a general audience who view the Bank as a model project in Oregon and the United States.

Organization of this report

This report is organized into two main parts with an introduction:

Chapter 1: Introduction. This chapter provides an overview of the mitigation bank program and this annual report.

Part 1: Financial and Planning Information

Chapter 2: Credit and Financial Summary. This chapter describes the financial status of the Bank and lists any planned capital improvement projects. Information on credit sales, credit generation, Bank expenditures, and a financial reconciliation are included.

Part 2: Site reports

Chapter 3: Introduction to Site Reports. This chapter contains an overview of the information contained in the site reports.

Chapter 4: Site report. This chapter includes information on the active individual mitigation bank site including: background, design goals, management actions from the previous year, recommended actions for 2012, and the monitoring reports.

Appendices:

A - Monitoring Methods. This section is a description of the methods used to collect data for the monitoring reports.

B – Plant Species List for all active Mitigation Bank Sites. The plant species observed on each site are recorded by noting the section of the restoration or enhancement area in which they were found.

A brief overview of wetland regulation and planning

Wetlands are regulated by a combination of Federal, State, and local agencies. At the Federal level, wetlands are regulated by U.S. Army Corps of Engineers under the Clean Water Act and the Rivers and Harbors Act, as well as by the U.S. Natural Resources Conservation Service under the federal Farm Bill. At the State level, wetlands are regulated by the Oregon Department of State Lands under the State Removal-Fill Law. At the local level, wetlands are also regulated by the West Eugene Wetlands Plan, Oregon's first Wetland Conservation Plan. The West Eugene Wetlands Plan (Plan) was originally adopted by the Eugene City Council and the Lane County Board of Commissioners in 1992, and then amended in 2000 and 2002. The Plan is a multiple objectives planning document that provides a vision for wetland protection while accommodating development. The Plan policies call for creation of a mitigation bank to help fund restoration and enhancement. The West Eugene Wetlands Mitigation Bank was created to meet this need.

Mitigation bank program

Why a mitigation bank? The advantage of a mitigation bank is that mitigation actions are planned within the context of the wetland system where the most suitable sites are identified, acquired, and restored in advance of wetland impact. This strategy is preferred to other alternatives that usually result in incremental and ecologically disconnected attempts at mitigation.

Why a public mitigation bank? The advantage of a public mitigation bank is that the functions and values that the wetland resource may provide are accessible to the community. Although use may be restricted, it is not prohibited. The public is able to utilize opportunities for recreation, research and education. The lands of the West Eugene Wetlands Program comprise the largest component of the open space system within the City's Urban Growth Boundary. Furthermore, the bank is managed by the City, which is held accountable by the community that it represents.

What is the West Eugene Wetland Mitigation Bank? The West Eugene Wetland Mitigation Bank program includes wetland restoration and enhancement on a number of suitable sites and the certification and sale of mitigation credits to applicants required to provide compensation for adverse impacts to wetland resources. Restoration sites are located within a connected system of existing wetlands that are managed by the West Eugene Wetlands Partnership. The Bank orchestrates the process of mitigation by providing compensatory mitigation in advance of approved impacts to wetlands. The Bank is a key instrument envisioned in the Plan to achieve three major objectives: (1) to lead in the implementation of plans to restore and enhance wetland communities, (2) to provide certified compensatory mitigation credits to businesses and public agencies that seek to impact wetlands located

within the Bank's service area, and (3) to provide an alternative to meet mitigation needs in a timely and economic manner

What are credits? A credit is a unit of measure representing the accrual or attainment of wetland functions at a mitigation bank. The unit of measure of function is typically indexed to the number of wetland acres that are restored, created, enhanced, or preserved. A "certified credit" results when the mitigation bank has met or exceeded the performance standards established in the Bank MOA. Once credits are certified, they are available for sale or exchange.

For more information on mitigation banks in Oregon, visit the Oregon Department of State Lands Wetlands Program web site.

http://www.oregonstatelands.us/DSL/PERMITS/mitbank_intro.shtml

Who are the players? The City of Eugene is the Bank sponsor. Staff from the City of Eugene's Parks and Open Space Division's Natural Resources Section manage Bank operations. The Bureau of Land Management (BLM) and The Nature Conservancy (TNC), as partners in the West Eugene Wetlands Program and as a cosigner to the Bank MOA (in the case of the BLM), collaborate through the sharing of technical assistance.

State and federal agencies form a committee, the Interagency Review Team (IRT), which oversees the Bank's operations. It is the responsibility of the IRT to review and approve plans for wetland restoration and enhancement, to monitor Bank operations for compliance, and to provide technical assistance in Bank management when requested. The IRT consists of representatives of three federal agencies (the U.S. Environmental Protection Agency, the Army Corps of Engineers, and the U.S. Fish & Wildlife Service) and two state agencies (the Oregon Division of State Lands and the Oregon Department of Environmental Quality).

Where can West Eugene Wetland Mitigation Bank projects occur? Bank mitigation projects take place within the Long Tom River watershed, of which Amazon Creek is a tributary. Figure 1.1 shows the geographic area within which the mitigation bank operates. This area was originally identified on Map 2 of the West Eugene Wetlands Plan as the "Western Amazon Drainage Basin", and in Appendix C (Map 1) of the MOA that established the Bank. Credits may be made available to projects outside of this area with approval by the Oregon Department of Environmental Quality and U.S. Army Corps of Engineers.

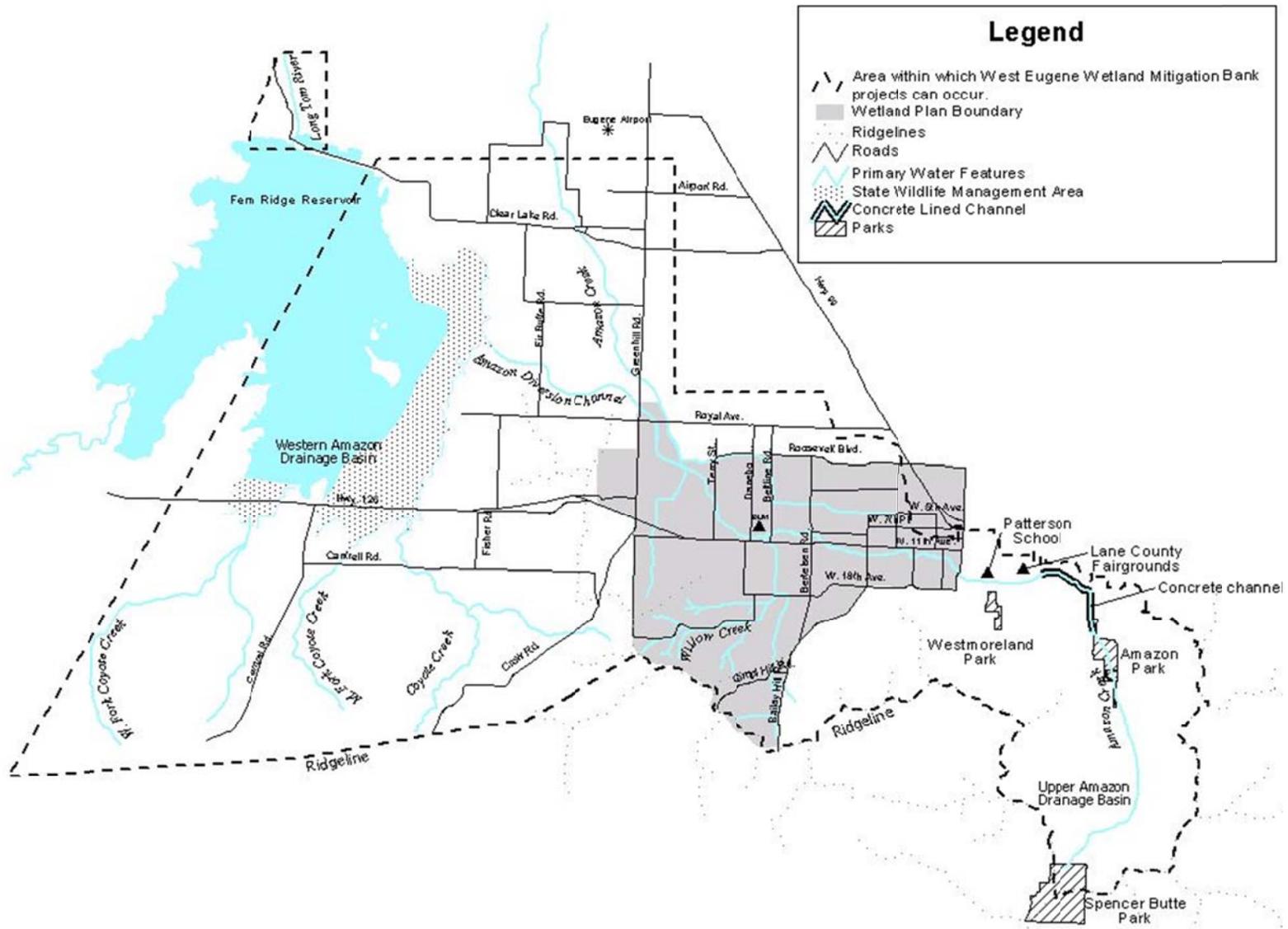


Figure 1.1. Area within which West Eugene Wetland Mitigation Bank projects can occur.

Chapter 2. Credit and Financial Summary and Future Capital Improvements

Financial information for the 2011 calendar year is provided in this chapter, as are any capital improvement projects planned for future enhancement phases. Included is:

1. Information regarding mitigation credit sales during 2011.
2. A list of annual Bank credit sales from 1994 – 2011.
3. A summary of Bank revenues and expenses.
4. A list of any planned capital improvement projects.

Credit sales during 2011

Bank Ledger Summary

At the beginning of the calendar year, the Bank had a credit ledger balance of 17.55 credits. During 2011, no additional credits were certified for sale. A total of 0.15 previously certified credits were removed from our credit inventory due to an enhancement project to establish a 0.3 acre forested ash swale at Dragonfly Bend that was not fully implemented. The Bank sold a total of 0.18 mitigation credits in 2011, leaving an end-of-year balance of 17.22 credits.

Credit Fee Adjustments

In January 2011 the price of mitigation credits was adjusted upward 1.1 % through an Administrative Order. The price increased from \$58,000.00 to \$58,630.00 per mitigation credit. The Administrative Order requires an automatic annual adjustment to credit pricing that tracks inflation using the U.S. Consumer Price Index-Urban (CPI-U) inflation index. The Administrative Order also provides for a discounted rate of 15% for single credit purchases in excess of 10 credits (“bulk sales”) when the Bank has a cash balance sufficient to fund 1.5 years of anticipated operating expenses.

Please refer to Table 2.1 below, for a summary of the Bank’s credit sales for 2011.

Table 2.1 Summary of credit sales and deductions during 2011.

| | Purchase Date | Credits in Transaction | Balance |
|--|---------------|------------------------|--------------|
| Credit balance on January 1, 2011 | | | 17.55 |
| Credits requested for certification during year | | 0.00 | 17.55 |
| Credit adjustment - Dragonfly Bend Phase 2 | | (0.15) | 17.40 |
| | | | |
| Credits sold in 2011 | | | |
| Oregon Department of Transportation | 04/11/2011 | (0.18) | 17.22 |
| Subtotal of credits sold in 2011 | | (0.18) | |
| Credit balance as of December 31, 2011 | | | 17.22 |

Annual Bank credit sales from 1994 - 2011

Since its first credit sale in 1994, the West Eugene Wetland Mitigation Bank has sold a total of 110.27 compensatory mitigation credits. See Table 2.2 for an annual break-down of credit sales.

Table 2.2. Summary of Annual Credit Sales, 1994 – 2011

| Calendar Year | Total Credits Sold |
|----------------------|---------------------------|
| 1994 | 7.29 |
| 1995 | 1.50 |
| 1996 | 2.71 |
| 1997 | 15.03 |
| 1998 | 9.55 |
| 1999 | 7.85 |
| 2000 | 5.09 |
| 2001 | 7.40 |
| 2002 | 7.73 |
| 2003 | 3.10 |
| 2004 | 12.19 |
| 2005 | 2.20 |
| 2006 | 4.06 |
| 2007 | 4.03 |
| 2008 | 14.11 |
| 2009 | 2.05 |
| 2010 | 4.20 |
| 2011 | 0.18 |
| Total | 110.27 |

**Financial Summary For Both
West Eugene Wetland Mitigation Bank and Coyote Prairie North Mitigation Bank**

Table 2.3 summarizes the financial activity during 2011 for both City managed mitigation banks, the West Eugene Wetlands Mitigation Bank and the Coyote Prairie North Mitigation Bank. The Banks started the calendar year with a cash balance of \$653,407.37. Revenue from credit sales and other sources of income totaled \$19,606.40. Operations and maintenance costs totaled \$129,372.11, while capital costs totaled \$13,542.60. The end of year cash balance was \$530,099.06 (Table 2.3).

Table 2.3. Financial Summary for 2011.

| Description of Item | Transaction Amt. | Balance |
|---|-------------------|-------------------|
| Cash Balance - January 1, 2011 | | 653,407.37 |
| Revenue | | |
| Credits Sold (.18) at \$58,630 per credit | 10,553.40 | |
| Heitzman Farm Lease Income | 3,990.00 | |
| Interest Income | 5,063.00 | |
| Subtotal of Revenues | 19,606.40 | |
| | | 673,013.77 |
| Operations and Maintenance Costs | | |
| WMB/OM Payroll and Miscellaneous Operational Expenses | 129,372.11 | |
| Subtotal of Operations and Maintenance Costs | 129,372.11 | |
| | | 543,641.66 |
| Capital Costs | | |
| WMB-Coyote Prairie NE Phase | 13,542.60 | |
| Subtotal of Capital Costs | 13,542.60 | |
| | | 530,099.06 |
| Cash balance - December 31, 2011 | | 530,099.06 |

Capitol Improvement Projects

No new mitigation bank capital improvement projects are anticipated to be implemented under the existing MOA at this time. In 2011, a new bank instrument was established, and all new credits generated will be administered under this new instrument. A new Capital Improvement Plan was developed through this process and appears in the 2009-2011 Report for the Coyote Prairie North Mitigation Bank.

Chapter 3. Introduction to Site Reports

Monitoring reports have been prepared for all active West Eugene Wetlands Mitigation Bank sites. The reports are found in the following section (Part 2: Chapter 4). During 2011, there was one mitigation site with two phases within the monitoring program of the West Eugene Wetlands Mitigation Bank. Bank sites are monitored for a period of 5 years or until the site meets mitigation bank success criteria. During the monitoring period, a variety of assessments are made at each site.

The monitoring data provided are used to assess the mitigation project's success in achieving the performance criteria and the overall performance of the mitigation. Qualitative assessments are made on a quarterly or annual basis and seek to document site hydrology, non-native vegetative cover, and wildlife use. Quantitative vegetation assessments occur in years 2 and 5. The data are analyzed to determine if the mitigation site is meeting the performance criteria established in the MIP. In addition, both qualitative and quantitative data are used to help guide the maintenance activities recommended for each site. The methods used in the collection of all data are discussed in detail in Appendix A.

The outline of each site report is given below. The reports begin with a description of the site, its history, and management goals. This section also includes a site map or maps of each phase. A summary of the site's progress toward meeting mitigation bank performance criteria follows. The current year's management and maintenance actions, along with recommendations for future management actions, are also included. The final section summarizes the data collection and analysis that took place in the current year.

I. Site Name

A. Site Description

1. *Size*
2. *Ownership*
3. *Site Timeline*
4. *Location*
5. *Site History*
6. *Focus of Prescriptions*
7. *Site-Specific Management Goals*
8. *Site Map*

B. 2011 Monitoring and Management Summary

1. *2011 Management Actions*
2. *Management Actions for 2012*

C. Monitoring Methods and Results

1. *Hydrology*
 - a) *Methods*
 - b) *Results*
2. *Vegetation*
 - a) *Methods*
 - b) *Results*
3. *Wildlife Utilization* (if wildlife specifically noted)

Chapter 4. Coyote Prairie Unit

A. Site Description

Total Site Area: 240.4 acres

Ownership: City of Eugene

Site Timeline:

Table 4.1. Coyote Prairie Unit Site Timeline.

| Section | Year of Construction | Total Restored/Enhanced Acres within Mitigation Bank Phases | Creditable Enhancement Acres | Monitoring Period |
|---|---|---|------------------------------|-------------------|
| Phase 1 Prairie Enhancement | 2006 | 26 | 23.5 | 2007-2011 |
| Phase 2 Prairie Enhancement | 2007 | 37.8 | 37.8 | 2008-2012 |
| Phase 2 Rare Plant Enhancement | 2007 | 1.5 | 0 | 2008-2012 |
| NE Phase (formerly 'Phase 3') Prairie Enhancement | Within Coyote Prairie North Mitigation Bank | 84.0 | (see CP North bank report) | N/A |
| Future NW Phase | Within Coyote Prairie North Mitigation Bank | 81.0 | (see CP North bank report) | N/A |

Location

The Coyote Prairie Unit is located in the Coyote Creek drainage approximately 1.5 miles west of Eugene. The site lies on the south side of Cantrell Road and is bisected by the east branch of Coyote Creek.

Site History

The site has likely been in agricultural use since the late 1800s or early 1900s, initially as pasture, and then cropped for hay and grass seed production beginning in the early 1970s.

Focus of Prescriptions

The principal goal of enhancement activities at Coyote Prairie is to re-establish a mosaic of wet prairie, upland prairie, emergent wetlands, and vernal pool habitats that likely existed across the site prior to agricultural conversion. An approximately 1.5 acre section of the site, located in the extreme northeast, appears to have never been in rye grass production. Consequently, a small population of *Lomatium bradshawii* persists in the area, along with many other native

forb and grass species. The focus of prescriptions in this area is to remove invasive pasture grasses, invasive forbs, and encroaching woody vegetation.

Site-Specific Management Goals

1. Re-establish a mosaic of emergent, vernal pool, wet prairie and upland prairie vegetation types.
2. Enhance forest habitat where it currently exists.
3. Enhance remnant wet prairie for the *Lomatium bradshawii* population by removing encroaching woody vegetation and invasive species.
4. Enhance habitat conditions to be more suitable for native wildlife species associated with a wet/upland prairie system such as western meadowlark, short-eared owl, northern harrier, savanna sparrow, camas pocket gopher, Roosevelt elk, garter snake, and long-toed salamander.

B. 2011 Monitoring and Management Summary

In 2011, Phase 1 was in its fifth growing season and, based on the 2011 monitoring, has now met its vegetation and hydrologic performance criteria. Wet Prairie, emergent, and upland plant community establishment in Phase 1 has been robust, diverse, and overwhelmingly native. From 86 – 90% of total plant cover is native. Wetland hydrology exists throughout those areas mapped as wetland. The focus of management in 2011 in this phase was continued control of small occurrences of nonnatives such as *Hypochaeris radicata*, *Mentha pulegium*, *Hypericum perforatum*, and *Rumex acetosella*. Having met its success criteria, this site will be considered an inactive mitigation bank site and will continue to be managed by City of Eugene Parks and Open Space staff.

Phase 2 is on track to meet its fifth-year vegetation and hydrology standards, based on second-year quantitative monitoring in 2009 and continued management actions. The Phase 2 native perennial grasses seeded in 2009 and 2010 became more robust in 2011. Management in Phase 2 focused on controlling or eliminating populations of *Hypochaeris radicata*, *Mentha pulegium*, *Hypericum perforatum*, *Lythrum hyssopifolia*, *Senecio jacobina*, *Dipsacus fullonum*, *Rumex conglomerata*, and *Rumex crispus*. Monitoring of the Phase 2 remnant prairie *Lomatium bradshawii* population continues annually. In spring 2011, staff recorded 30 *Lomatium bradshawii* plants, an increase from the previous year, likely due to staff removing thatch and tall vegetation in fall 2010 to reduce sheltering areas for voles.

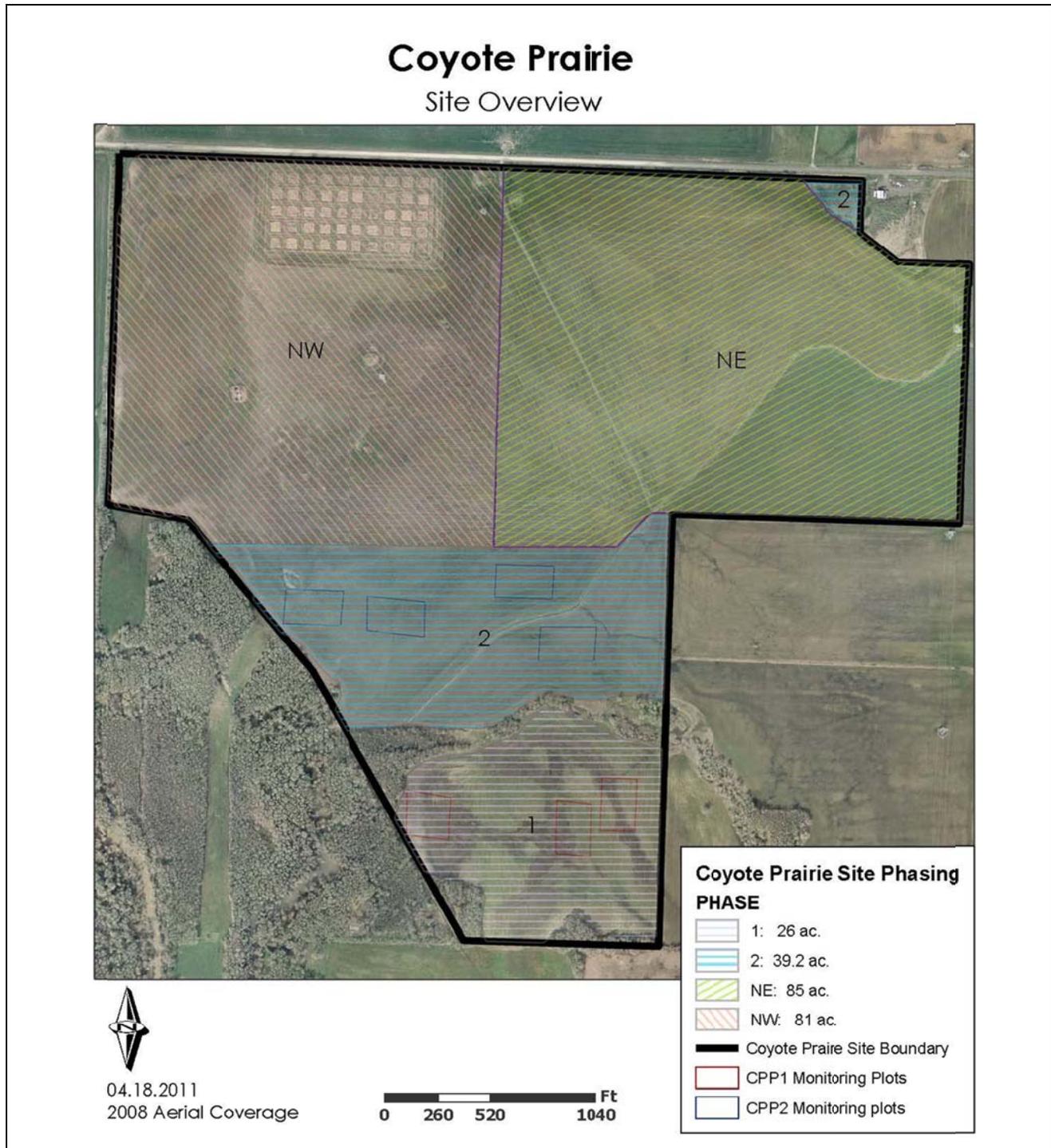


Figure 4.1. Coyote Prairie Enhancement Phasing Site Map. The enhancement phases of Coyote Prairie are labeled with their approximate acreage. Note that phases 1 and 2 are part of the West Eugene Wetlands Mitigation Bank and Phases NE and NW (formerly Phases 3 and 4) are in the Coyote Prairie North Mitigation Bank.

Coyote Prairie Phase 1

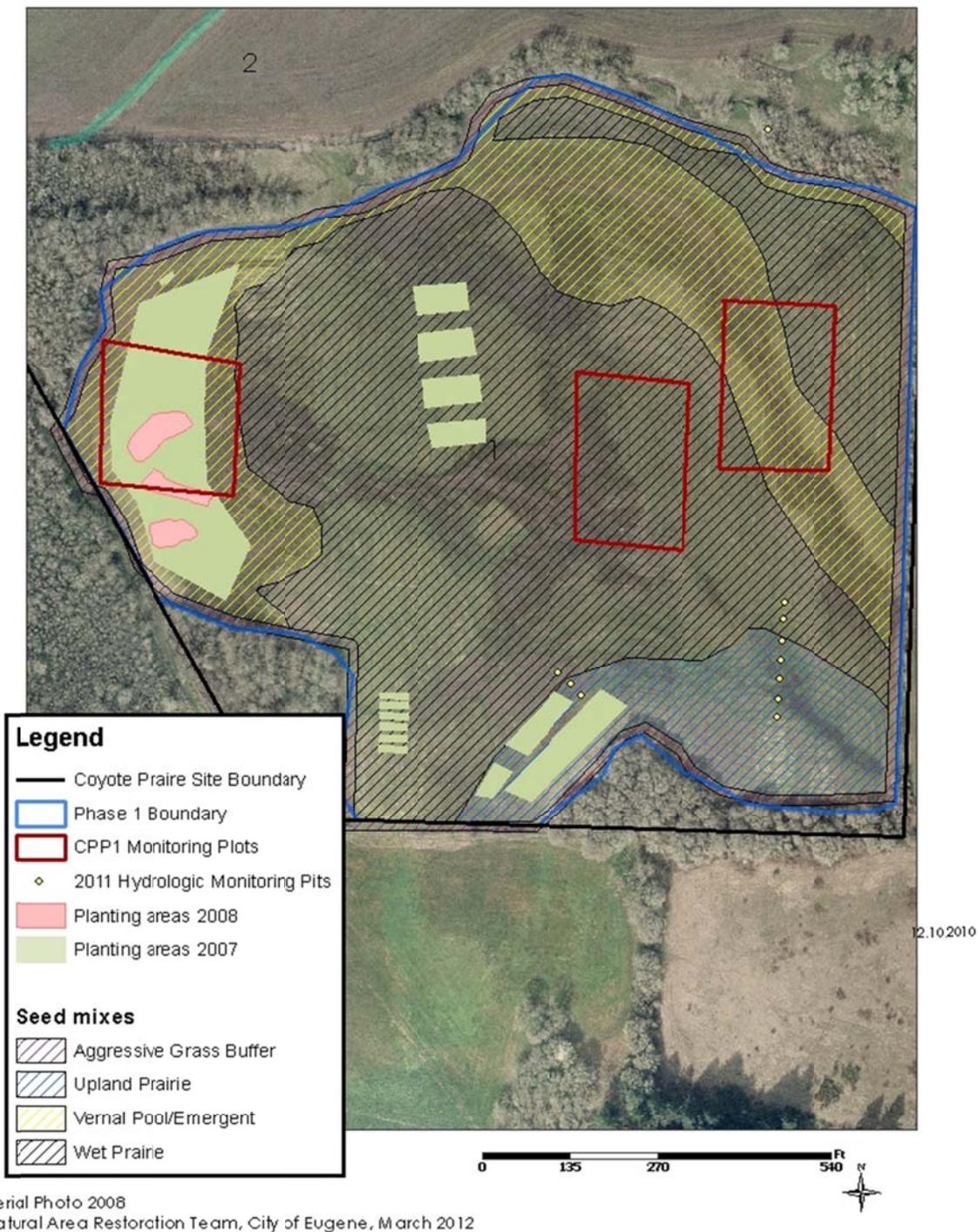


Figure 4.2. Coyote Prairie Phase 1 Project Map and Planting Plan. Included are seed mixes, seedling planting areas, and monitoring locations for Phase 1 of Coyote Prairie.

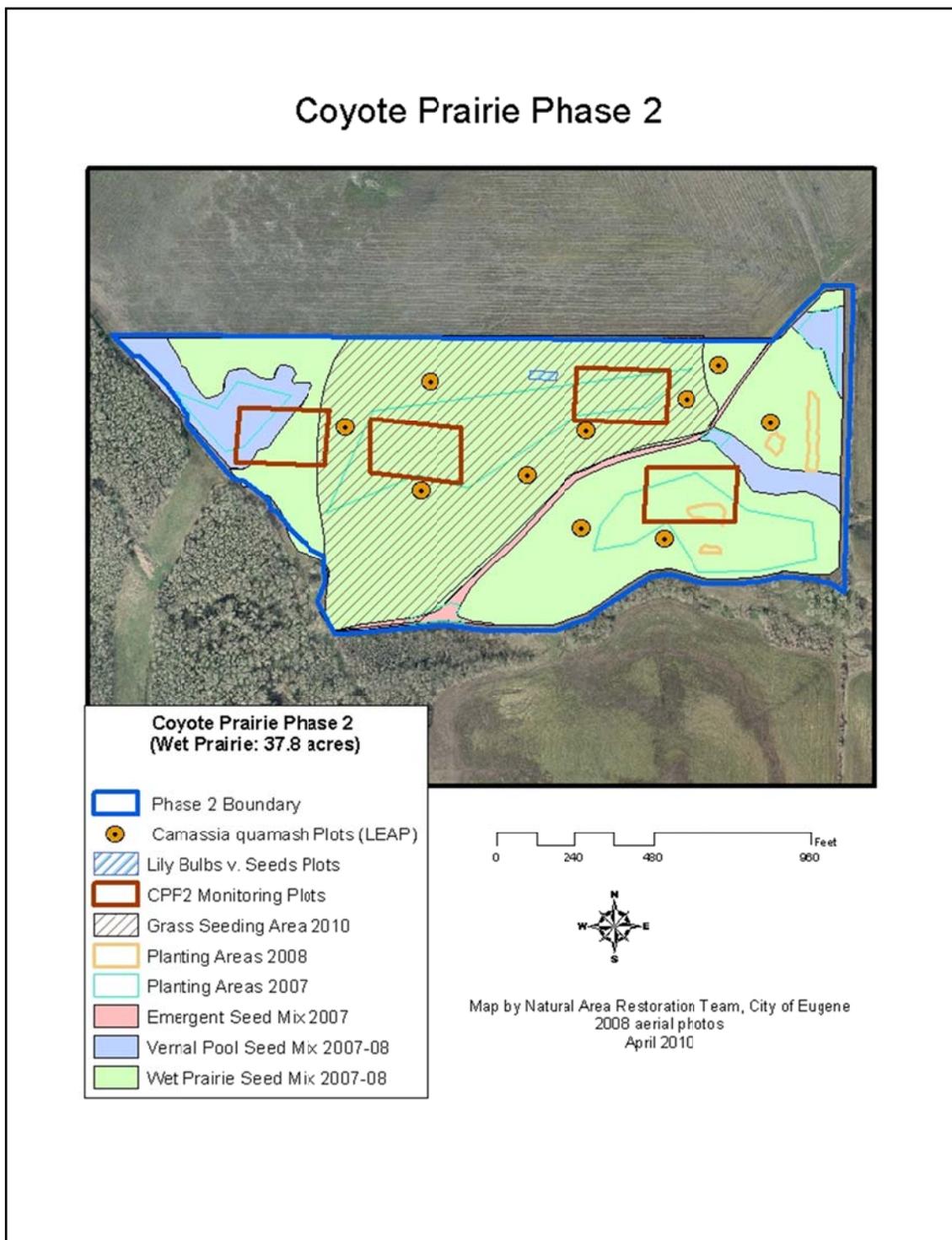


Figure 4.3. Coyote Prairie Phase 2 Project Map and Planting Plan.

Seed mixes, seeding/bulb planting areas, and monitoring macroplots are labeled for Phase 2 of Coyote Prairie.

Coyote Prairie 2011 Management Actions

Phase 1:

1. Early and mid-season weed assessments were conducted, and problem areas were GPSed, flagged in the field for follow up, and added to the GIS weed layer for this portion of the site.
2. Spot spraying of non-native invasive plant species, such as *Hypochaeris radicata*, *Mentha pulegium*, *Hypericum perforatum*, and *Rumex acetosella* occurred through June 2011.
3. Native seed mixes for upland prairie, wet prairie, and vernal pool communities were seeded into small areas of disturbance resulting from weed control in fall 2011 (Table 4.2).

Phase 2:

1. Early and mid-season weed assessments were conducted, and problem areas were GPSed, flagged in the field for follow up, and added to the GIS weed layer for this portion of the site.
2. Spot spraying to control *Hypochaeris radicata*, *Mentha pulegium*, *Hypericum perforatum*, *Lythrum hyssopifolia*, *Senecio jacobia*, and *Dipsacus fullonum* was undertaken through mid-July. Approximately two acres of the site were mowed in early July to remove dense vegetation in areas where *Mentha pulegium* had been problematic. The *Mentha* was sprayed in this area several weeks later. *Rumex crispus* was pulled by hand before setting seed, while soils were still soft, and flowering *Dipsacus fullonum* was cut by hand in the vicinity of the drainage swale.
3. Native seed mixes for wet prairie communities were seeded into small areas of disturbance resulting from weed control in fall 2011 (Table 4.2).

Table 4.2 Coyote Prairie Phases 1 and 2, Native Seed Mixes for Weed Control Areas 2011

This table includes the plant community type, species seeded, and the number of grams used per acre in each phase and mix. The 2011 seeding targeted only those small areas disturbed by control of invasive nonnative plant species.

| | Species | Phase 1 | Phase 2 |
|----|---|------------------------------|------------------------------|
| | Upland (0.1 acre) | Seeding Rate (g/acre) | Seeding Rate (g/acre) |
| 1 | <i>Achillea millefolium</i> | 60 | |
| 2 | <i>Achnatherum lemmonii</i> ssp. <i>lemmonii</i> | 300 | |
| 3 | <i>Agoseris grandiflora</i> | 300 | |
| 4 | <i>Clarkia amoena</i> | 200 | |
| 5 | <i>Collomia grandiflora</i> | 700 | |
| 6 | <i>Festuca roemerii</i> | 600 | |
| 7 | <i>Gila capitata</i> ssp. <i>capitata</i> | 2000 | |
| 8 | <i>Koeleria macrantha</i> | 200 | |
| 9 | <i>Lupinus polycarpus</i> | 700 | |
| 10 | <i>Madia gracilis</i> | 100 | |
| 11 | <i>Madia sativa</i> | 100 | |
| 12 | <i>Potentilla gracilis</i> var. <i>gracilis</i> | 860 | |
| 13 | <i>Ranunculus occidentalis</i> var. <i>occidentalis</i> | 300 | |
| 14 | <i>Rumex salicifolius</i> var. <i>salicifolius</i> | 600 | |
| 15 | <i>Sidalcea virgata</i> | 800 | |
| | Total | 7820 | |
| | Wet Prairie | 0.1 acre | 0.2 acre |
| 1 | Grasses | | |
| 2 | <i>Agrostis exarata</i> | 800 | |
| 3 | <i>Beckmannia syzigachne</i> | 800 | |
| 4 | <i>Deschampsia cespitosa</i> | 400 | |
| 5 | <i>Deschampsia elongata</i> | 780 | |
| 6 | <i>Hordeum brachyantherum</i> | 1600 | |
| 7 | Forbs | | |
| 8 | <i>Achillea millefolium</i> | | 60 |

Table 4.2 Coyote Prairie Phases 1 and 2, Native Seed Mixes for Weed Control Areas 2011

This table includes the plant community type, species seeded, and the number of grams used per acre in each phase and mix. The 2011 seeding targeted only those small areas disturbed by control of invasive nonnative plant species.

| | Species | Phase 1 | Phase 2 |
|----|---|----------------|----------------|
| 9 | <i>Epilobium densiflorum</i> | | 150 |
| 10 | <i>Grindelia integrifolia</i> | | 200 |
| 11 | <i>Juncus tenuis</i> | | 10 |
| 12 | <i>Lomatium nudicaule</i> | | 200 |
| 13 | <i>Luzula comosa</i> | | 200 |
| 14 | <i>Potentilla gracilis var. gracilis</i> | | 400 |
| 15 | <i>Rorippa curvisiliqua</i> | | 100 |
| 16 | <i>Rumex salicifolius var. salicifolius</i> | | 400 |
| | Total | 4380 | 1720 |
| | Vernal Pool (0.5 acre) | | |
| 1 | <i>Beckmannia syzigachne</i> | 916 | |
| 2 | <i>Epilobium densiflorum</i> | 120 | |
| 3 | <i>Grindelia integrifolia</i> | 600 | |
| 4 | <i>Hordeum brachyantherum</i> | 700 | |
| 5 | <i>Madia glomerata</i> | 40 | |
| 6 | <i>Plagiobothrys figuratus</i> | 600 | |
| 7 | <i>Rumex salicifolius var. salicifolius</i> | 800 | |
| | Total | 3776 | |

Coyote Prairie Management Actions for 2012

Phase 1: With the completion of the 2011 monitoring, Phase 1 has successfully met its performance criteria and will continue to be managed by City of Eugene staff. For 2012 and beyond, the City will be undertaking annual weed assessments and periodic vegetation monitoring in the wetland prairie. Management activities will be undertaken as needed to maintain prairie plant community structure and diversity including prioritized weed control and periodic mowing or burning.

Phase 2:

1. Conduct spring and summer weed assessments. Use integrated pest management strategies to remove non-native plants, focusing on *Mentha pulegium*, *Lythrum hyssopifolia*, *Hypochaeris radicata*, *Rumex crispus*, *Hypericum perforatum*, and other invasive forbs and grasses observed during weed mapping.
2. Consider conducting an ecological burn in 2013.
3. Add additional native seed if bare areas result from removal of non-native species.

Phase 2 Rare Plant Enhancement:

1. Handweed or spot-spray invasive non-native forbs (e.g. *Dipsacus fullonum*), if needed, after censusing and applying protective measures for *Lomatium bradshawii*.
2. Conduct selective mow and rake of thatch, similar to that done Fall 2010, if vole herbivory in spring 2012 or other environmental factors warrant it.

Table 4.3 Progress of the Coyote Prairie Unit Enhancement Toward Meeting Success Criteria.

The most recent data for each active mitigation phase are compared to their relevant performance criteria. A date in the cell indicates the year in which the data will be collected to evaluate the site’s success in meeting the associated criterion.

| Success Criteria in Mitigation Improvement Plan | Phase 1 | Goal Met? | Phase 2 | Goal Met? |
|---|-------------------------|---|-------------------------|-----------|
| Site status in the monitoring period | Year 5 of 5 | N/A | Year 4 of 5 | N/A |
| Hydric soils | Present | Yes | Present | Yes |
| Wetland Hydrology | Present | Yes | Present | Yes |
| Hydrophytic Vegetation | Planted and established | Yes | Planted and established | Yes |
| 50% native plant cover after 5 years | 2011 | Yes plant cover 76%-89%; 86%– 90% of plant cover is native | 2012 | TBD |
| The combined cover of <i>Phalaris arundinacea</i> , <i>Lolium multiflorum</i> , <i>Schedonorus phoenix</i> , <i>Dipsacus fullonum</i> , <i>Geranium lucidum</i> , <i>Mentha pulegium</i> , <i>Hypochaeris radicata</i> , <i>Rubus armeniacus</i> and other non-native species shall not exceed 15% of the total vegetative cover in the enhancements after 5 years. | 2011 | Yes of total plant cover, 10 – 14% is nonnative | 2012 | TBD |

C. Monitoring Methods and Results

Hydrology

a) Restoration staff conduct hydrologic monitoring in the winter of the second and fifth year of the 5-year monitoring period at Coyote Prairie. We assessed site hydrology during monitoring visits to Phase 1 on March 11 and April 1, 2011, by mapping soil saturation and inundation, and checked 10 soil pits along the wetland/upland boundary on the Phase's south side (Figure 4.2). Phase 2 will be assessed in 2012, its fifth monitoring year.

b) Results

Wetland hydrology is present throughout Phase 1 areas mapped as wetland. On both the March 11 and April 1 dates, soils were fully saturated, with inundated areas 0.25 inches deep in the central and north central wet prairie region of Phase 1 and more than 3" deep in the pool on the site's west side. Sampling of an array of soil pits extending into the small upland area on the south side of Phase 1, suggests that the wetland/upland transition may be farther south than was mapped in the original wetland delineation in 2006, resulting in a greater amount of wetland prairie in Phase 1. On both of sampling dates, all 10 sampled pit locations, including 3 that extended up to 20 m into the mapped upland area, had saturated soils to within 12 inches of the soil surface. In the original 2006 delineation, the monthly rainfall amount in the sampling month (March) was only 20% of normal, which may have influenced the greater amount of area mapped as upland in this region. For the purposes of this enhancement, no change in the mapped wetland/upland boundary is sought and wetlands are confirmed for all areas mapped as wetland in 2006 and on which the credit amounts are based.

Vegetation Monitoring

a) Methods

Species lists were created for both Phases 1 and 2 during meandering surveys throughout the phases in spring and summer 2011. The fifth and final year quantitative vegetation monitoring of Phase 1 also occurred in 2011 from June 9 to 17. All three permanent macroplots were monitored using the point-intercept technique as described in Appendix A.

b) Results

Phase 1 has met its fifth year vegetation performance criteria (Table 4.3). All 3 macroplots in Phase 1 have high plant cover (76% to 89%; Table 4.4). Cover values for bare ground range from 6 to 7%. Areas having litter as the substrate, with no living plant cover, ranged from 4 to 13% and were lowest in the macroplot that was primarily supports vernal pool and emergent natural communities.

Native plant cover values also continue to be high and herbaceous plant cover is multi-layered in all macroplots (native cover values range from 103% to 127%; Table 4.4). Of total vascular plant cover, 86% to 90% is native and 10% to 14% is nonnative. Most of the nonnative cover is provided by the only two nonnative species with cover values that exceed 5%: *Centaureum erythraeae* and *Lythrum portula*. *Lythrum portula* is an annual that grows 3-4 inches tall, in sparse to dense mats, in the emergent community of the wetland. Its short-stature, and annual lifecycle that ends as the soil dries in August, suggest that it is not likely to substantially affect

the perennial rushes, sedges, and taller forbs (e.g. *Grindelia integrifolia*) that current dominate this emergent area, although it may compete with native annuals. *Centaureum erythraeae* is an annual or biennial that is scattered in small patches in locations throughout the wet prairie.

Native species diversity also continues to be high in Phase 1. This is likely due to both the high number of natives that have been introduced by City restoration staff and due to the site's heterogeneity in both winter inundation levels and bare soil openings. In particular, small openings have remained uncolonized by rushes, sedges, and grasses, and thus are available for small native annuals, such as *Centunculus minimus* and *Crassula aquatic*, both of which were found in the Phase 1 wetlands in 2011 (and were not introduced in seed mixes). Within the 3 macroplots of Phase 1, botanical staff recorded 48 native species and 13 nonnative species during point-intercept monitoring. In compiling species lists (Appendix A), botany staff identified a total of 68 native species and 24 nonnative species throughout Phase 1. It is typical that species with lower cover values or small localized populations, as well as those on the site's edge, are recorded during walking surveys but not during quantitative monitoring. Overall, Phase 1 vegetation is characterized by diverse and dominant native perennials forbs, sedges, and rushes, with low grass cover, and continued habitat openings suitable for native annual species.

Table 4.4 Coyote Prairie Phase 1 Point-intercept Monitoring Results

Point-intercept percent cover monitoring results are presented for the 3 macroplots in Coyote Prairie Phase 1. Each macroplot is labeled with the sample size (number of points) monitored and its plant community type. Percent cover results are shown (with 90% binomial confidence intervals) for each species detected during monitoring.

| | Macroplot | Macroplot 1 | | | Macroplot 2 | | | Macroplot 3 | | |
|--------|--|--------------|--------|---------|--------------|--------|---------|----------------------|--------|---------|
| | Sample Size | 203 | | | 216 | | | 208 | | |
| | Plant Community | Wet Prairie | | | Wet Prairie | | | Vernal Pool Emergent | | |
| Origin | Species/Guild | % Cover | CI Low | CI High | % Cover | CI Low | CI High | % Cover | CI Low | CI High |
| | Native | 127.1 | | | 102.8 | | | 122.6 | | |
| | Introduced (nonnative) | 14.8 | | | 12.5 | | | 19.3 | | |
| | Total plant cover | 141.9 | | | 115.3 | | | 141.8 | | |
| | Total plant cover (relative) | 83.7 | | | 76.3 | | | 88.5 | | |
| | Bare ground (relative) | 5.9 | | | 6.5 | | | 7.2 | | |
| | Litter (relative) | 7.4 | | | 13 | | | 3.8 | | |
| | Moss (relative) | 3 | | | 4.2 | | | 0.5 | | |
| | Total | 100 | | | 100 | | | 100 | | |
| | % Native Plant Cover (of Total) | 89.6 | | | 89.2 | | | 86.4 | | |
| | % Non-native Plant Cover (of Total) | 10.4 | | | 10.8 | | | 13.6 | | |
| N | <i>Achillea millefolium</i> | 4.4 | 2.3 | 7.6 | 2.3 | 1.0 | 5.1 | | | |
| N | <i>Agrostis exarata</i> | | | | 0.5 | 0.0 | 2.3 | 0.5 | 0.0 | 2.3 |
| N | <i>Bromus carinatus</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| N | <i>Carex densa</i> | 2.0 | 0.7 | 4.5 | 1.9 | 0.7 | 4.5 | 3.8 | 2.0 | 7.0 |
| N | <i>Carex ovalis</i> | 1.0 | 0.2 | 3.1 | | 0.0 | 1.5 | 0.5 | 0.0 | 2.3 |
| N | <i>Carex unilateralis</i> | 0.5 | 0.0 | 2.3 | 1.4 | 0.4 | 3.8 | 34.6 | 28.9 | 40.4 |
| I | <i>Centaurium erythraeae</i> | 8.4 | 5.4 | 12.3 | 9.7 | 6.6 | 14.0 | | | |
| N | <i>Centunculus minimus</i> | 1.5 | 0.4 | 3.8 | | | | | | |
| I | <i>Cerastium glomeratum</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| N | <i>Crassula aquatica</i> | | | | | | | 1.9 | 0.7 | 4.5 |
| N | <i>Danthonia californica</i> | | | | 0.5 | 0.0 | 2.3 | | | |

Table 4.4 Coyote Prairie Phase 1 Point-intercept Monitoring Results

Point-intercept percent cover monitoring results are presented for the 3 macroplots in Coyote Prairie Phase 1. Each macroplot is labeled with the sample size (number of points) monitored and its plant community type. Percent cover results are shown (with 90% binomial confidence intervals) for each species detected during monitoring.

| | Macroplot | Macroplot 1 | | | Macroplot 2 | | | Macroplot 3 | | |
|--------|--|-------------|--------|---------|-------------|--------|---------|----------------------|--------|---------|
| | Sample Size | 203 | | | 216 | | | 208 | | |
| | Plant Community | Wet Prairie | | | Wet Prairie | | | Vernal Pool Emergent | | |
| Origin | Species/Guild | % Cover | CI Low | CI High | % Cover | CI Low | CI High | % Cover | CI Low | CI High |
| N | <i>Deschampsia cespitosa</i> | | | | 0.5 | 0.0 | 2.3 | 1.0 | 0.2 | 3.1 |
| N | <i>Eleocharis asicularis</i> | | | | | | | 4.3 | 2.3 | 7.6 |
| N | <i>Eleocharis obtusa</i> | | | | | | | 3.8 | 2.0 | 7.0 |
| N | <i>Eleocharis palustris</i> | 1.0 | 0.2 | 3.1 | | | | 8.2 | 5.4 | 12.3 |
| N | <i>Epilobium brachycarpum</i> | 0.5 | 0.0 | 2.3 | 0.5 | 0.0 | 2.3 | | | |
| N | <i>Epilobium ciliatum</i> | 2.5 | 1.0 | 5.1 | 3.7 | 2.0 | 7.0 | 2.4 | 1.0 | 5.1 |
| N | <i>Epilobium densiflorum</i> | 0.5 | 0.0 | 2.3 | | | | 1.0 | 0.2 | 3.1 |
| N | <i>Eriophyllum lanatum</i> var. <i>lanatum</i> | 2.5 | 1.0 | 5.1 | 4.6 | 2.3 | 7.6 | | | |
| I | <i>Galium divaricatum</i> | 2.5 | 1.0 | 5.1 | 0.9 | 0.2 | 3.1 | | | |
| N | <i>Galium trifidum</i> | | | | 0.5 | 0.0 | 2.3 | 2.9 | 1.3 | 5.7 |
| N | <i>Gnaphalium palustre</i> | 0.5 | 0.0 | 2.3 | 0.5 | 0.0 | 2.3 | 2.9 | 1.3 | 5.7 |
| N | <i>Gratiola ebracteata</i> | 0.5 | 0.0 | 2.3 | | | | 0.5 | 0.0 | 2.3 |
| N | <i>Grindelia integrifolia</i> | 19.7 | 15.2 | 24.9 | 13.4 | 9.6 | 17.9 | 9.1 | 6.2 | 13.4 |
| I | <i>Hypochaeris radicata</i> | 1.0 | 0.2 | 3.1 | 0.9 | 0.2 | 3.1 | | | |
| N | <i>Isoetes sp</i> | 3.4 | 1.6 | 6.4 | 0.9 | 0.2 | 3.1 | | | |
| N | <i>Juncus acuminatus</i> | | | | | | | 1.0 | 0.2 | 3.1 |
| N | <i>Juncus bolanderi</i> | | | | | | | 1.0 | 0.2 | 3.1 |
| N | <i>Juncus bufonius</i> | 3.4 | 1.6 | 6.4 | 2.3 | 1.0 | 5.1 | 3.4 | 1.6 | 6.4 |
| N | <i>Juncus effusus</i> var. <i>pacificus</i> | 2.0 | 0.7 | 4.5 | | | | 10.1 | 6.6 | 14.0 |
| N | <i>Juncus ensifolius</i> | 1.0 | 0.2 | 3.1 | 0.9 | 0.2 | 3.1 | 1.0 | 0.2 | 3.1 |
| N | <i>Juncus occidentalis</i> | 24.6 | 19.7 | 30.1 | 15.7 | 11.7 | 20.6 | 20.7 | 16.1 | 25.9 |
| N | <i>Juncus oxymeris</i> | | | | | | | 1.4 | 0.4 | 3.8 |
| N | <i>Juncus patens</i> | | | | | | | 0.5 | 0.0 | 2.3 |

Table 4.4 Coyote Prairie Phase 1 Point-intercept Monitoring Results

Point-intercept percent cover monitoring results are presented for the 3 macroplots in Coyote Prairie Phase 1. Each macroplot is labeled with the sample size (number of points) monitored and its plant community type. Percent cover results are shown (with 90% binomial confidence intervals) for each species detected during monitoring.

| | Macroplot | Macroplot 1 | | | Macroplot 2 | | | Macroplot 3 | | |
|--------|---|-------------|--------|---------|-------------|--------|---------|----------------------|--------|---------|
| | Sample Size | 203 | | | 216 | | | 208 | | |
| | Plant Community | Wet Prairie | | | Wet Prairie | | | Vernal Pool Emergent | | |
| Origin | Species/Guild | % Cover | CI Low | CI High | % Cover | CI Low | CI High | % Cover | CI Low | CI High |
| N | <i>Lasthenia glaberrima</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| I | <i>Leontodon taraxacoides</i> | 0.5 | 0.0 | 2.3 | 0.9 | 0.2 | 3.1 | | | |
| N | <i>Lotus formosissimus</i> | 1.5 | 0.4 | 3.8 | 3.7 | 2.0 | 7.0 | | | |
| N | <i>Lotus unifoliolatus</i> | | | | | | | | | |
| N | <i>Lotus unifoliolatus var. unifoliolatus</i> | 1.5 | 0.4 | 3.8 | 0.5 | 0.0 | 2.3 | | | |
| N | <i>Lupinus rivularis</i> | 5.4 | 3.1 | 8.8 | 3.2 | 1.6 | 6.4 | | | |
| N | <i>Luzula comosa</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| I | <i>Lythrum hyssopifolia</i> | | | | | | | 1.0 | 0.2 | 3.1 |
| I | <i>Lythrum portula</i> | | | | | | | 14.9 | 10.8 | 19.5 |
| N | <i>Madia elegans</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| N | <i>Madia glomerta</i> | 4.9 | 2.7 | 8.2 | | | | | | |
| I | <i>Mentha pulegium</i> | 1.0 | 0.2 | 3.1 | | | | 2.4 | 1.0 | 5.1 |
| N | <i>Montia linearis</i> | 1.0 | 0.2 | 3.1 | | | | 1.0 | 0.2 | 3.1 |
| N | <i>Phlox gracilis</i> | | | | | | | 1.0 | 0.2 | 3.1 |
| N | <i>Plagiobothrys figuratus</i> | 3.0 | 1.3 | 5.7 | 0.9 | 0.2 | 3.1 | 1.0 | 0.2 | 3.1 |
| I | <i>Poa pratensis</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| I | <i>Polygnum persicaria</i> | | | | | | | 0.5 | 0.0 | 2.3 |
| N | <i>Potentilla gracilis var. gracilis</i> | 3.4 | 1.6 | 6.4 | 5.1 | 2.7 | 8.2 | | | |
| N | <i>Prunella vulgaris var. lanceolata</i> | 30.0 | 24.8 | 35.8 | 37.5 | 31.8 | 43.4 | 0.5 | 0.0 | 2.3 |
| I | <i>Prunus avium</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| N | <i>Rorippa curvisiliqua</i> | 0.5 | 0.0 | 2.3 | | | | 0.5 | 0.0 | 2.3 |
| N | <i>Rumex salicifolius</i> | | | | 0.5 | 0.0 | 2.3 | | | |
| N | <i>Salix species</i> | | | | | | | 2.4 | 1.0 | 5.1 |

Table 4.4 Coyote Prairie Phase 1 Point-intercept Monitoring Results

Point-intercept percent cover monitoring results are presented for the 3 macroplots in Coyote Prairie Phase 1. Each macroplot is labeled with the sample size (number of points) monitored and its plant community type. Percent cover results are shown (with 90% binomial confidence intervals) for each species detected during monitoring.

| | Macroplot | Macroplot 1 | | | Macroplot 2 | | | Macroplot 3 | | |
|---------------|------------------------------|--------------------|---------------|----------------|--------------------|---------------|----------------|-----------------------------|---------------|----------------|
| | Sample Size | 203 | | | 216 | | | 208 | | |
| | Plant Community | Wet Prairie | | | Wet Prairie | | | Vernal Pool Emergent | | |
| Origin | Species/Guild | % Cover | CI Low | CI High | % Cover | CI Low | CI High | % Cover | CI Low | CI High |
| N | <i>Saxifraga oregana</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| N | <i>Symphyotrichum hallii</i> | 0.5 | 0.0 | 2.3 | 1.4 | 0.4 | 3.8 | | | |
| I | <i>Vulpia bromoides</i> | 0.5 | 0.0 | 2.3 | | | | | | |
| I | <i>Vulpia myuros</i> | | | | | | | 0.5 | 0.0 | 2.3 |

Phase 2 Remnant, *Lomatium bradshawii* Monitoring, 2011

a) Methods

This population is located in a remnant prairie patch of about 1.5 acres. The *L. bradshawii* are found within an approximately 25 square meter area of this remnant. The annual census of the *L. bradshawii* population in the remnant area of Phase 2 was conducted on April 22, 2011. All individuals were flagged with pin flags 6 inches west of the plant and plants were classified by leaf number and flowering status: 1-leaved, 2-leaved or 3-leaved, and flowering with 1, 2, or ≥ 3 flowering stalks (inflorescences) present. If distinguishing an individual was in doubt, clusters of stems 2 cm or more apart were classified as separate individuals.

b) Results

In 2011, the number of *Lomatium bradshawii* plants increased from the previous year and was the second highest recorded in 6 years of monitoring (Table 4.5). Of the 30 individuals present in 2011, 23% flowered and 7% produced 2 or more flowers. Staff observed no vole herbivory in 2011, as compared to 2010 when vole trails were evident in both subpopulations and herbivory of stems occurred on over 20% of the population. The reduced vole herbivory was likely due to the lack of vole sheltering areas that resulted from the the fall 2010 mowing and thatch removal that City staff undertook to enhance the *Lomatium bradshawii* population, although it could also be due to natural annual variation in vole numbers in this remnant prairie.

Since the first monitoring in 2006, the population size has increased, with the greatest number of plants and greatest number of plants flowering (and thus likely the year of greatest reproduction) occurring in the growing year following the ecological burn (conducted fall 2008) (Table 4.5). In the second year following the burn plant numbers had returned to near pre-burn levels, suggesting that the beneficial effects of the burn on this species via nutrient addition, thatch removal, reduced plant competition, and/or reduced vole numbers was strong in only its first post-treatment year. Mowing with a hand-held weed-eater and careful raking may be needed annually starting the second growing season after an ecological burn (or starting in the fall after the first growing season) to enhance this population.

Table 4.5 *Lomatium bradshawii* Census Results, Coyote Prairie Phase 2 remnant.

| Plant size/vigor | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|--|--------|---------|---------|----------|---------|--------|
| Number of plants vegetative | 14 | 15 | 12 | 25 | 15 | 23 |
| Number producing 1 flower | 2 | 2 | 5 | 3 | 5 | 5 |
| Number producing 2 or more flowers (percent of total plants) | 1 (6%) | 5 (23%) | 6 (26%) | 12 (30%) | 5 (20%) | 2 (7%) |
| Total plants recorded | 17 | 22 | 23 | 40 | 25 | 30 |

Phase 2 Lilaceae Establishment Assessment Project

a) Methods

This project was implemented in fall 2007, along with the first native seeding of Phase 2, to track how well camas and other members of the Lily family established from seed in our wetland prairie restorations. In 2011, restoration staff censused all flowering plants to

determine the average number of *Camassia quamash* flowering in the 10 circular plots where *Camassia quamash* had been seeded at known rates in December 2007. All plants, including vegetative individuals, were counted in two of the ten circular plots. A more detailed monitoring will occur in spring 2012.

b) Results

The first flowering of these plants occurred in 2011, their 4th growing season. Most plants were 5 to 10" tall, two-leaved, and did not flower in 2011. Only 3-leaved plants were observed flowering. The average number of *Camassia quamash* plants flowering per plot was 11, which was less than 5% of the average number of *C. quamash* plants recorded in the two plots in which all plants (vegetative and flowering) were counted.

Wildlife Utilization

Raptors (such as Northern harriers, short-eared owls and white-tailed kites) and songbirds continue to be frequently sighted in Coyote Prairie Phases 1 and 2. Savannah sparrows were observed nesting in both Phases 1 and 2 in 2011. Bald eagles were spotted by volunteers conducting aquatic monitoring in 2010. Ducks are occasionally observed using the pools in Phase 1 in winter and spring.

Caddisfly larvae and other invertebrates (e.g. ostracods, copepods) are annually present in pooled and flowing water in Phases 1 and 2. In 2011, a group of volunteers from the local chapter of the North American Butterfly Association conducted butterfly surveys at Coyote Prairie from April through September. Although the weather resulted in an overall poor year for observing butterflies in the southern Willamette Valley, surveyors documented hundreds of individual butterflies of 16 species in Phase 1 and 12 species in Phase 2.

Salamander larvae (probably long-toed salamander, although identification was not confirmed) and Pacific tree frog larvae were noted in the eastern tributary to Coyote Creek that flows along the north boundary of Phase 1 in spring 2010 and Pacific tree frog larvae were again present in 2011 in Phase 1 and in the drainage that bisects Phase 2. In April 2011, staff found a female northern red-legged frog in the eastern seasonal tributary to Coyote Creek that flows along the Phase 1 north boundary. Northern red-legged frogs had also been reported in this area in the 2006 wetland delineation for Coyote Prairie.

Adult coyotes have been observed in both project phases, and herds of Roosevelt elk occasionally cross the restoration areas, as evidenced by tracks and scat. Bears have been observed by contractors and bear scat was evident in Phase 1 in 2009 and 2010.

Appendix A. Monitoring Methods

A. Overview

The standard plan and the protocol for quantitative vegetative monitoring were both developed in 1994 (see 1994 Annual Report for details). A mitigation bank monitoring strategy was developed in the spring of 1997 describing mitigation goals and monitoring objectives common to all sites, site-specific goals, and monitoring objectives for existing restoration and enhancement projects. A standard field protocol for qualitative quarterly site monitoring was implemented in the fall of 1997. As new Mitigation Improvement Plans (MIPs) were written, mitigation goals and monitoring objectives were added. Improvements to the protocol were made based on field experiences in 1998. A discussion of each type of monitoring is provided in the following sections.

B. Quarterly Monitoring

Photopoints

Purpose: Photos document surface hydrology and vegetation structure. Photos are taken pre- and post- treatment to show landscape level changes.

Method:

1. Permanent photo stations are established with metal stakes in a sufficient number to provide photo coverage of most restored and enhanced areas at all current sites.
2. Photographs are taken pre- and post-project and documented by photopoint number and compass bearing (and landmarks).

Hydrology

Purpose: Assess whether wetland hydrology occurs throughout the restoration site. The extent of soil saturation during the growing season (March 3 – November 21; NRCS data for Lane County) is an important factor in determining jurisdictional wetlands.

Method:

1. Quarterly site visits during the fall, winter, and spring include a brief description of the location, extent, and depth of standing water at each site.
2. The timing of the quarterly visits in the fall and spring should correspond with the beginning and end of the growing season, if possible.
3. The winter visit should document the maximum standing water depth and extent in emergent pools.

C. Vegetation Monitoring

Overall Goal: Assess the establishment of hydrophytic vegetation within restoration sites and monitor the status of hydrophytic vegetation in enhancement sites.

Species Lists

Purpose: Assess plant species richness at each site. Also used for sites where the following Bank MOA performance standard applies: "At least 70 percent of the planted or seeded native plants shall be present at the end of the five year monitoring period."

Method:

1. The species list should be collected once early in the growing season (late May to mid-June) and once late in the growing season (early to mid-August).
2. A species list is compiled by thoroughly walking through a site while filling out the species checklist.

Planting Establishment Assessments

Purpose: To provide an early qualitative assessment of seeding success.

Method:

1. The assessment should take place once early in the growing season (late May to mid-June) and once late in the growing season (early to mid-August).
2. Each native species is noted, while also recording whether its presence in the restoration is 'Dominant,' 'Common,' 'Uncommon,' or present only in 'Trace' amounts."

Point-intercept Sampling

Purpose: To address the performance criteria for species importance in wetland restorations, as identified in the individual Mitigation Improvement Plan or (applicable to some sites) in the MOA as: "...the restored wetland shall be dominated by native plant species where their total represents at least 50% cover after 2 years and 70% cover 5 years."

Methods:

1. The area (or areas) chosen to represent the site's progress are delineated by a macroplot (or macroplots) that are sample in the 2nd and 5th years.
2. The sampling method within each macroplot is referred to as systematic sampling with a random start.
 - a. The maximum point spacing is computed to fit 200 points (explained below in number 3) in each macroplot.
 - b. One side of the macroplot is chosen as the baseline (X), from which transects are run at 90 degrees (Y). The location of the first transect along the baseline is chosen randomly from between 0 and 5 m, while the first sampling location along the Y axis is also selected randomly from between 0 and 4 m.
3. Each observation (or point) is obtained by lowering a vertical cylindrical metal rod with a sharp pin at the tip to note which species are covering the ground at that location.
4. The habitat type of each point is also noted (emergent, vernal pool, *Deschampsia cespitosa* dominated wet prairie, side slope, or old field).
5. The percentage of ground covered by each species is calculated by dividing the total number of observations of each plant by the total number of points. Cover estimates are given with 90% binomial confidence intervals.
6. In reports prior to 2008, the method of summarizing native and non-native vegetation cover did not take into account the multi-layered vegetation that can develop on a site. The previous method recorded a point as either native, non-native, both or neither. It therefore

tended to underestimate native or non-native cover that was multi-layered. Since 2008 the data are summarized in the following ways:

| |
|---|
| Native: <i>the sum of all individual native vascular plant species cover values.</i> |
| Nonnative/Introduced : <i>the sum of all individual non-native vascular plant species cover values.</i> |
| Total Plant Cover: <i>the sum of all vascular plants species cover values.</i> |
| Total Plant Cover (relative) : <i>the number of pin drops out of the total pin drops that hit a vascular plant; one hit is recorded, no matter how many times it intersects plants in the herbaceous layer</i> |
| Bare ground (relative): <i>bare ground litter and moss are recorded only when a pin drop doesn't hit a plant. These are exclusive categories, without overlap. Together, Total Plant Cover, Bare Ground, Litter, and Moss will sum to 100.</i> |
| Litter (relative): <i>bare ground, litter, and moss are recorded only when a pin drop doesn't hit a plant. These are exclusive categories, without overlap.</i> |
| Moss (relative) : <i>bare ground, litter, and moss are recorded only when a pin drop doesn't hit a plant. These are exclusive categories, without overlap.</i> |
| If the MIP identifies that a performance standard is in relation to total plant cover, then the percent native and non-native plant cover of total plant cover are also reported. |

Frequency Sampling

Purpose: Where applicable, to assess the progress of each site in meeting the Bank MOA performance standard on species type, which states that, "Of the plant species occurring at a 50% frequency rate or greater, at least 75% shall be from the Native Plant list of the West Eugene Wetlands Plan." These data are also used to assess the site's progress on the diversity and structure goals for wet prairie and emergent habitats. A minimum of 10 native species should occur at 10% frequency rate or greater in wet prairie, while a minimum of 5 native species should occur at a 10% frequency rate or greater in emergent habitats.

Method:

1. Macroplot setup and sampling are similar to the point-intercept methods; however, only 100 observations are required.
2. Each observation consists of noting the presence of each species in a 1 x 1m frame.
3. To obtain the frequency value for each species, the number of times a species is observed within the frame is divided by the total number of frames observed (100). Frequency estimates are also reported with 90% binomial confidence intervals.

Line-intercept Sampling

Purpose: To assess the progress of each site in meeting goals of woody vegetation removal for enhancement areas. For these site-specific goals, refer to the MIP for the enhancement of interest.

Method:

1. The line-intercept method is utilized for estimating the percent cover of shrubs in an enhancement area.
2. Transects are run perpendicular to the macroplot baseline. The segments of the transect that are covered by shrubs are recorded.
3. The percent cover of each shrub species is computed by dividing the length of all transects covered by that species by the combined length of all transects.

Rare Plant Census

Purpose: To monitor the population changes of the rare and endangered species on Bank enhancement areas. Where applicable, these data will also be used to assess the effects of management actions on the populations of rare species.

Methods for *Erigeron decumbens* var. *decumbens*, *Lomatium bradshawii*, and *Horkelia congesta* ssp. *congesta*:

1. Macroplots were delineated around the entire populations of these rare species where they occur. The macroplot is divided into 1m² plots, and all plots are censused. For large macroplots like that for *Erigeron decumbens* var. *decumbens*, 1-m² plots were monitored in corridors, using tape measures to delineate boundaries and improve accuracy.
2. The total number of crowns (plants > 3.5 cm apart), flowering heads (capitula, referred to in the data as “flowers”), and reproductive crowns are recorded for *Erigeron decumbens* var. *decumbens*. The total number of crowns, flowering stems per crown, and reproductive crowns are recorded for *Horkelia congesta* ssp. *congesta*. For *Lomatium bradshawii*, the total number of plants, leaves and flowering stalks are counted and categorized (e.g. 1 umbel, 2 umbels, 3 or more umbels). Although *Lomatium bradshawii* does not reproduce vegetatively, large plants can have leaves that arise in a cluster, so if individuals are difficult to discern, then stems arising less than 2 cm apart are considered part of the same plant.

Methods for *Aster curtus*:

All populations at Oxbow West and Balboa

1. Each population is marked by a rebar placed approximately in the center of the populations.
2. The total number of ramets is obtained by dividing the populations into sections and counting all individuals in each section.

Populations that fall within macroplots for other rare species (North Greenhill Ash Grove and Balboa)

1. The macroplot is divided into 1m² plots, and all plots are sampled.
2. The presence or absence of *Aster curtus* is noted in each plot. The frequency of *Aster curtus* is obtained for each macroplot. (The total number of ramets is not obtained.)

Methods *Lupinus sulphureus* ssp. *kincaidii*:

1. Macroplots were delineated around the entire population. The macroplot is divided into 1m² plots, and all plots are sampled.
2. The total number of leaves and inflorescences are tallied for the macroplot by counting them in each plot.

Wildlife Surveys

Purpose: To document wildlife usage in restoration and enhancement sites.

Method: Volunteers and the wetland staff make note of wildlife sightings as they occur.

APPENDIX B: Plant Species Lists for Mitigation Bank Sites

The species observed on each site are recorded by noting the section or phase of the restoration or enhancement area in which they were found.

| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|---|---------------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| Scientific Name | Common Name | Origin | | | | | |
| <i>Achillea millefolium</i> | Yarrow | N | X | X | X | X | X |
| <i>Agrostis exarata</i> | spike bentgrass | N | X | | X | X | X |
| <i>Agrostis stolonifera/capillaris</i> | fiorin (bentgrass) | I | X | X | | | |
| <i>Aira caryophyllea</i> | silver hairgrass | I | | | | | |
| <i>Alisma lanceolatum</i> | narrowleaf waterplantain | I | | | | | |
| <i>Alisma trivale</i> | northern waterplantain | N | X | | X | X | |
| <i>Allium amplexans</i> | Slim leaf onion | N | X | X | X | X | X |
| <i>Alopecurus geniculatus</i> | water foxtail | N | X | | X | X | |
| <i>Alopecurus pratensis</i> | meadow foxtail | I | X | X | X | | X |
| <i>Amelanchier alnifolia</i> | western serviceberry | N | | | | | X |
| <i>Anagallis arvensis</i> | scarlet pimpernel | I | | | X | X | |
| <i>Anaphalis margaritacea</i> | pearly everlasting | N | | | | | |
| <i>Anthemis cotula</i> | mayweed chamomile | I | X | X | | | |
| <i>Anthoxanthum odoratum</i> | sweet vernalgrass | I | | | | | X |
| <i>Anthriscus caucalis</i> | bur chervil | I | | | | | X |
| <i>Asclepias speciosa</i> | showy milkweed | N | X | | | | |
| <i>Aster curtus</i> | rigid white topped aster | N | | | | | |
| <i>Beckmannia syzigachne</i> | American sloughgrass | N | X | | X | X | X |
| <i>Bidens sp.</i> | | | X | | | | |
| <i>Bidens frondosa</i> | leafy beggars-tick | N | X | | | | |
| <i>Briza minor</i> | little quaking-grass | I | X | | | | X |
| <i>Brodiaea coronaria</i> | harvest brodiaea | N | | | | | |
| <i>Brodiaea elegans</i> | harvest brodiaea | N | | | | X | X |
| <i>Bromus hordeaceus</i> | soft brome | I | | | | X | X |
| <i>Calandrinia ciliata</i> | red maids | N | X | | | | |
| <i>Camassia leichtlinii</i> | tall camas | N | | | | X | X |
| <i>Camassia quamash</i> | common camas | N | X | | | X | X |
| <i>Cardamine hirsuta</i> | hairy bittercress | I | X | X | | X | |
| <i>Cardamine penduliflora</i> | Willamette V. bittercress | N | | | | | |
| <i>Carex densa</i> | dense sedge | N | X | | X | X | X |
| <i>Carex feta</i> | green-sheath sedge | N | X | | X | | |
| <i>Carex leporine (formerly considered C. ovalis)</i> | hare sedge | N | | | X | | X |
| <i>Carex obnupta</i> | slough sedge | N | | | X | | |
| <i>Carex tumulicola</i> | foothill sedge | N | | | | | X |
| <i>Carex unilateralis</i> | one-sided sedge | N | X | | X | X | X |
| <i>Carex vesicaria</i> | blister sedge | N | | | | | |
| <i>Castilleja tenuis</i> | hairy owl-clover | N | X | X | X | X | X |
| <i>Centaurium erythraeae</i> | common centaury | I | X | X | X | X | X |

APPENDIX B: Plant Species Lists for Mitigation Bank Sites

The species observed on each site are recorded by noting the section or phase of the restoration or enhancement area in which they were found.

| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|--|----------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| <i>Centaurium muhlenbergii</i> | monterey centaury | N | | | | | |
| <i>Centunculus minimus</i> | Chaffweed | N | | | X | | |
| <i>Cerastium glomeratum</i> | sticky chickweed | I | X | X | X | X | X |
| <i>Cicendia quadrangularis</i> | Timwort | N | X | | | | |
| <i>Cirsium arvense</i> | Canada thistle | I | X | | | | X |
| <i>Cirsium vulgare</i> | bull thistle | I | | | | X | X |
| <i>Clarkia amoena</i> | farewell-to-spring | N | X | X | X | X | |
| <i>Clarkia purpurea</i> | winecup clarkia | N | X | X | | X | X |
| <i>Collomia grandiflora</i> | grand collomia | N | | X | | X | |
| <i>Convolvulus arvensis</i> | bindweed | I | X | | | | |
| <i>Conyza canadensis</i> | Canadian horseweed | I | | | | | |
| <i>Crassula aquatica</i> | water pygmy weed | N | | | X | | |
| <i>Crataegus monogyna</i> | English hawthorn | I | | | | | |
| <i>Crataegus suksdorfii</i> | black hawthorn | N | | | | | X |
| <i>Crataegus suksdorfii X monogyna</i> | Hybrid hawthorn | I | | | | | |
| <i>Crepis capillaries</i> | smooth hawksbeard | I | | | | X | |
| <i>Crepis setosa</i> | bristly hawksbeard | I | X | X | | | |
| <i>Cynosurus echinatus</i> | hedgehog dogtail | I | | | X | | |
| <i>Cyperus eragrostis</i> | tall flatsedge | I | | | | | X |
| <i>Danthonia californica</i> | California oatgrass | N | X | | | X | |
| <i>Daucus carota</i> | Queen Anne's lace | I | X | X | | X | X |
| <i>Deschampsia cespitosa</i> | tufted hairgrass | N | X | X | X | X | X |
| <i>Deschampsia danthonioides</i> | annual hairgrass | N | X | | | | |
| <i>Dianthus armeria</i> | Deptford pink | I | | | | X | X |
| <i>Dichanthelium acuminatum var. fasciculatum</i> | western witchgrass | N | | | | X | X |
| <i>Dichelostemma congestum</i> | ookow | N | | | | X | |
| <i>Dipsacus fullonum</i> | Teasel | I | | | | X | X |
| <i>Downingia elegans</i> | showy downingia | N | X | X | | X | |
| <i>Downingia yina</i> | Willamette downingia | N | X | | X | X | X |
| <i>Echinochloa crus-galli</i> | large barnyard-grass | I | X | | | X | |
| <i>Eleocharis acicularis</i> | needle spike-rush | N | | | X | | |
| <i>Eleocharis obtusa</i> | common spike-rush | N | X | | X | X | |
| <i>Eleocharis palustris</i> | common spikerush | N | X | | X | X | |
| <i>Epilobium angustifolium (Chamerion angustifolium)</i> | perennial fireweed | N | | | | X | |
| <i>Epilobium brachycarpum</i> | autumn willowherb | N | X | X | X | X | X |
| <i>Epilobium ciliatum</i> | hairy willowherb | N | X | | X | X | X |
| <i>Epilobium densiflorum</i> | dense spike-primrose | N | X | X | | X | X |
| <i>Epilobium pygmaeum</i> | smooth willowherb | N | | | | | |
| <i>Equisetum sp.</i> | Horsetail | N | | | | | |
| <i>Eriophyllum lanatum</i> | wooly sunflower | N | X | X | X | X | X |

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The species observed on each site are recorded by noting the section or phase of the restoration or enhancement area in which they were found.

| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|---|------------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| <i>Eryngium petiolatum</i> | coyote thistle | N | X | | | X | |
| <i>Elymus glaucus</i> | western ryegrass | N | | | | | |
| <i>Festuca arundinacea</i> (<i>Schedonorus phoenix</i>) | tall fescue | I | | | | X | X |
| <i>Festuca roemerii</i> | Roemer's fescue | N | X | | | | |
| <i>Fragaria virginiana</i> ssp. <i>platypetala</i> | mountain strawberry | N | | X | X | X | |
| <i>Fraxinus latifolia</i> | Oregon ash | N | X | X | | X | X |
| <i>Galium aparine</i> | catchweed | N | | | | X | |
| <i>Galium divaricatum</i> (Formerly <i>G. parisiense</i>) | wall bedstraw | I | X | | X | X | |
| <i>Galium</i> sp. | bedstraw sp. | N/I | | | | | X |
| <i>Galium trifidum</i> | small bedstraw | N | X | X | X | X | |
| <i>Galium triflorum</i> | Fragrant bedstraw | N | | | | | |
| <i>Gentiana sceptrum</i> | King's gentian | N | | | | | |
| <i>Geranium dissectum</i> | cut-leaved geranium | I | X | X | X | X | X |
| <i>Geranium lucidum</i> | Shining Geranium | I | | | | X | |
| <i>Geum macrophyllum</i> | large-leaf avens | N | | | | | |
| <i>Gilia capitata</i> | bluehead gilia | N | | X | | X | |
| <i>Glyceria occidentalis</i> | western mannagrass | N | | | | | |
| <i>Gnaphalium palustre</i> | lowland cudweed | N | X | X | X | X | |
| <i>Gnaphalium purpureum</i> | purple cudweed | N | | | X | | |
| <i>Gnaphalium stramineum</i> | cotton batting plant | N | | | X | | |
| <i>Gnaphalium uliginosum</i> | marsh cudweed | I | | | X | | |
| <i>Gratiola ebracteata</i> | bractless hedge-hyssop | N | X | | X | X | |
| <i>Grindelia integrifolia</i> | Willamette V. gumweed | N | X | X | X | X | X |
| <i>Heracleum lanatum</i> | cow parsnip | N | | | | X | |
| <i>Holcus lanatus</i> | velvet grass | I | | X | | | X |
| <i>Hordeum brachyantherum</i> | meadow barley | N | X | | | X | |
| <i>Hordeum marinum</i> | Mediterranean barley | I | X | | | | |
| <i>Hypericum perforatum</i> | St. John's-wort | I | X | X | | X | X |
| <i>Hypochaeris radicata</i> | false dandelion | I | X | X | X | X | X |
| <i>Isoetes</i> sp. | Quillwort | N | | | X | | |
| <i>Juncus acuminatus</i> | tapered rush | N | X | | X | | |
| <i>Juncus articulatus</i> | jointed rush | N | | | | | X |
| <i>Juncus bolanderi</i> | Bolander's rush | N | X | | X | X | |
| <i>Juncus bufonius</i> | toad rush | N | X | X | X | X | X |
| <i>Juncus effusus</i> var. <i>pacificus</i> | soft rush | N | X | | X | | |
| <i>Juncus effusus</i> var. <i>effusus</i> | common rush | I | X | | | | |
| <i>Juncus ensifolius</i> | Swordleaf rush | N | | | X | | |
| <i>Juncus marginatus</i> | grass-leaf rush | I | X | | X | | |
| <i>Juncus nevadensis</i> | Nevada rush | N | | | | | X |

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| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|---|------------------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| <i>Juncus oxymeris</i> | pointed rush | N | X | | X | | |
| <i>Juncus patens</i> | Spreading rush | N | X | | X | | X |
| <i>Juncus occidentalis</i> (<i>Juncus tenuis</i> var. <i>congestus</i>) | slender rush | N | X | X | X | X | X |
| <i>Kickxia elatine</i> | cancerwort | I | X | X | | | |
| <i>Lactuca saligna</i> | willow lettuce | I | | X | | X | |
| <i>Lactuca serriola</i> | prickly lettuce | I | X | X | | X | X |
| <i>Lasthenia glaberrima</i> | smooth lasthenia | N | X | | X | X | |
| <i>Lathyrus aphaca</i> | yellow vetch | I | | | | X | |
| <i>Lathyrus hirsutus</i> | rough pea | I | | X | | | |
| <i>Lathyrus sphaericus</i> | grass pea | I | X | | | | |
| <i>Leontodon taraxacoides</i> | hairy hawkbit | I | X | X | X | X | X |
| <i>Leucanthemum vulgare</i> | oxeye daisy | I | X | | X | | X |
| <i>Linum bienne</i> | pale flax | I | X | X | X | | X |
| <i>Lolium multiflorum</i> | Italian ryegrass | I | X | X | | X | X |
| <i>Lomatium bradshawii</i> | Bradshaw's desert parsley | N | | | | | X |
| <i>Lomatium nudicaule</i> | barestem desert- parsley | N | X | | | X | X |
| <i>Lotus corniculatus</i> | bird'sfoot trefoil | I | | | X | | |
| <i>Lotus formosissimus</i> | seaside lotus | N | X | | X | X | |
| <i>Lotus micranthus</i> | small-flowered deervetch | N | | | | | |
| <i>Lotus unifoliolatus</i> | Spanish-clover | N | X | X | X | X | X |
| <i>Lupinus affinis</i> | fleshy lupine | N | X | | | | |
| <i>Lupinus bicolor</i> | field lupine | N | X | X | | X | |
| <i>Lupinus polyphyllus</i> | bigleaf lupine | N | X | X | | X | |
| <i>Lupinus rivularis</i> | stream lupine | N | X | X | X | X | |
| <i>Lupinus sulphureus</i> ssp. <i>kincaidii</i> | Kincaid's lupine | N | X | X | | | |
| <i>Luzula comosa</i> | field woodrush | N | X | | X | X | X |
| <i>Lythrum hyssopifolia</i> | hyssop loosestrife | I | X | X | X | X | X |
| <i>Lythrum portula</i> | water-purslane | I | X | | X | X | |
| <i>Madia elegans</i> | showy tarweed | N | X | X | X | X | X |
| <i>Madia glomerata</i> | cluster tarweed | N | X | | X | X | X |
| <i>Madia sativa</i> | coast tarweed | N | X | X | X | X | X |
| <i>Malus fusca</i> | western crab-apple | N | | | | | |
| <i>Matricaria discoidea</i> | pineapple weed | N | X | | | | |
| <i>Melilotus alba</i> | white sweetclover | I | X | | | | |
| <i>Mentha pulegium</i> | pennyroyal | I | X | X | X | X | X |
| <i>Microseris laciniata</i> | cut-leaved microseris | N | X | X | | X | X |
| <i>Mimulus guttatus</i> var. <i>depauperatus</i> | depauperate monkeyflower | N | X | | | X | X |
| <i>Moenchia erecta</i> | Moenchia | I | | | | | X |

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| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|--|------------------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| <i>Montia linearis</i> | narrow-leaved montia | N | X | | X | X | |
| <i>Myosotis discolor</i> | yellow & blue forget me not | I | X | | X | X | X |
| <i>Myosotis laxa</i> | small-flowered forget me not | N | | | X | X | |
| <i>Navarretia intertexta</i> | needle-leaved navarretia | N | X | | X | X | X |
| <i>Navarretia squarrosa</i> | skunkweed | N | | | | X | X |
| <i>Navarretia willamettensis</i> | Willamette navarretia | N | X | | | | |
| <i>Nemophila menziesii</i> | baby blue eyes | N | | X | | X | |
| <i>Orthocarpus bracteosus</i> | rosy owl-clover | N | X | | | X | |
| <i>Orobanche californica</i> ssp. <i>californica</i> | California broomrape | N | | | | | |
| <i>Panicum capillare</i> | common witchgrass | N | | | X | | |
| <i>Parentucellia viscosa</i> | yellow parentucellia | I | X | X | X | X | X |
| <i>Perideridia montana</i> | Gairdner's yampah | N | | | | X | |
| <i>Perideridia oregana</i> | Oregon yampah | N | X | | | | X |
| <i>Phalaris aquatica</i> | Harding grass | I | | | | | |
| <i>Phalaris arundinacea</i> | reed canarygrass | I | X | | | | |
| <i>Phleum pratense</i> | Timothy | I | | | | | |
| <i>Phlox gracilis</i> | pink microsteris | N | X | | X | X | |
| <i>Plagiobothrys figuratus</i> | fragrant popcorn-flower | N | X | X | X | X | X |
| <i>Plagiobothrys scouleri</i> | Scouler's popcorn-flower | N | X | | X | X | |
| <i>Plantago lanceolata</i> | English plantain | I | X | | | | X |
| <i>Plectritis congesta</i> | rosy plectritis | N | X | X | X | X | X |
| <i>Poa annua</i> | annual bluegrass | I | X | | | X | |
| <i>Poa compressa</i> | Canada bluegrass | I | | | | | |
| <i>Poa</i> sp. | bluegrass sp | I | | | | X | |
| <i>Polygonum aviculare</i> | doorweed | I | | | | | |
| <i>Polygonum douglasii</i> | douglas knotweed | N | | | | | |
| <i>Polygonum hydropiperoides</i> | marshpepper smartweed | N | | | X | | |
| <i>Polygonum persicaria</i> | heartweed | I | X | | X | X | |
| <i>Populus trichocarpa</i> | black cottonwood | N | | | X | | |
| <i>Portulaca oleracea</i> | little hogweed | I | | | | | |
| <i>Potentilla gracilis</i> | slender cinquefoil | N | X | X | X | X | X |
| <i>Prunella vulgaris</i> var. <i>lanceolata</i> | self-heal | N | X | X | X | X | X |
| <i>Prunus</i> sp. | plum | I | | | | | |
| <i>Psilocarphus</i> spp. | wooly heads | N | | | | | |
| <i>Pyrocoma racemosa</i> | racemed goldenweed | N | | | | | |
| <i>Pyrus communis</i> | pear | I | | | | | X |
| <i>Pyrus malus</i> | apple | I | | | | | |
| <i>Ranunculus alismaefolius</i> | water-plantain | N | | | | | |

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| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|---|-----------------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| | buttercup | | | | | | |
| <i>Ranunculus aquatilis</i> | white water buttercup | N | | | | | |
| <i>Ranunculus flammula</i> | creeping buttercup | N | | | | | |
| <i>Ranunculus occidentalis</i> | western buttercup | N | | X | X | X | X |
| <i>Ranunculus orthorhynchus</i> | straight beaked buttercup | N | X | | | X | X |
| <i>Ranunculus sceleratus</i> | celery-leaf butter-cup | N | | | | | |
| <i>Rhamnus purshiana</i> | casacara | N | | | | | |
| <i>Rorippa curvisiliqua</i> | western yellowcress | N | X | | X | X | |
| <i>Rorippa palustris</i> | | | | | | | |
| <i>Rosa multiflora</i> | many flowered rose | I | | | | | |
| <i>Rosa nutkana</i> | Nootka rose | N | X | | | | X |
| <i>Rosa sp.</i> | rose sp. | N/I | X | | X | | |
| <i>Rosa pisocarpa</i> | peafruit rose | I | | | | | |
| <i>Rubus armeniacus</i> | Himalayan blackberry | I | X | | X | X | X |
| <i>Rubus laciniatus</i> | evergreen blackberry | I | | | | | |
| <i>Rumex acetocella</i> | sheep sorrel | I | | | X | | |
| <i>Rumex conglomeratus</i> | clustered dock | I | | | X | | |
| <i>Rumex crispus</i> | curly dock | I | X | X | X | X | X |
| <i>Rumex salicifolius</i> | willow dock | N | X | X | X | X | |
| <i>Salix sp.</i> | willow | N | | | X | | |
| <i>Saxifraga integrifolia</i> | swamp saxifrage | N | | | | | |
| <i>Saxifraga oregana</i> | bog saxifrage | N | X | | X | X | |
| <i>Scirpus tabernaemontani</i> | softstem bulrush | N | | | | | |
| <i>Senecio jacobea</i> | tansy ragwort | I | X | | | X | X |
| <i>Senecio sylvaticus</i> | wood groundsel | I | | | | X | |
| <i>Senecio vulgaris</i> | old-man-in-the-spring | I | X | | | X | |
| <i>Sherardia arvensis</i> | blue field-madder | I | X | | | | |
| <i>Sidalcea cusickii</i> ssp. <i>purpurea</i> | Cusick's checker-mallow | N | X | | | X | |
| <i>Sidalcea virgata</i> | dwarf checker-mallow | N | X | | X | | |
| <i>Sisyrinchium bellum</i> | Western blue-eyed grass | N | | | | | |
| <i>Sisyrinchium hitchcockii</i> | Hitchcock's blue-eyed grass | N | | | | | |
| <i>Sisyrinchium idahoense</i> | Idaho blue-eyed grass | N | X | | X | X | X |
| <i>Solanum dulcamara</i> | bitter nightshade | I | | | | X | |
| <i>Solanum nigrum</i> | black nightshade | I | | | | | |
| <i>Sonchus asper</i> | prickly sow-thistle | I | X | | | X | X |
| <i>Sparganium emersum</i> | simplestem bur-reed | N | | | | | |
| <i>Spergula arvensis</i> | stickwort | I | | | | | |
| <i>Spergula rubra</i> | red sandspurry | I | | | | X | |
| <i>Spiraea douglasii</i> | Douglas spirea | N | | | X | | |
| <i>Spiranthes romanzoffiana</i> | hooded ladies tresses | N | | | | | |

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| | | Site | Dragonfly Bend | | Coyote Prairie | | |
|---|-------------------------|---------|----------------|--------|----------------|---|---------|
| | | Phase | 2 | upland | 1 | 2 | 2 |
| | | Section | | | | | Remnant |
| <i>Stellaria media</i> | chickweed | I | | | | | |
| <i>Symphoricarpos albus var. laevigatus</i> | snowberry | N | X | | | | |
| <i>Symphotrichum hallii</i> | Hall's aster | N | X | | | X | X |
| <i>Tanacetum vulgare</i> | common tansy | I | X | | | | |
| <i>Taraxicum officinale</i> | dandelion | I | | | | X | |
| <i>Toxicodendron diversiloba</i> | poison oak | N | | | | | |
| <i>Trifolium arvense</i> | rabbitfoot clover | I | X | X | | | |
| <i>Trifolium dubium</i> | least hop clover | I | X | X | | | X |
| <i>Trifolium pratense</i> | red clover | I | | X | | | |
| <i>Trifolium repens</i> | white clover | I | X | X | | | |
| <i>Trifolium subterraneum</i> | subterranean clover | I | X | | | | |
| <i>Trifolium vesiculosum</i> | arrowleaf clover | I | | | | | |
| <i>Triphysaria versicolor ssp. versicolor</i> | johnnytuck | N | | | | | |
| <i>Triteleia hyacinthina</i> | hyacinth brodiaea | N | | | | X | X |
| <i>Typha latifolia</i> | cat-tail | N | | | | X | |
| <i>Verbascum blattaria</i> | moth mullein | I | | | | | |
| <i>Verbascum thapsus</i> | common mullein | I | | X | | | |
| <i>Veronica americana</i> | American speedwell | N | | | | | |
| <i>Veronica peregrina</i> | purslane speedwell | N | X | | X | X | X |
| <i>Veronica scutellata</i> | marsh speedwell | N | | | X | | |
| <i>Vicia cracca</i> | bird vetch | I | X | X | | | X |
| <i>Vicia hirsuta</i> | hairy vetch | I | | | | | |
| <i>Vicia sativa</i> | common vetch | I | | | | | X |
| <i>Vicia tetrasperma</i> | slender vetch | I | X | X | X | X | X |
| <i>Vulpia bromoides</i> | barren fescue | I | X | X | X | X | X |
| <i>Vulpia myuros</i> | rat-tail fescue | I | X | X | X | X | |
| <i>Wyethia angustifolia</i> | narrow-leaf mule's ears | N | X | | X | X | X |
| <i>Zigadenus venenosus var. venenosus</i> | meadow death camas | N | | | | X | X |