Coyote Prairie

Mitigation Improvement Plan

May 2006

WEST EUGENE WETLANDS

Coyote Prairie

Mitigation Improvement Plan

Prepared for

City of Eugene • Parks and Open Space Division • Natural Resources Section

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1.0 Introduction

1.1 General Project Description

The 240.4-acre Coyote Prairie wetland mitigation site is located in the Coyote Creek drainage approximately one and a half miles to the west of Eugene. The site, which is owned by the City of Eugene (City), lies along the south side of Cantrell Road and is bisected by the East Branch of Coyote Creek. The Lane County Department of Assessment and Taxation identifies the property as tax lot 18-05-01-100.

The site has likely been in agricultural use since late 1800s or early 1900s, initially as pasture, and then cropped for grass seed production beginning in the early 1970s. In February 2006, the property was acquired by the City for wetland enhancement. The West Eugene Wetland mitigation bank will take the lead on enhancing the site over the next several years.

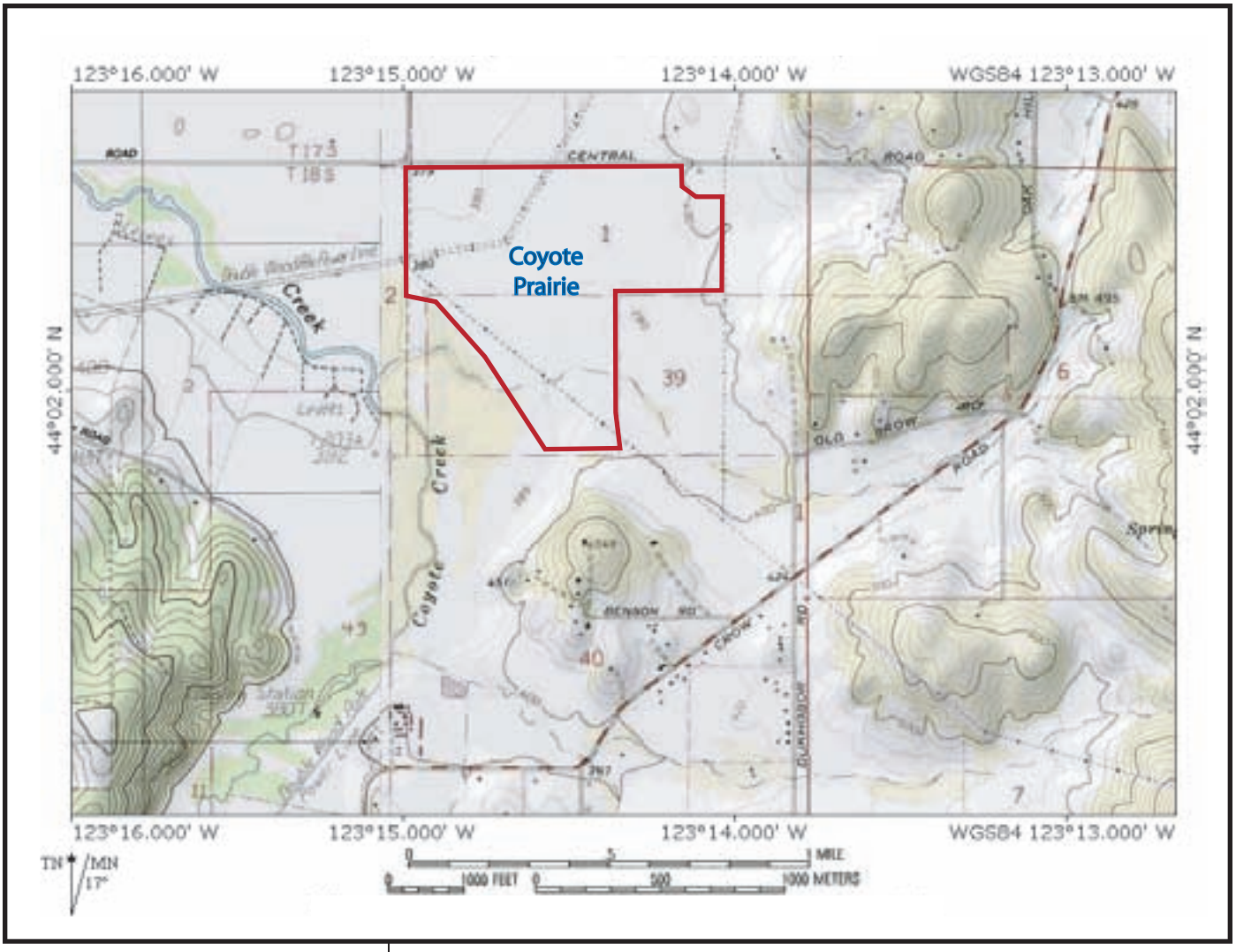
Most of the 240-acre Coyote Prairie site is currently in agricultural production for annual ryegrass.

An agricultural lease is currently in place allowing agricultural practices to continue until the planned wetland enhancement work is phased in. A local farmer currently leases the land from the City on a year to year basis.

The Action Plan for the site proposes enhancement of approximately 199.8 acres of wetland prairie, 14.7 acres of vernal pool, 0.9 acres of forested wetland, 0.4 acres of emergent wetland, and 1.0 acre of upland prairie along with associated management strategies that will help ensure long-term success of the proposed enhancement. The enhancement will be phased in over several years depending on Mitigation Bank needs, and will ultimately result in the creation of approximately 113.6 mitigation credits.

1.2 Site Context

Coyote Prairie lies within the Coyote Creek drainage basin approximately one and a half miles southeast of Fern Ridge Reservoir and approximately the same distance west of the City urban growth boundary (UGB). The East Branch of Coyote Creek passes through the site on its way to the main stem of Coyote Creek which lies 400 feet to the west. The site is predominately bordered by agricultural uses, primarily grass seed production, hay field, and pasture. A few widely scattered residential structures are situated on the hill slopes to the



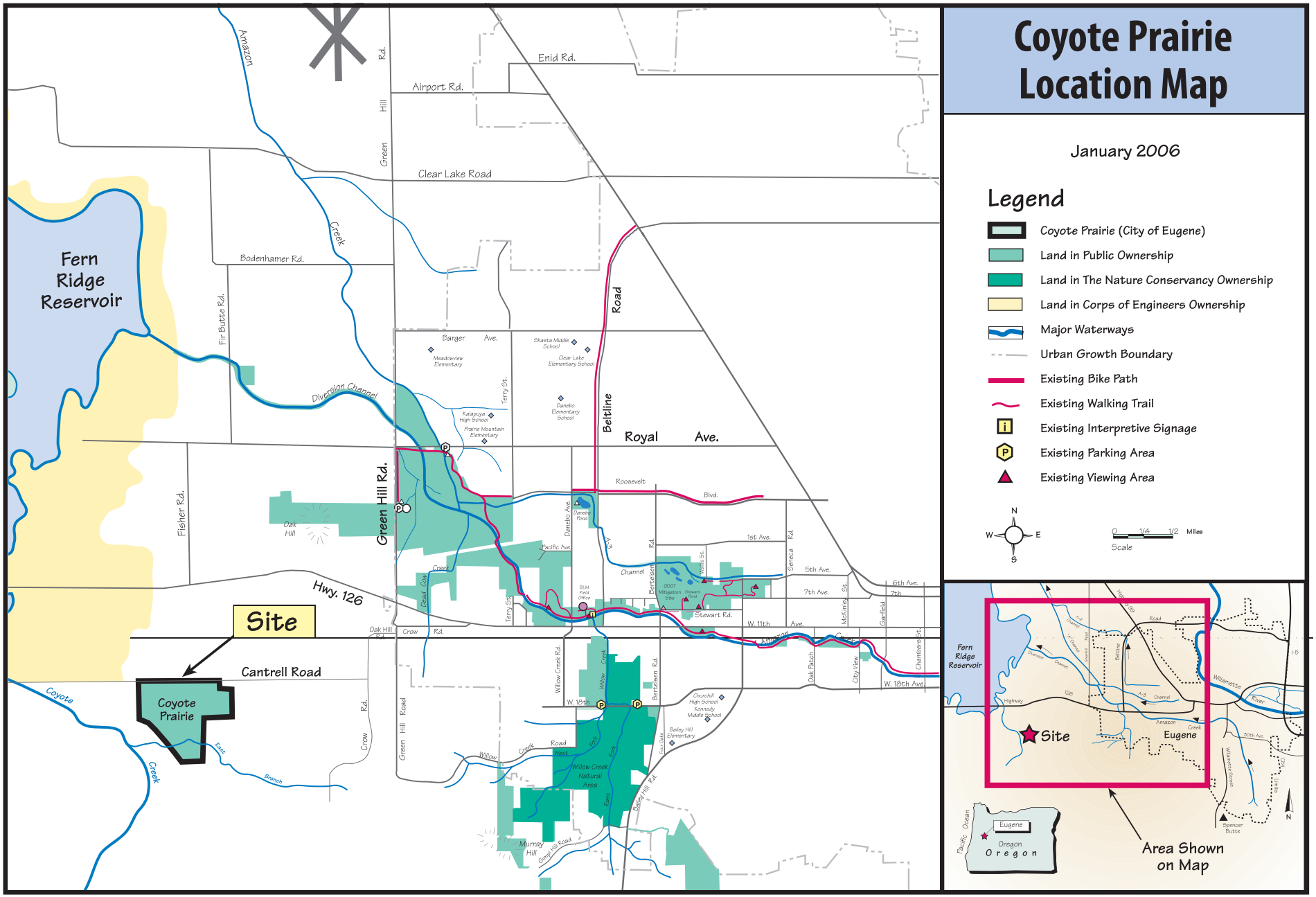
Coyote Prairie Context Map

east and south of the site. A forested property, consisting primarily of oak, ash, and associated understory species, borders the site to the southwest. All adjacent properties are currently in private ownership, although significant U.S. Army Corps of Engineers land holdings associated with Coyote Creek and Fern Ridge Reservoir lie just to the northwest (See Context Map and Existing Conditions Map).

With the surrounding lands situated well outside of the current UGB and zoned primarily for exclusive farm use, little additional residential development is expected. However, the passage of Ballot Measure 37 by Oregon voters in 2004 could potentially result in some increases in residential land development in the area over time. Measure 37 requires that state and local governments compensate property owners whenever a land use regulation reduces a property's value, or in lieu of payment, waive such regulation. With many legal challenges pending, it is difficult to determine exactly what Measure 37 will mean to the land use pattern in the area over the long-term.

1.3 Project Authority

This Mitigation Improvement Plan (MIP) will generate mitigation credit for the West Eugene Wetlands Mitigation Banking Program under the authority of a Memorandum of Agreement (MOA) between the U.S. Army Corps of Engineers (Corps), U.S. Environmental Protection


Coyote Prairie Location Map
January 2006
Legend
Coyote Prairie (City of Eugene)
Land in Public Ownership
Land in The Nature Conservancy Ownership
Land in Corps of Engineers Ownership
Major Waterways
Urban Growth Boundary
Existing Bike Path
Existing Walking Trail
Existing Interpretive Signage
Existing Parking Area
Existing Viewing Area
N
W
E
S
0 1/4 1/2 Miles
Scale
Fern Ridge Reservoir
Site
Cantrell Road
Coyote Prairie
Hwy. 126
Green Hill Rd.
Bethline Road
Royal Ave.
Clear Lake Road
Airport Rd.
Enid Rd.
Bodenhamer Rd.
Fisher Rd.
Fir Butte Rd.
Diversion Channel
Coyote Creek
East Branch
Willow Creek Natural Area
Murray Hill
Eugene
Oregon
Pacific Ocean
Area Shown on Map

Agency, Oregon Department of Environmental Quality, Oregon Division of State Lands, Bureau of Land Management (BLM), U.S. Fish and Wildlife Service, and the City. The Agreement, originally signed in 1995, activated the Mitigation Bank, which represents one product of a unique partnership between the City, The Nature Conservancy (TNC), the BLM, the Corps, Oregon Youth Conservation Corps, McKenzie River Trust, Willamette Resources Education Network (WREN), and the U.S. Fish and Wildlife Service. The partnership originated in 1992 with adoption of the *West Eugene Wetlands Plan* (WEWP) and the implementation of the Mitigation Bank as one of the Plan's goals.

2.0 Site History and Existing Conditions

2.1 Site History

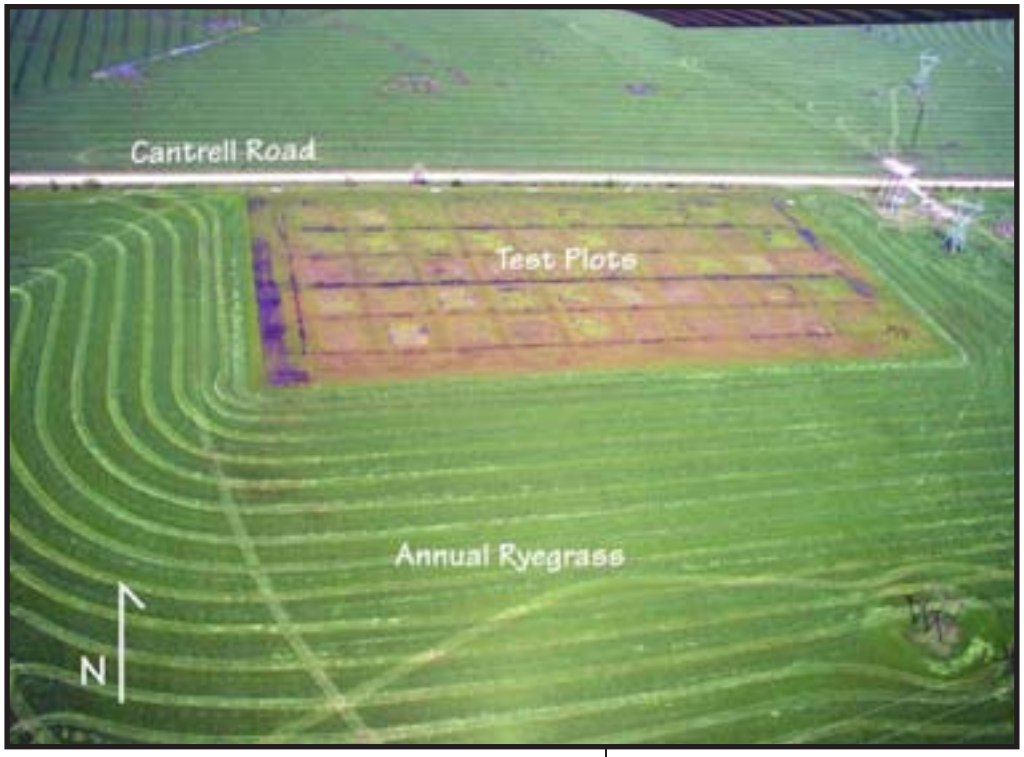
Based on interpretation of the Natural Resource Conservation Service (NRCS) Soil Survey Data (2006), and historic vegetation mapping (Christy et al. 1999 based on the General Land Office surveys of the 1850s), the site was most likely historically dominated by a wetland prairie plant community, with a small area of upland prairie on the very southern edge. This was part of a much larger expanse of upland and wetland prairie that historically covered much of the southern Willamette Valley, kept in that open state by periodic fires set by the native tribes including the Kalapuyans. The East Branch of Coyote Creek is mapped as wet prairie as it crosses the site and riparian forest just to the west as it nears the confluence with the main stem of Coyote Creek.

Sometime late 1800s or early 1900s, the site, along with much of the surrounding landscape, was converted to agricultural uses. Evidence of grazing on the site can be seen on the 1936 aerial photograph. The land remained untilled until it was converted to grass seed production in the early 1970s (personal correspondence with Jeff Heitzman, March 2006). As part of this conversion to grass seed, all but the southern twenty-five acres of the site was mechanically smoothed between the late 1970s and early 1990s, an agricultural practice that was common in the Willamette Valley. This smoothing is evident in the extremely uniform topography now present.

Annual ryegrass prior to grass seed harvest (May 2004)

2.2 Agricultural Practices

Since the early 1970s, the site has consistently been in grass seed production, which has included annual and perennial ryegrass and tall fescue. Most of the site is currently planted in annual ryegrass with the exception of approximately nineteen acres on the eastern edge of the property, which was planted with tall fescue in 2005. A total of 47.4 acres of the site have been removed from the agricultural lease agreement between the City and the leasing farmer, Jeff Heitzman, and are no longer in production. This includes the 12.2 acres housing the EPA test plots and the 35.2 acres of field and forest on the southern edge of the site.

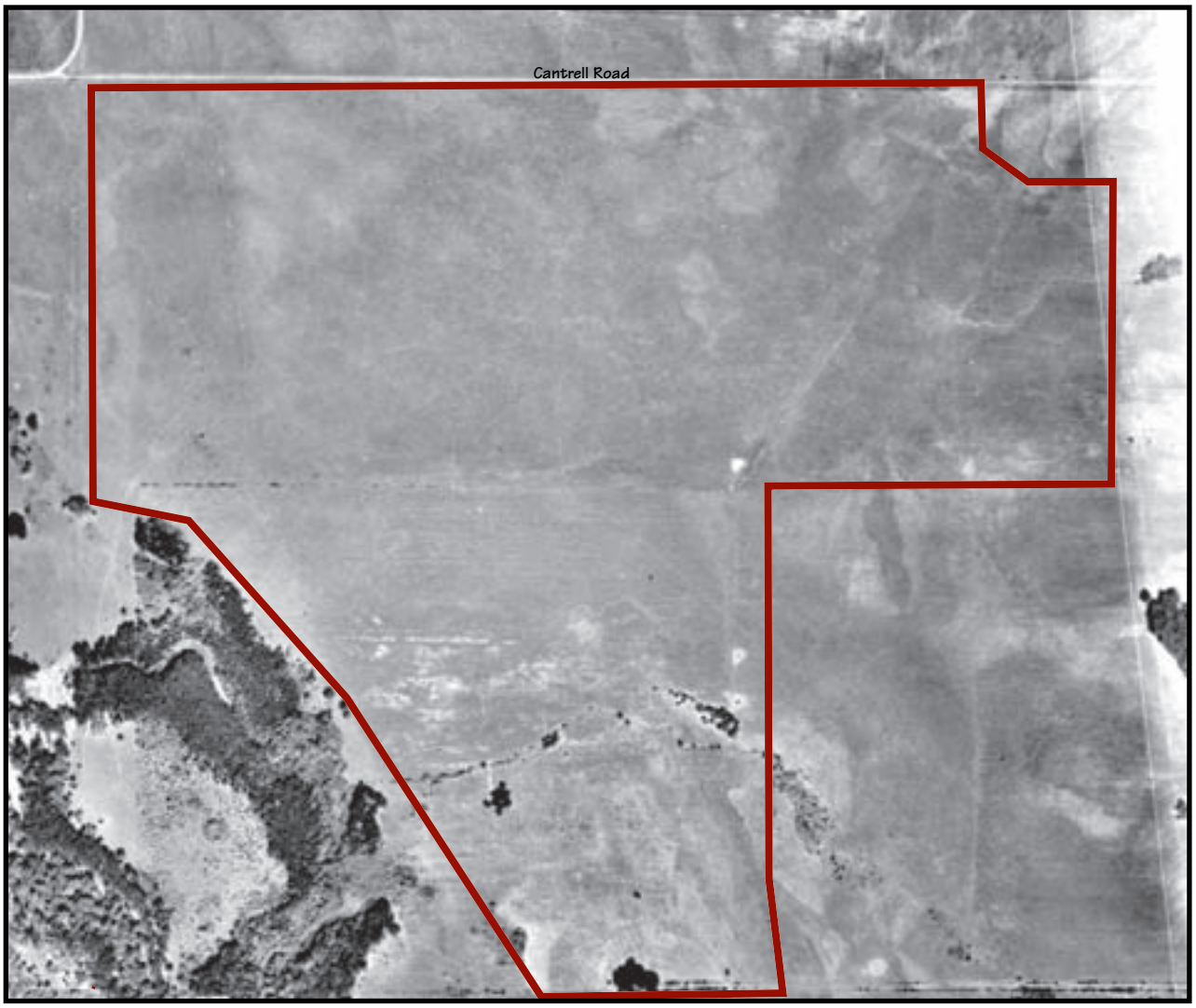


Much of Coyote Prairie is currently cropped for annual ryegrass. The wetland restoration experimental test plots are shown in the center of the photo adjacent to Cantrell Road.

Typical farming practices on the grass seed fields over the past several years have consisted of two applications of fertilizer at a rate of approximately 350 pounds per acres (late March and early April), crop harvest (June), burning to eliminate thatch and weeds (fall), and re-planting of annual ryegrass (fall of most years). In addition, various types of herbicide are applied across the site, as needed, to control weeds (personal correspondence with Jeff Heitzman, March 2006). This cycle of management has resulted in extremely pure fields with virtually no weeds present, a quality which is critical for successful commercial grass seed production. Winter grazing of sheep on portions of the site has occurred periodically over the years and as recently as December 2005. Grazing is not permitted under the current agricultural lease agreement.

Tall fescue was planted on 19.2 acres in the eastern portion of the site in 2005 (Coyote Swale shown in the foreground).

2.3 Aerial Photo Observations



Coyote Prairie
1936 Aerial Photo

Legend
Coyote Prairie Site Boundary

N
W E
S

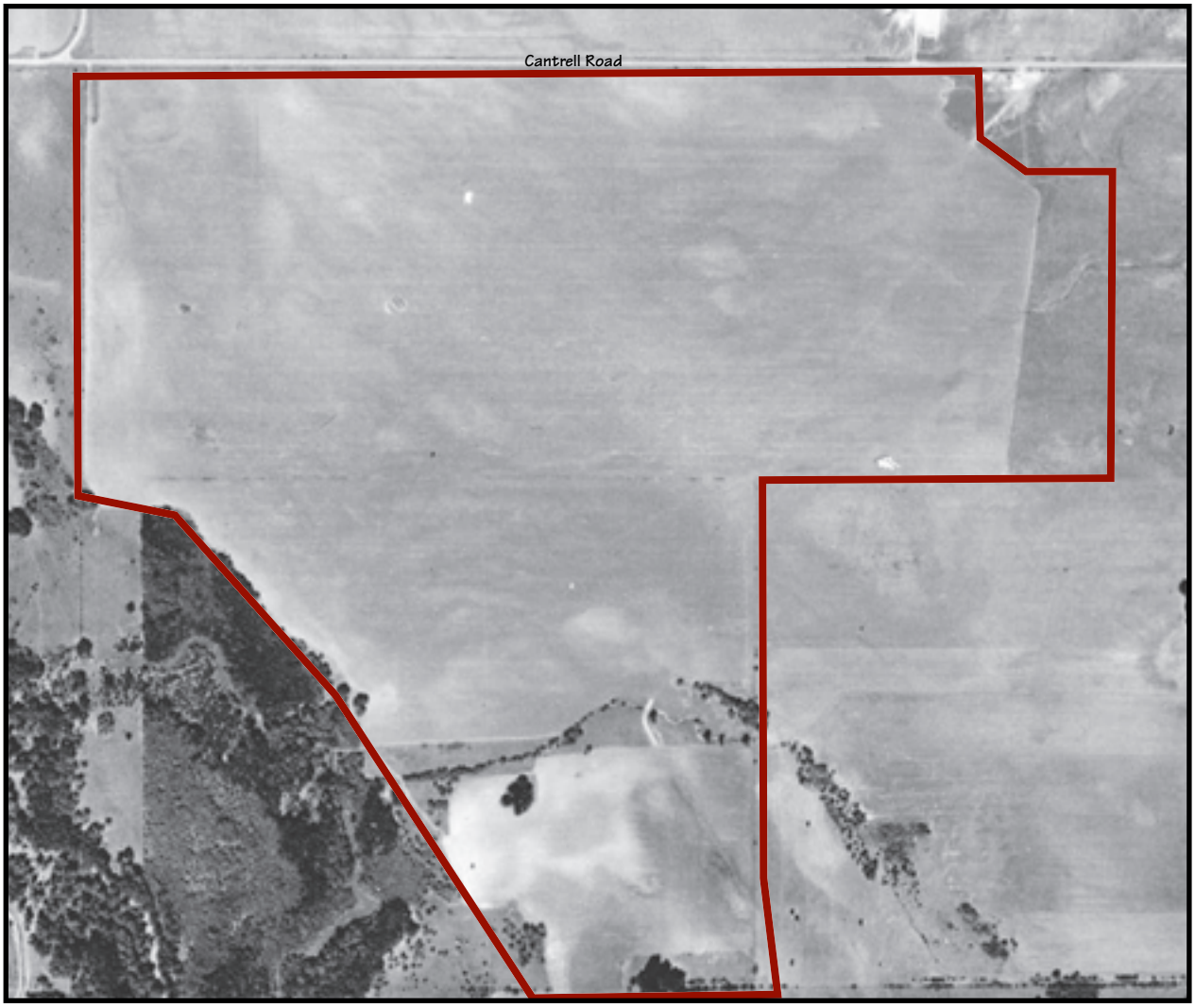
0 100 200 400 Feet
Scale

1936

- The site appears to be in use as pasture as is evidenced by the fence lines and cattle trails.
- Cantrell Road has been built and is in its current location.
- A somewhat undulating topography is evident across most of the site (variation in tone).
- Several trees (likely the larger oaks currently found on the site) are present on the very southern edge of the property.
- The East Branch of Coyote Creek is evident near its current location and some scattered trees are present along the waterway.
- The agricultural drainage (Coyote Swale) is not present.
- The land to the southwest (Tapp property) is forested. This indicates that the Coyote Prairie site would likely have been in a similar successional transition from open prairie to forest if it hadn't been managed for pasture.

1952

- The site continues to be in pasture and possibly hay field use. Although haying is not evident on the photo, this was a common practice in the area at the time.
- Additional trees are evident along the East Branch of Coyote Creek.
- A barn has been constructed adjacent to the northeast corner of the site (still present)
- The undulating topography is still evident.



Coyote Prairie 1960 Aerial Photo

Legend

Coyote Prairie Site Boundary

N W E S

0 100 200 400 Feet

Scale

1960

- The site still appears to be in active pasture use.
- Vegetation along the former fence line through the center of the site has mostly been removed.
- A crossing over the East Branch of Coyote Creek has been added (east of the current location).
- Woody vegetation is moving onto the southwestern edge of the site.
- The upper portion of the Coyote Swale drainage has been cut, although it only extends for a short distance across the eastern edge of the site.
- The undulating topography is still evident.

Coyote Prairie
1968 Aerial Photo

Legend
Coyote Prairie Site Boundary

N
W E
S

0 100 200 400 Feet
Scale

1968

- The site still appears to be in pasture use.
- Power pylons are now present across the northwestern and eastern edges of the site. The central power pylons have not been installed. Access roads adjacent to the pylons may indicate they are under construction or recently completed.
- An access road has been installed along a portion of the western edge of the site (it is still evident today).
- A new crossing has been put over the East Fork of Coyote Creek in its current location. The crossing shown on the 1960 aerial photo appears to have been removed.
- The undulating topography is still evident.

Coyote Prairie
1994 Aerial Photo

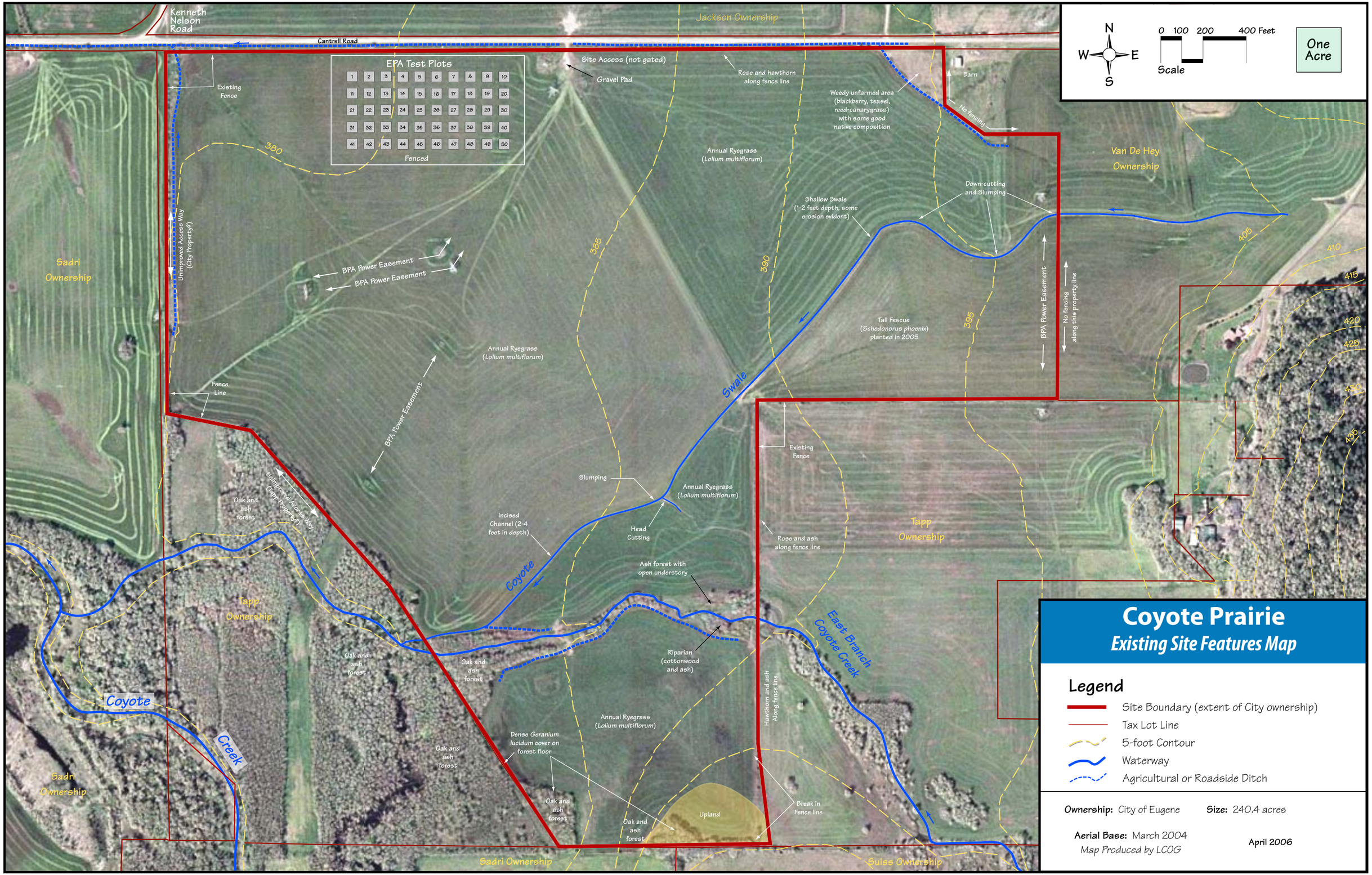
Legend
Coyote Prairie Site Boundary

N
W E
S

0 100 200 400 Feet
Scale

1994

- The site has been converted to grass seed production.
- The Coyote Swale drainage channel has been cut along the entirety of its current length.
- The agricultural drainages that parallel the East Branch of Coyote Creek are evident.
- The undulating topography is less evident than in the previous photos. All except the southern portion of the site appears to have been mechanically smoothed in the period prior to 1994 (confirmed through personal correspondence with Jeff Heitzman, March 2006).
- The final set of power lines have been installed across the site.
- The gravel parking pad along Cantrell Road has been installed in its current location.
- Several large trees in the southern portion of the site have been removed.



Coyote Prairie
Existing Site Features Map

Legend

- Site Boundary (extent of City ownership)
- Tax Lot Line
- 5-foot Contour
- Waterway
- Agricultural or Roadside Ditch

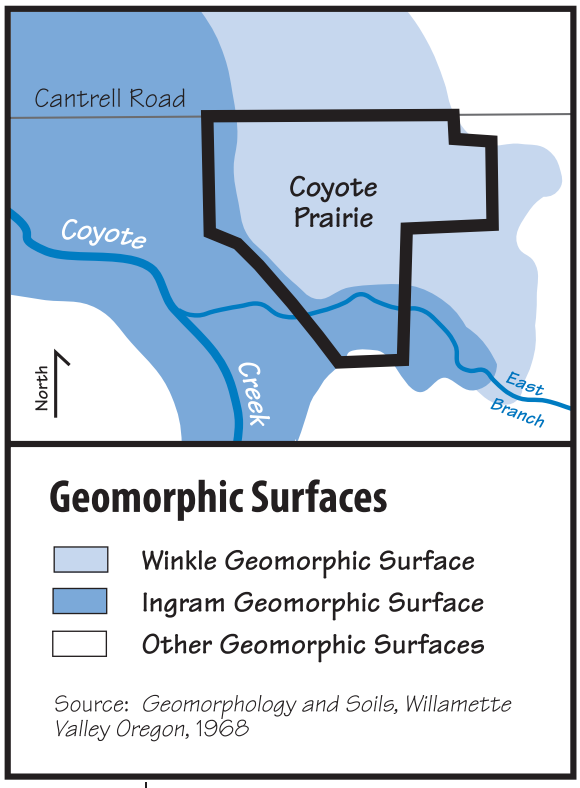
Ownership: City of Eugene **Size:** 240.4 acres

Aerial Base: March 2004
Map Produced by LCOG

April 2006

2.4 Geomorphology

A geomorphic surface is a distinct area that has a common history, is of similar age, and is formed by a set of processes during an episode of landscape evolution. Coyote Prairie has two mapped geomorphic surfaces (C.A. Balster and R.B. Parsons, 1967). The predominant area is the Winkle surface, which covers the northeastern two thirds of the site. This surface is typically an abandoned floodplain area and often displays signs of a past braided channel systems, which was created during flood events. This subtle relief is often reflected as a gradually undulating surface, which is evident in historic aerial photos of Coyote Prairie. The second mapped geomorphic area is the Ingram surface, which is shown to cover the western and southern edges of the site (see Geomorphology Map). The Ingram surface is characterized by low relief, undulating topography, and active floodplain, which in this case is associated with the East Branch of Coyote Creek. During flood events, the lower lying areas of the Ingram geomorphic surface become inundated, while the higher points remain above flood level. This undulating surface is still evident on the site, and portions of this area were inundated during the January 2006 flood event.



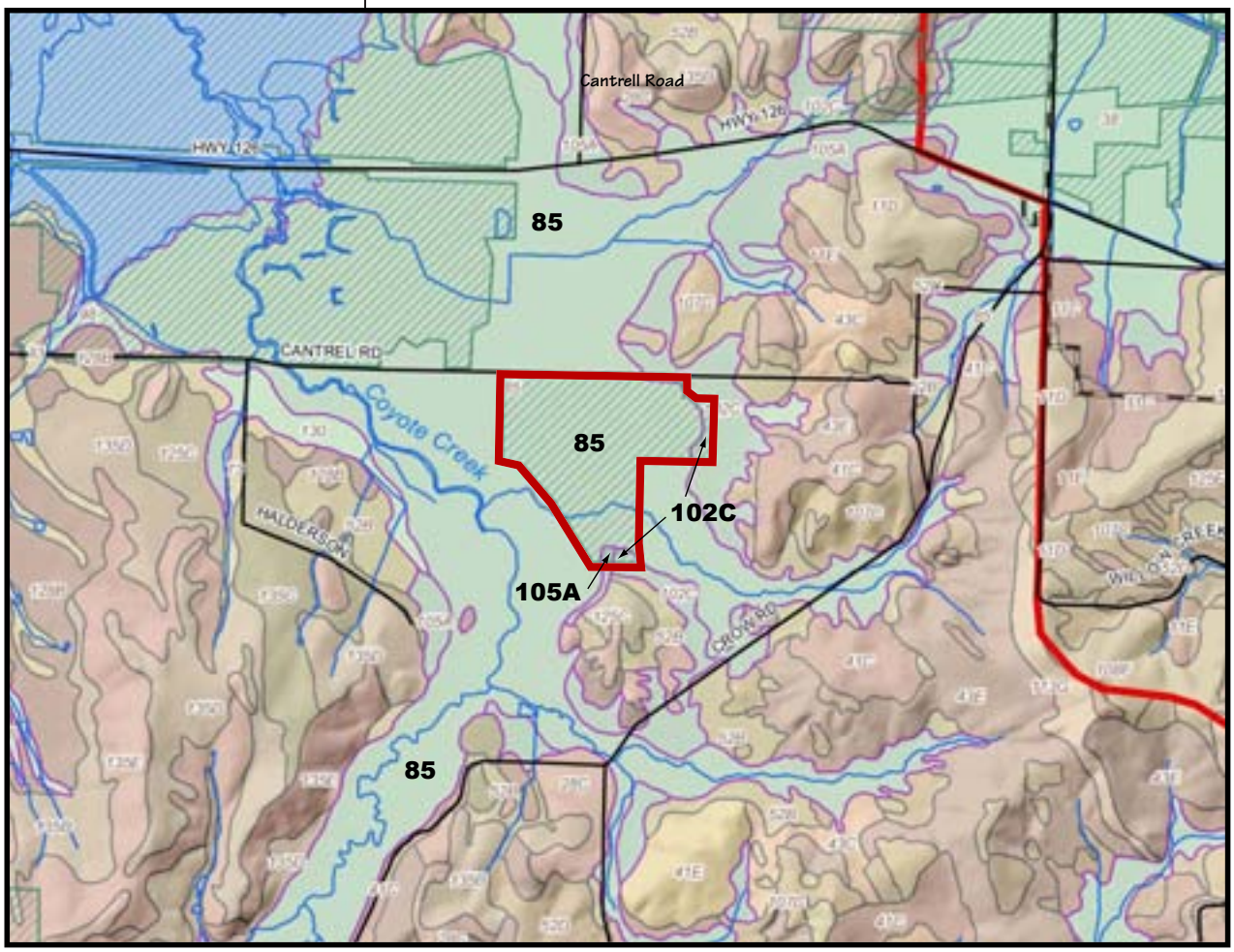
2.5 Soils

Based on the NRCS Soil Survey of the area, the majority of the site is mapped as Natroy silty clay loam, which is part of a much larger swath of this soil type mapped along the Coyote Creek basin bottom and throughout much of west Eugene. A smaller area of Panther silty clay loam is mapped along the very southern and eastern edges of the site (see Soils Map next page). Both of these soils are categorized as hydric by the NRCS.

Natroy silty clay loam is a deep, poorly drained soil often located along drainageways and other depressional areas on terraces or fans. It formed in mixed, fine-textured alluvium. Typically, the surface layer is a dark grayish brown silty clay loam about 5 inches thick with a layer of dark gray clay about 21 inches thick below. The substratum to a depth of 60 inches or more is a dark grayish brown clay and gravelly clay. Natroy soil is usually found in areas with slopes of less that two percent.

Panther silty clay loam is a deep, poorly drained soil often found on benches of foothills adjacent to valley of the Willamette River and its tributaries. It formed in colluvium and residuum derived from sedimentary and igneous rock. Typically, the surface layer is very dark brown silty clay loam about 10 inches deep with a dark grayish clay layer about 19 inches thick. It usually forms in areas with slopes of between two and twelve percent.

Sediment deposits were evident adjacent to East Branch of Coyote Creek following the January 2006 flooding.



Coyote Prairie Soils Map

N
W E
S

Based on NRCS
Soil Survey Data (2005)

Legend

- Coyote Prairie Site Boundary
- Hydric Soil Type
- Non-Hydric Soil Type

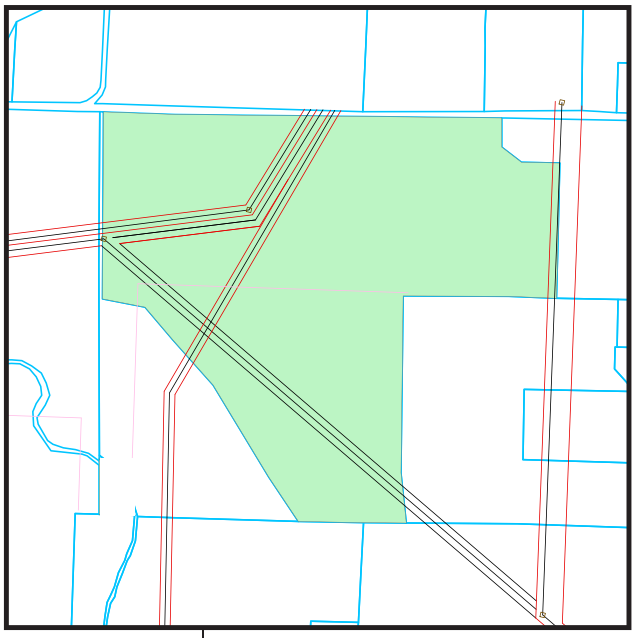
85 = Natroy silty clay loam
102C = Panther silty clay loam
105A = Pengra silty loam

Periodic plowing and disking over the past several decades has likely disturbed the "A" soil horizon across most of the site. This artificial "fluffing" of the soil surface has created a more uniform topography and has likely increased permeability of the soil slightly. Discontinuation of disking will allow the natural process of soil compaction and settling to occur and may make the remaining historic topographic variations more evident.

2.6 BPA Easements

A total of four Bonneville Power Administration (BPA) utility easements cross the site in various locations (see Existing Conditions Map). Three of these easements currently carry electrical transmission lines, which are suspended from large power pylons. Based on historic aerial photo interpretation, the eastern and western most power lines were installed

between 1960 and 1968, with the central power line installed sometime between 1968 and 1994. A fourth power easement crosses the southwest portion of the site at an angle, but currently does not carry power lines, although lines appear on the 1968 aerial photo, but were removed sometime before 1994 (see Utility Easement Map).



Utility Easement Map

As is the case with most BPA easements, structures are not permitted, but access must be granted at any time for repair. There are currently no restrictions to farming and enhancement activities within these easements.

2.7 Surface Hydrology

Two waterways currently cross the Coyote Prairie site. The southern most and largest is referred to in this report as the East Branch of Coyote Creek. This waterway, which drains a basin approximately 1,300 acres in size, is presumed to be a natural feature, and follows a meandering path from east to west on its way to the main branch of Coyote Creek, which lies 400 feet to the west. The creek is evident in its current location on the 1936 aerial photo. A second smaller waterway, 3,800 feet in length, was constructed as an agricultural drainage sometime between 1968 and 1994. This feature, which is referred to in this report as Coyote Swale, is extremely straight and flows from the Van De Hay property to the east and into the East Branch of Coyote Creek. Much of the upper half of this agricultural drainage is currently very shallow (less than one-foot in depth) with gradual sloping banks, although some erosion is present. However, the lower 1,800 feet of channel is quite incised and is between two- and four-feet in depth and about the same in width. Little vegetation lines the channel and slumping is occurring in numerous locations. Based on the location of this agricultural drainage and the relative overall flatness of the site, it is probably having minimal affect of modifying the surrounding surface hydrology. Neither of these waterways are perennial and both are dry by early summer (based on

Wet prairie and vernal pool hydrologic conditions (January 2006)

The northwest corner of the site is the wettest, with emergent and vernal pool conditions present (January 2006)

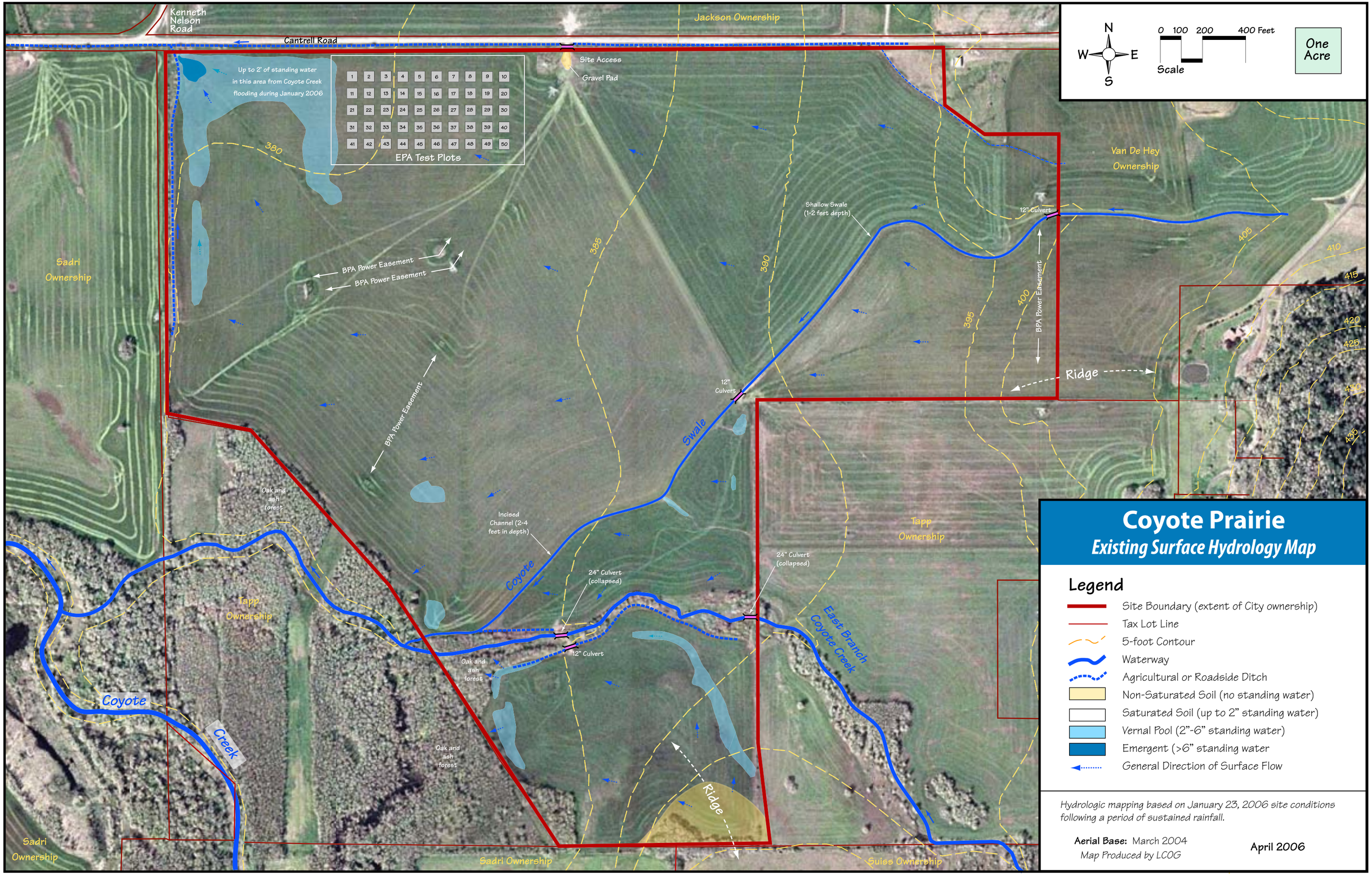
Coyote Swale (agricultural drainage)

2005 field observations). Several smaller agricultural or roadside ditches are also found on the site. These are located along Cantrell road, along the access way on the site's western edge, and parallel to the East Branch of Coyote Creek.

Based on field observations taken in December 2005 and January 2006, the surface hydrology across most of the site consists of saturated soils or standing water of up to two inches in depth. This surface water generally sheet flows down gradient from east to west. Pockets of deeper water exist primarily along the western edge of the site and in the field to the south of the East Branch of Coyote Creek. These pockets of standing water were observed to be between three and twelve inches in depth and mainly fall on the portions of the site mapped with the Ingram geomorphic surface. The driest areas are found along the very southern and eastern edges of the site where the toe slopes of the adjacent hills transition to the flat valley bottom and the gradient is somewhat steeper. The soils in these areas, although dryer than the rest of the site, were still saturated or near saturated at the time the hydrology was mapped in January 2006 (see Existing Surface Hydrology Map).

Most of the site has a very low gradient with slopes as shallow as 0.2 percent on the eastern half of the site. The slopes are a bit steeper on the far eastern and southern portions of the site, with a maximum gradient of 3.3 percent found along the very southern edge.

Although not mapped as being within the 100-year floodplain, the northwest corner of the site, as well as the area immediately adjacent to the East Branch of Coyote Creek, experienced significant flooding (up to two feet in depth) related to the over banking of Coyote Creek and roadside ditches during the January 2006 flood. This flood was thought to be a two-year event.



Coyote Prairie
Existing Surface Hydrology Map

Legend

- Site Boundary (extent of City ownership)
- Tax Lot Line
- 5-foot Contour
- Waterway
- Agricultural or Roadside Ditch
- Non-Saturated Soil (no standing water)
- Saturated Soil (up to 2" standing water)
- Vernal Pool (2"-6" standing water)
- Emergent (>6" standing water
- General Direction of Surface Flow

Hydrologic mapping based on January 23, 2006 site conditions following a period of sustained rainfall.

Aerial Base: March 2004
Map Produced by LCOG

April 2006

2.8 Wetland Delineation

In March 2006, Nancy Holtzhauser of Environmental Solutions, LLC preformed a wetland delineation for the entire site using the Hydrogeomorphic (HGM) based assessment method developed by the DSL (Adamus and Field, 2001). With the exception of approximately 2.3 acres in the southeastern corner of the property, the entire site was determined to be wetland. During the delineation, soils across the site were found to exhibit hydric soil characteristics including a chroma of one and/or mottling in the top ten inches (with the exception of the three acres in the southwest corner). Soils were consistently a silty clay loam between three and twelve inches deep over a denser loamy-clay or clay layer, which reduces permeability and causes a shallow perched water table to form and create wetland hydrologic conditions.

A portion of the *Wetland Function Assessment Report* is included in Appendix-A. The complete report is available upon request.

Table 2-1

Wetland Delineation Results	Acres
Agricultural Wetland	218.9
Experimental Plots (Wetland)	12.0
Ash Forest Wetland	4.7
Rose/Ash Scrub-Shrub Wetland	2.1
Total Wetland:	**237.7**
Agricultural Upland	1.3
Oak Woodland (Upland)	1.0
Total Upland:	**2.3**

2.9 Existing Vegetation

The vast majority of the Coyote Prairie site is currently in cultivation for annual ryegrass (*Lolium multiflorum*), with a smaller area of tall fescue (*Schedonorus phoenix*) located on approximately 19.2 acres on the eastern portion of the site. These agricultural fields are very clean and are virtual monocultures of the planted crop.

Oak and ash forest can be found in the southern end of the site.

Eleven acres of the site adjacent to Cantrell Road are currently being used for EPA funded wetland restoration site preparation study underway since 2004. This area contains fifty experimental plots which were planted in 2004 with sixteen species of native wet prairie grasses and forbs along with buffer areas which have been planted with three species of native wet prairie grass species.

Geranium lucidum

The southern portion of the site does contain some diversity in addition to annual ryegrass, including approximately 2.6 acres of ash and oak forest and approximately 5.9 acres of riparian forest along the East Branch of Coyote Creek. The riparian forest includes significant quantities of Oregon ash (*Fraxinus latifolia*), Oregon Oak (*Quercus garryana* var. *garryana*), and several large black cottonwood (*Populus balsamifer*) snags. The understory consists of thick nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), Indian plum (*Oemleria cerasiformis*), cow parsnip (*Heracleum lanathum*), rush (*Juncus* spp.), and some relatively small pockets of Armenian blackberry (*Rubus armeniacus*). The ash and oak forest is dominated by Oregon ash (*Fraxinus latifolia)* and Oregon Oak (*Quercus garryana* var. *garryana*). A number of the oak are very large and appear on the 1936 aerial photo. A few small Douglas fir (*Pseudotsuga menziesii*) are beginning to colonize the forest. The understory shrub layer is similar to what is found in the riparian forest, but not as dense. However, large portions of the forest floor in these areas is covered with a thick mat of highly invasive *Geranium lucidum*, which appears to be spreading readily. Patches of *Camas quamish* are also present, but not common.

East Branch Coyote Creek

Along the perimeter of much of the site, mainly associated with fence lines, scrubby vegetation including hawthorn, rose, pear, and ash has begun to establish. Pennyroyal (*Mentha pulegium*) has not been observed on the site, but pockets are evident on the Tapp property immediately to the east and up-gradient of the site. A triagular shaped area in the northeast corner of the site is unfarmed and very weedy and contains several species of noxious weeds including blackberry (*Rubus armeniacus)*, reed canarygrass (*Phalaris arundinacea*), tall fescue tall fescue (*Schedonorus phoenix*), and teasel (*Dipsacus fullonum*).

2.10 Existing Wildlife

There have been no formal wildlife surveys conducted on the site. However, informal wildlife observations since 2004 include coyote, elk, Northern harrier, Western meadowlark, Canada Geese, and Pacific tree frog.

2.11 Rare Plants and Animals

With the extensive agricultural practices over the past three decades, there limited potential for the presence of rare plants across much of the site. However, in May 2006, seven *Lomatium bradshawii* (State and Federal endangered species status: *Endangered*) plants were

discovered by a WEW Partner botanist in an uncultivated area in the northeast corner of the site. Another *Lomatium bradshawii* population is also know to exist near the site along the Kenneth Nielson Road right-of-way and is currently being managed by Lane County. The forested areas on the southern end of the property were also surveyed for the presence of rare plant species in May 2006 and none were found. Western meadowlark, (State endangered species status: *critical*), have been sighted in the area of the test plots in 2005. It is unlikely that the Western pond turtle inhabits the site due to the seasonal nature of the waterways.

2.12 Previous Site Planning Efforts

This Mitigation Improvement Plan is the first enhancement planning effort known to have been undertaken for the site. Some limited site assessment has been conducted in conjunction with the EPA and City funded wetland site preparation study, which is occurring on 11 acres of the site adjacent to Cantrell Road. This research is described below and is expected to continue over the next several years. Based on conversation with long time property owner, C.W. Peters, two *water guzzlers* were placed in the vicinity of the East Branch of Coyote Creek by the Works Progress Administration (WPA) in the late 1930s. This would indicate some past wildlife habitat enhancement efforts. No trace of the *water guzzlers* have yet to be found.

One of the fifty experimental test plots located at the northern edge of the site (solarization plot shown)

2.13 Experimental Test Plots

With the support of an EPA Wetland Development grant and matching funds from the City of Eugene, the West Eugene Wetland Partnership is now on the third year of a study that is looking at the effectiveness of various wetland prairie restoration site preparation techniques. The study is titled: *Testing the Effectiveness of Various Site Preparation Techniques for Wetland Prairie Restoration*. Lane Council of Governments is managing the grant for the WEW Partnership and is working with a consultant team from the University of Oregon. The goal of this research is to provide new information on the effectiveness of various site preparation techniques, not only for the WEW Partners, but also for wetland prairie practitioners throughout the Willamette Valley and elsewhere in the nation.

A total of 50 experimental plots and associated buffer areas are located on 11 acres of the Coyote Prairie site, immediately adjacent to Cantrell Road (see Existing Site Features Map). This area is fenced to avoid accidental impacts from the ongoing adjacent agricultural practices. The buffer area has been planted with native grass species to prevent erosion and limit weed colonization and is mowed several times per year. Each of the 50 experimental plots was seeded with sixteen species of native grasses and forbs in 2004 and is monitored on a seasonal basis.

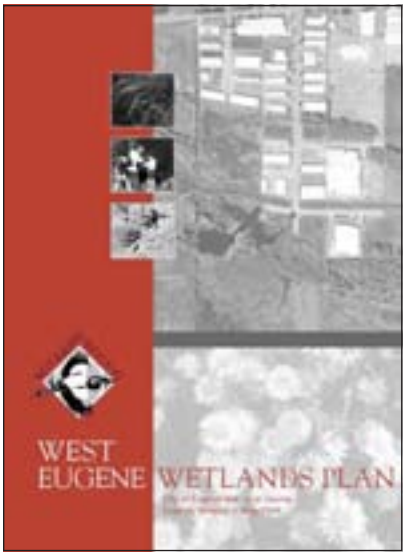
Culverted crossing of Coyote Swale

2.14 Existing Site Access

Vehicular access to the vast majority of the site is difficult if not impossible during most of the wet season and can generally not be guaranteed any time between November and May. The leasing farmer is able to access portions of the site during the winter with a *four-wheeler*, although even this vehicle becomes stuck at times. An unimproved access way leading from Cantrell Road runs for 1,200 feet along the eastern edge of the property and remains fairly dry during the winter and would likely be passable by a light four-wheel drive vehicle. A gravel parking pad is located along Cantrell Road and is sufficient to support several vehicles in all seasons.

2.15 West Eugene Wetlands Plan Policy

Although not specific to the Coyote Prairie site, the West Eugene Wetlands Plan (1992) does provide some general guidance for restoration and enhancement of the site. Key policy from the Plan related to mitigation includes:



- Policy 4.1: Mitigation efforts shall help to reestablish a connected system of wetlands, waterways and upland resources.
- Policy 4.2: To insure long-term success, mitigation efforts shall give priority to establishing or reestablishing the basic hydrologic conditions necessary to meet the stated mitigation objectives.
- Policy 4.3: Mitigation efforts shall concentrate on restoring wetland type, habitat, functions and values that represent the historic, ecological landscape of the Amazon Creek basin.
- Policy 4.4: Mitigation efforts shall use local, native plant species.
- Policy 4.5: Mitigation efforts shall be designed and constructed to minimize the level of on-going maintenance.
- Policy 4.7: Mitigation projects will occur within the area of the Long Tom River watershed and its tributary streams.
- Policy 4.8: Historic wetlands and disturbed agricultural wetland sites are the preferred areas for mitigation projects.
- Policy 4.11: Require all mitigation efforts to participate in a comprehensive monitoring and maintenance program.
- Policy 4.16: Enhancement of existing wetlands can be used to add functional credits to the wetland mitigation bank.

3.0 Project Actions

3.1 Overview

The principal goal of the Coyote Prairie Mitigation Improvement Plan (MIP) is the re-establishment of a mosaic of wet prairie, upland prairie, emergent wetland, and vernal pool habitats that likely existed across the site prior to agricultural conversion. With the implementation of the proposed Action Plan, the dominant habitat type for the 240-acre site will be by far, wet prairie, with pockets of wetter vernal pools and emergent wetlands scattered across the site, and a patch of upland prairie situated on the dryer southern edge. In conjunction with the proposed enhancement, approximately 3,800 lineal feet of agricultural drainage (Coyote Swale) will be enhanced and stabilized, and over the long-term will likely be re-configured to create a shallow swale lined with native emergent and wet prairie vegetation. In addition, the Action Plan prescribes management actions for the forested riparian areas along the East Branch of Coyote Creek and for the forested wetland and upland patches along the southern fringe of the site. The primary objectives for the forested areas is the preservation of existing habitat and the control of invasive vegetation. Implementation of the proposed Action Plan will begin in summer 2006 with the 31.2 acre first phase, and will continue to be phased in over the next several years as outlined in the MIP (see Phasing Map). The amount of enhancement implemented each year will be dependant on Mitigation Bank needs and available resources, but will likely be between 30 and 40 acres per year. During implementation, active farming will continue on those areas not yet restored, and the agricultural lease on the property will be renewed on a yearly basis.

The proposed wetland enhancement will result in a mix of wet prairie, vernal pool, and emergent habitats based on existing hydrologic condition.

Mitigation bank credits will ultimately be requested for a total of approximately 227.1 acres of wetland enhancement. This will include the enhancement of approximately 199.8 acres of wet prairie, 14.7 acres of vernal pool wetland, 0.9 acres of forested wetland, 0.4 acres of emergent wetland, and 11.3 acres of buffer wetland (mainly in the wet prairie zone). At a 2:1 credit ratio, the proposed enhancement will ultimately produce approximately 113.6 wetland mitigation credits.

3.2 Wetland Enhancement

The majority of the area proposed for wetland enhancement is currently in cultivation for grass seed production for annual ryegrass (*Lolium multiflorum*) and tall fescue (*Schedonorus phoenix*). An additional twelve acres currently being used to accommodate the fifty test plots and their associated buffer areas will eventually be restored as wet prairie, most likely in the final phase. The proposed enhancement approach for these areas is outlined starting on page 27, but may be modified from phase to phase based on specific site conditions and the success of the early phases. In addition, the area where *Lomatium bradshawii* is know to exist will receive special management treatments to preserve and expand the exiting population.

Coyote Prairie Enhancement Goals

Habitat Goals

- Re-establish a mosaic of vernal pool, wet prairie, and upland prairie habitats that likely existed in this area prior to agricultural conversion.
- Enhance the existing forest habitat where it currently exists.
- Enhance the existing riparian habitat along the East Fork of Coyote Creek and expand the width of the riparian zone where it is lacking.
- Enhance emergent, vernal pool, and wet prairie habitat in and along Coyote Swale.
- Enhance habitat conditions to be more suitable for native wildlife species associated with a wetland/upland prairie system such as western meadowlark, short-eared owl, Northern harrier, savanna sparrow, camas pocket gopher, gray-tailed vole, Roosevelt elk, chorus frog, garter snake, gopher snake, and Fender's blue butterfly.
- Over the long-term, enhance the habitat structure within the prairie by creating several shrub islands within the larger expanses of prairie.
- Manage the portion of the site where *Lomatium bradshawii* is present to preserve and expand the existing population.

Access Goals

- Provide site access for enhancement, maintenance, and monitoring activities.
- Allow for continued access to the BPA power lines as needed for maintenance activities.
- Prevent unauthorized vehicular access onto the site.
- Limit formal public access to the site to prevent possible conflict with ongoing agricultural practices and enhancement activities.
- Designate preferred access routes or corridors onto the site to be used by vehicles and equipment related to enhancement and farming practices in order to concentrate impacts such as compaction.
- Coordinate enhancement and maintenance activities with the leasing farmer to allow agricultural practices to continue over the short-term and to prevent potential conflicts.

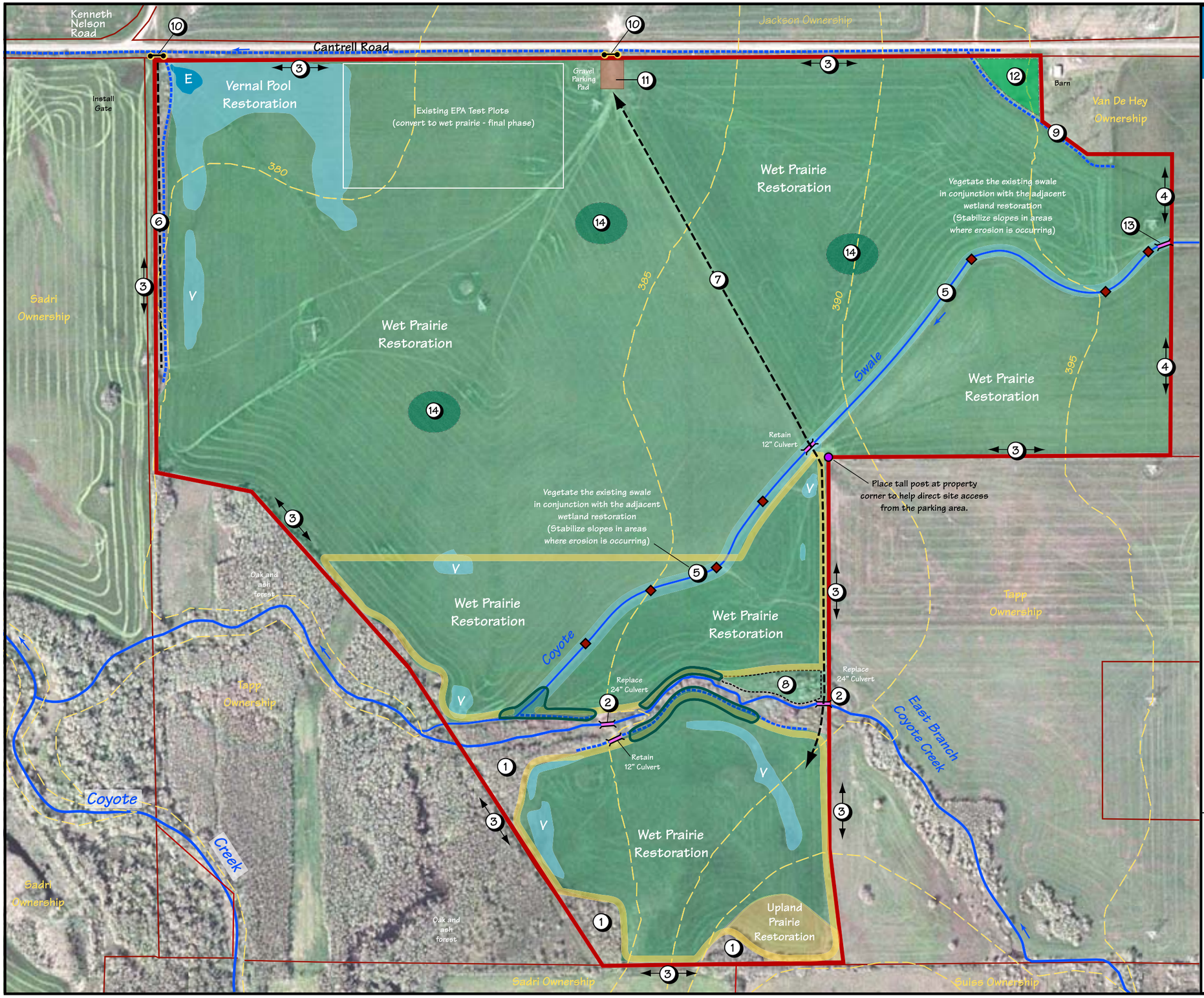
Hydrology Goals

- Maintain the existing wetland hydrology where it exists across the site.
- In the short-term, stabilize the Coyote Swale agricultural drainage to limit further erosion. Over the long-term, enhance the swale, creating a gradual transition from wetland prairie to emergent wetland.

Maintenance Goals

- Control invasive exotic plant species along the fringes of the site and forested areas to prevent their spread into the areas proposed for enhancement.
- Maintain and install wildlife friendly fencing along the perimeter of the site to define the property boundary and install temporary fencing along the perimeter of enhancement areas to avoid accidental impacts from ongoing farming activities.
- Maintain or replace culverts where they exist to allow vehicles and equipment to access to the site as needed for farming, enhancement, and maintenance activities.
- Maintain prairie habitats over the long-term through a combination of mowing and burning.

Coyote Prairie
Draft Action Plan Map



Legend

- Site Boundary (extent of City ownership)
- Tax Lot Line
- 5-foot Contour
- Waterway
- Agricultural or Roadside Ditch (retain)

Action Plan Key

- Wet Prairie Restoration
- V — Vernal Pool Restoration
- E — Emergent Wetland Restoration
- Upland Prairie Restoration (non-mitigation)
- Buffer Planting (only shown for phases I and II)
- Widen Riparian Edge over time
- Erosion control (coir waddles and matte)

1. Remove blackberry, pear, and Douglas fir where they occur; control geranium to prevent it's spread into restoration areas
2. Replace existing culvert
3. Retain fence line (improve where necessary)
4. Install wildlife friendly fencing on property boundary once the adjacent restoration work is completed
5. Re-contour ditch to create a shallow swale; stabilize with jute and plant with native emergent/vernal/prairie grasses and forbs
6. Retain access way and improve as need
7. Designated access route (unimproved)
8. Retain male ash and restore wetland prairie plant community under the trees
9. Retain agricultural drainage in the short-term to prevent weed seed from washing onto the site.
10. Install gate to control access
11. Retain and improve gravel parking pad
12. Enhance wet prairie, while preserving existing native plant component (control exotic vegetation)
13. Remove culvert during channel enhancement
14. Establish small islands of shrubs over long-term

N W E S

0 100 200 400 Feet
Scale

One Acre

Ownership: City of Eugene **Size:** 240.4 acres

Aerial Base: March 2004
Map Produced by LCOG

May 2006

3.2.1 Enhancement Technique

Because of the extensive seed bank of annual ryegrasss (*Lolium multiflorum*) on the site, and the desire to minimize any activation of the seed bank through soil disturbance, a no-till site preparation strategy will be implemented. No-till site preparation has already been shown to be successful at the Dragonfly Bend Mitigation Bank Site in the West Eugene Wetlands, as well as through scientific research on the nearby EPA test plots on this site.

A no-till site preparation technique, herbicide application, will be the primary site preparation technique used.

The first step in the no-till site preparation strategy for the wetland prairie, vernal pool, and emergent wetland enhancement will involve the eradication of the existing, non-native vegetation through multiple applications of a broad spectrum herbicide during the first year of implementation. The site preparation will be modified in the area containing the *Lomatium bradshawii* population in order to avoid harming the plants.

Following the site preparation, native wetland forb species will be planted in the fall of the first year. In the fall of the second year, native grasses will be seeded into the enhancement area along with some supplemental forb plantings. Based on the success of past Mitigation Bank projects (e.g. Dragonfly Bend), exclusively planting forbs in the first year allows these species to better establish before the more aggressive native grasses are introduced. This technique also allows for the use of a grass specific herbicide during the first year of enhancement if exotic grasses are still present in large quantities. The native forbs and grasses will be planted primarily as seed using a broadcast seeder to minimize soil disturbance. Additional planting of forb plugs and bulbs, along with bare-root *Juncas* spp. and *Carex* spp., may be also be used to help supplement the first round of seeding.

Native forbs will be planted in year one and native grasses in year two using a broadcast seeder (pictured above). Plugs, bulbs, and bare-root stock will likely also be planted to supplement the seeding.

3.2.2 Buffer Zones

Around the perimeter of each phase of enhancement, a buffer zone of approximately fifteen feet in width will be established to help prevent non-native species such as *Geranium lucidum*, pennyroyal (*Mentha pulegium*), hairy cat's ear (*Hypochaeris radicata*), and annual ryegrass (*Lolium multiflorum*) from spreading into enhancement area. These buffer areas will be planted with an aggressive native grass mix (see Plant Species List), likely using a no-till seed drill to insure good coverage. Native forbs will be added to the buffer areas over time to increase diversity.

Table 3-1
Prairie and Vernal Pool Enhancement Schedule

Task	Approximate Date
	Year One
Herbicide Application #1	May
Herbicide Application #2 (if needed)	Late June
Herbicide Application # 3	September (after green-up)
Native Forb Planting (seeding)	Late September
Buffer Planting (aggressive seed mix)	Late September
Supplemental Forb Planting (plugs/bulbs) and Jucus/Cares (bare-root)	October
	Year Two
Evaluate Plant Community	Spring/Summer
Hand Weeding and/or Spot Herbicide Application	Summer
Grass Specific Herbicide Application (if needed)	September (after green-up)
Native Grass Planting and Supplemental Forbs	Late September
	Year Three
Evaluate Plant Community	Spring/Summer
Hand Weeding and/or Spot Herbicide Application	Summer

3.2.3 Weed Control

Follow-up hand weeding and/or spot herbicide application will likely be conducted in the spring and summer of the first two years following planting to control non-native species. This has proven to be a very important step in the enhancement process on other mitigation bank sites. If necessary, a grass specific herbicide application may be used prior to planting of the native grass species in the second year. Evaluation of the post planting site conditions will dictate the precise weed control approach to be used on the site.

Calochortus tolmiei

3.4 Upland Prairie Enhancement

Approximately 1.3 acres of upland is present on the southernmost edge of the site where the toe slope of the adjacent hill merges with the flat valley bottom. This area was determined to be upland during the site's wetland delineation and is covered primarily in annual ryegrass.

This area will be converted to a native upland prairie plant community in conjunction with the adjacent wet prairie and vernal pool enhancement that will be implemented under Phase I. This work will start in spring 2006. The no-till site preparation technique used in this area will be the same as is proposed for the adjacent wetland area, with multiple herbicide applications. The herbicide applications will be done concurrently in the upland and wetland areas of Phase I, followed by a year-one upland prairie forb planting and a year-two upland prairie grass planting. In addition, some plugs, bulbs, and cuttings will be

used to further supplement the seeding, including species such as Romer's fescue (*festuca idahoensis* var. *roemeri*), cat's ear (*Calochortus tolmiei*), Oregon iris (*Iris tenax*), and pine bluegrass (*Poa scabrella*), as local supplies allow. No mitigation bank credits will be requested for the upland prairie enhancement.

Area of proposed forested wetland restoration

3.5 Forested Wetland Enhancement

A patch of scattered mature Oregon ash, approximately 0.9 acres in size, lies just to the north of the East Fork of Coyote Creek in the Phase II enhancement area. The area below the trees is dominated with annual ryegrass, but also contains fairly significant patches of camas (*Camassia quamash*). This area will be restored in a similar fashion to the adjacent prairie with the eradication of the annual ryegrass, but the trees will be retained. In this situation, an effort will be made to delay the herbicide application until after the camas has gone dormant, or to use a grass specific herbicide, which will not harm the camas. A plant survey is scheduled for this area in June to document the presence of native species.

3.5 Coyote Swale Enhancement

Coyote Swale is an agricultural drainage feature approximately 3,800 feet in length that runs from east to west across the site. The channel, first cut in the early 1970s, is fairly narrow and deep and is experiencing erosion and slumping in numerous locations. From a habitat perspective, it will be beneficial to retain the channel in some form because it provides a diversity of habitat within the larger expanse of prairie and also intercepts runoff flowing onto the site from adjacent properties, which is likely to contain quantities of weed seed.

Slumping along Coyote Swale

To improve the channel over the short-term a combination of coir (coconut fiber) matts and waddles will be placed in the most eroded sections of the channel bottom. A total of eight locations have been identified for the treatment and the matts and waddles will be installed in summer 2006. The coir waddles act as a small check dam, which serves to slow the velocity of the flow and to dissipate energy. The coir matts serve to stabilize the channel bottom both above and below the waddles. Coir lasts for several years, but eventually biodegrades. Rock will be placed in some of the more incised areas prior to coir placement to help stabilize the channel bottom.

Coyote Swale

Over the long-term, several options will be considered for the enhancement of the channel. The ultimate goal will be to create a shallow swale that's less prone to erosion that will contain native wet prairie and emergent vegetation. Ideally, the channel would be accessible for maintenance activities such as mowing, which would

require banks that have a much shallower slope. Options for channel enhancement that will be considered include:

- Retaining the existing channel profile, but stabilizing the channel bottom with native vegetation and coir waddles and matts. This would be the least expensive approach, but would limit access to the channel bottom for vegetation management.
- Re-contouring the channel so that the banks have a shallower slope (10:1 or less) and re-vegetating the swale with native prairie and emergent wetland species.
- Re-locating the channel adjacent to its current alignment, with a more meandering configuration. The existing channel would be filled using the material excavated from the new channel.

The ultimate approach will be dependent on further study, available funding, and the success of the short-term stabilization.

3.6 Fencing

Much of the site is currently fenced with a variety of fence types in varying condition The exception is the eastern edge of the property, which is currently unfenced, as the leasing farmer also farms the property to the east concurrently. The fencing is beneficial in that it limits livestock from entering the site from adjacent properties, it defines the property boundary, and prevents vehicular access from Cantrell Road. For these reasons, most of the existing fencing will be retained, with the possible exception of the fencing along Cantrell Road.

3.6.1 Wildlife Friendly Fencing

There will be the need to replace or add fencing on the site in the coming years. In order to prevent injury or entanglement to wildlife as it crosses the site, a wildlife friendly fencing design will be phased in as new fencing is added and old fencing is replaced. Wildlife friendly fencing can vary in design, but should have the following attributes:

- A wooden rail should be used along the fence top;
- A smooth wire (no barbs) should be used along the fence bottom;
- The top of the fence should not exceed 40 inches in height and the bottom should be no lower than 16 inches from the ground;
- All wires should be kept taut to prevent entanglement; and
- As a temporary fix to existing barbed wire fencing along know wildlife travel routes can be the addition of a PVC pipe covering the top wire of the fence.

The barbed wire fencing along Cantrell Road will be removed once the hedgerow is established enough to keep out vehicles.

3.6.2 Removal of Cantrell Road Fencing

Because the fence along Cantrell Road isn't needed as a livestock barrier, its only current purpose is preventing vehicular access. A thick hedgerow has already established along much of this fence line, and if supplemented with additional shrub and tree plantings, could serve as an adequate

vehicular barrier, thereby eliminating the need for a fence. Native shrub and tree species such as Sukdorf's hawthorn (*Crataegus douglasii* var. suksdorfii), Pacific ninebark (*Physocarpus capitatus*), nootka rose (*Rosa nutkana*), hardhack (*Spirea douglassi*), snowberry (*Symphorocarpus alba*) and creek dogwood (*Cornus sericea*) will be planted in areas along this fence line, and once it has adequately established, the existing fencing will be removed. In areas where a thick hedgerow already exists, fencing can be removed at any time.

3.7.3 Temporary Fencing to Define Enhancement Area Boundaries

As phases of enhancement are completed, temporary cable fencing (no barbs) mounted on t-posts will be installed to define the enhancement area and prevent accidental access by the leasing farmer. This fencing would be similar to the temporary fencing that has been used around the experimental test plots.

Recently installed gate at the main site access

3.6.4 Gates

Locked gates have recently been installed at the two existing entry points in an effort to control access and limit illegal dumping. These will remain locked at all times, with keys provided to WEW Partner staff, the leasing farmer, researchers, and the BPA.

3.7 Public Access

In order to prevent possible conflict with ongoing agricultural practices and minimize disruption to wildlife and plant communities once the site has been restored, no formalized public access to the site is planned.

3.8 Access for Enhancement and Maintenance

The primary entry point to the site will continue to be the gated parking area along Cantrell Road. A secondary gated entry from Cantrell Road along the western edge of the site. Equipment accessing the site for enhancement and maintenance purposed will use a designated route to cross the site, when possible, to limit impacts to the grass seed crop and eventually the restored prairie (see Action Plan Map). A tall post or flag will be placed at the property corner near Coyote Swale to help direct vehicles along this designated route and to the culverted crossing of Coyote Swale.

One of the culverts along the East Branch of Coyote Creek to be replaced

3.8.1 Culverts

Culverted crossings of Coyote Swale and the East Branch of Coyote Creek currently exist and should be retained to facilitate vehicular crossing for farming and enhancement purposes. Two 24-inch culverts along the East Branch of Coyote Creek are crushed and no longer function. These will be replaced in their

current location in summer 2006. A culvert on the eastern edge of the site will no longer be needed once enhancement is complete and will be removed at that time. The culvert outfall is currently causing some erosion problems. Before removal, the property boundary should be verified to determine if the culvert is actually on the site or the adjacent property.

3.8.2 Parking area

The existing gravel pad adjacent to Cantrell Road will continue to be the primary parking area and access point onto the site. This parking area is currently surfaced with coarse gravel and can support large vehicles in all seasons. The parking lot will be resurfaced, as needed, with gravel (3/4 minus) to eliminate potholes and better define the edge of the parking pad.

3.9 Short-term Maintenance

In preparation of implementation of the proposed restoration, the following interim maintenance will be done:

- Control invasive exotic plant species along the fringes of the site to prevent their spread into the areas proposed for restoration. Particular attention will be paid to forested edges on the southern portion of the site where *Geranium lucidum* is abundant; in the northeast corner of the site near the barn, where reed canarygrass (*Phalaris arundinacea*) and teasel (*Dipsacus follonum*) are well established; and along the East Branch of Coyote Creek and the forested areas where small patches of blackberry (*rubus armeniacus*) have established.
- Remove several small fir trees which are growing in the forested area on the southern edge of the site to prevent them from overtopping the oaks.
- Place coir waddles and matts along Coyote Swale (see section 3.5).
- Replace the two 24-inch culverts along the East Branch of Coyote Swale.
- Remove fencing along portions of Cantrell Road (see section 3.6) and replace gaps in other fencing with wildlife friendly fencing where necessary.
- Maintain buffer areas within the EPA wetland restoration test plots through mowing and control weeds such as hairy cat's ear (*Hypochaeris radicata*) and Canada thistle (*Cirsium arvense*).

3.10 Long-Term Maintenance

Once the proposed restoration is implemented, the following long-term site maintenance actions will be required:

- Burn and/or mow on an annually or semi-annually basis to keep the prairie areas from being overrun with trees and shrubs over time. Mowing and burning will occur between mid-August and late-September to minimize impacts to wildlife such as ground nesting birds. With its rural location, the site is well suited for controlled burns, and many of the adjacent properties currently burn their grass seed fields in the fall. On a limited basis, mowing may occur earlier in the season in buffer areas to prevent exotic species from going to seed or to create fire breaks for controlled burns.
- Monitor for, and control, exotic invasive plant species to prevent their spread into the restoration areas. Particular attention will be given to reed canarygrass (*Phalaris arundinacea*); pennyroyal (*Mentha*

pulegium) along eastern edge of the site; and *Geranium lucidum* along the forested edges. All of these species have potential to spread quickly across the site if become established.

- Remove non-native trees and shrubs growing along the fence lines around the property boundary to prevent their spread onto the site.
- Convert the site's existing perimeter fencing with a more wildlife friendly fence type over time, as outlined in section 3.6.1.
- Remove debris buildup from culverts.
- Resurface parking area as needed.

An existing habitat snag along the East Branch of Coyote Creek is commonly used by raptors.

3.11 Other Habitat Enhancements

Beyond the restoration of native habitats, the following wildlife habitat enhancements will be considered for the site over the long-term:

3.11.1 Habitat snags

Habitat snags may be added to the prairie areas over time, as has been done and elsewhere in west Eugene and the Fern Ridge Reservoir area. The logs are brought onto the site and set upright in a preferred location, much the way that a telephone pole would be positioned. The snags drilled or cut to provide nesting cavities and may be topped with platforms for Osprey nesting.

3.11.2 Cover

To provide cover for wildlife within the large expanse of prairie, several small islands of shrubs will be established (see Action Plan Map). This will occur over the long-term once the planned prairie restoration is fully established and the locations shown on the Action Plan are conceptual.

3.11.3 Riparian Enhancement

The forested riparian zone along the East Branch of Coyote Creek is somewhat thin in areas. To provide better shading of the waterway and increase habitat value, native riparian tree and shrub species will be planted along these designated perimeter areas. This will occur once the planned prairie enhancement is fully established in those areas.

The riparian zone along the East Branch of Coyote Swale will be widened in places once the proposed prairie restoration in that area is complete.

3.12 Mitigation Phasing

The proposed enhancement will be phased in over a number of years starting in spring 2006 with implementation of the 31.2 acre first phase, which is located on the southern end of the site. This phase will include 21.4 acres of wet prairie enhancement, 1.5 acres of vernal pool enhancement, 1.8 acres of buffer area wetland enhancement (mostly prairie), and 1.0 acre of upland prairie enhancement along with maintenance activities along 5.5 acres of forested area. In addition, the

unfarmed area approximately one acre in size in the northeast corner of the site a will be included in the phase I enhancement. Special attention will be given to protect the existing *Lomatium bradshawii* population found in that area. The second phase will occur in the area just to the north of the East Branch of Coyote Creek and will cover approximately 33.9 acres. Additional phases will be implemented across the site from east (uphill) to west. The final phase of enhancement will include the twelve acres accommodating the EPA test plots and 20.2 acres planted in tall fescue along the eastern edge of the site. Tall fescue is an perennial crop and the leasing farmer has requested that this be retained for as long as possible. The exact size of each phase will be dependant on Mitigation Bank needs and available resources (see Phasing Map). The enhancement of Coyote Swale will likely be implemented following the proposed wetland enhancement.

Table 3-2
Enhancement Acres by Phase

Phase (estimated start date)	**Enhancement Type**	**Acres**
Phase I (May 2006)		
	Wet Prairie	21.4 acres
	Vernal Pool	1.5 acres
	Wetland Buffer Planting*	1.8 acres
	Total Wetland Enhancement:	**24.7 acres**
	Upland Prairie	1.2 acres
	Upland Prairie Buffer	0.1 acres
	Total Upland Enhancement:	**1.3 acres**
	Other non-bank area to be maintained in phase I	5.2 acres
Phase II (May 2007)		
	Wet Prairie	23.6 acres
	Vernal Pool**	1.2 acres
	Wetland Buffer Planting	2.4 acres
	Forested Wetland	0.9 acres
	Total Wetland Enhancement:	**28.1 acres**
	Other non-bank area to be maintained in phase II	5.8 acres
Middle Phases (May 2008)	Note: The middle phases will be implemented over several years depending on Bank need and available resources.	
	Wet Prairie	121.3 acres
	Vernal Pool**	3.2 acres
	Wetland Buffer Planting	4.0 acres
	Total Wetland Enhancement:	**128.5 acres**
Final Phase		
	Wet Prairie	33.5 acres
	Vernal Pool**	8.8 acres
	Emergent Wetland	0.4 acres
	Wetland Buffer Planting	3.1 acres
	Total Wetland Enhancement:	**45.8 acres**
	Total Wetland Enhancement: (all phases combined)	**227.1 acres**
	Total Upland Enhancement: (all phases combined)	**1.3 acres**

* *Phase I includes the 1.0 acre triangular piece along Cantrell Road*
** *includes Coyote Swale Enhancement Area.*

Kenneth Nelson Road

Cantrell Road

Jackson Ownership

Later Phase (25.6 acres)

EPA Test Plots

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Fenced

Phase I (1.0 acre)

Barn

N W E S

0 100 200 400 Feet

Scale

One Acre

380

Van De Hey Ownership

Sadri Ownership

BPA Power Easement

BPA Power Easement

385

Middle Phases

(128.5 acres: phasing will occur from east to west - actual size will depend on mitigation bank needs)

380

Later Phase

(20.2 acres)

395

405

410

415

420

425

430

435

Fence Line

BPA Power Easement

Swale

Oak and ash forest

Phase II

(33.9 acres)

Coyote

Tapp Ownership

Tapp Ownership

Oak and ash forest

East Branch Coyote Creek

Coyote Creek

Phase I

(31.2 acres)

Oak and ash forest

Sadri Ownership

Sadri Ownership

Sadri Ownership

Suiss Ownership

Coyote Prairie

Phasing Map

Legend

- Site Boundary (extent of City ownership)
- Tax Lot Line
- 5-foot Contour
- Waterway
- Agricultural or Roadside Ditch

Ownership: City of Eugene **Size:** 240.4 acres

Aerial Base: March 2004
Map Produced by LCOG

May 2006

4.0 Proposed Planting List

4.1 Vernal Pool/Emergent Wetland*

	Scientific Name	Common Name
Dominant species; approximately 60% to 70% of the seeding will be with the following:		
Graminoids	*Agrostis exarata*	spike bentgrass
	Beckmannia syzigachne	slough grass
	Glyceria occidentalis	western mannagrass
	Hordeum brachyantherum	meadow barley
	Carex densa	dense sedge
	Carex unilateralis	one-side sedges
Forbs	*Downingia elegans*	common downingia
	Epilobium densiflorum	dense spike-primrose
	Eryngium petiolatum	coyote thistle
	Grindelia integrifolia	Willamette Valley gumweed
	Plagiobothrys figuratus	fragrant popcorn-flower
Smaller amounts of the following will be seeded as available:		
Graminoids	*Glyceria occidentalis*	northwestern mannagrass
	Juncus acuminatus	tapered rush
	Juncus bolanderi	Bolander's rush
	Juncus oxymeris	pointed rush
Forbs	*Gratiola ebracteata*	bractless hedge-hyssop
	Lasthenia glaberrima	smooth lasthenia
	Madia glomerata	cluster tarweed
	Navarretia intertexta ssp. intertexta	needle-leaved navarrertia
	Rumex salicifolius	willow dock
	Veronica scutellata	marsh speedwell

** The proposed planting list above will likely be reassessed and fine tuned based on seed availability, which can vary from year to year.*

4.2 Wet Prairie Wetland*

	Scientific Name	Common Name
Dominant species: Approximately 60% to 70% of the seedling will be with the following:		
Graminoids	*Agrostis exarata*	spike bentgrass
	Carex unilateralis	one-sided sedge
	Deschampsia cespitosa	tufted hairgrass
	Juncus tenuis	slender rush
Forbs	*Aster hallii*	Hall's aster
	Camassia quamash	common camas
	Epilobium densiflorum	dense spike-primrose
	Eriophyllum lanatum	wooly sunflower
	Grindelia integrifolia	Willamette Valley gumweed
	Microseris laciniata	cut-leaf microseris
	Potentilla gracilis	slender cinquefoil
	Prunella vulgaris ssp. *lanceolata*	self-heal
	Ranunculus orthorhynchus	straightbeak buttercup
Diversity Species: Smaller amounts of the following will be seeded as available:		
Graminoids	*Beckmannia syzigachne*	American slough grass
	Danthonia californica	California oat-grass
	Luzula comosa	field woodrush
	Dichanthelium acuminatum	western panic-grass
Forbs	*Clarkia quadrivulnera*	purple godetia
	Collomia grandiflora	large-flowered collomia
	Epilobium densiflorum	dense spike-primrose
	Lomatium nudicaule	barestem lomatium
	Lotus formosissimus	seaside trefoil
	Lotus unifoliolatus	Spanish-clover
	Lupinus rivularis	stream lupine
	Madia sativa	coast tarweed
	Madia elegans	showy tarweed
	Orthocarpus bracteosus	rosy owl-clover
	Perideridia montana	Gairdner's yampah
	Ranunculus occidentalis	western buttercup
	Saxifraga oregana	Oregon saxifrage
	Sidalcea cusickii	Cusick's checkermallow
	Sisyrinchium idahoense	blue-eyed grass
	Wyethia angustifolia	narrow-leaf muleears
	Zigadenus venenosus	death camas

** The proposed planting list above will likely be reassessed and fine tuned based on seed availability, which can vary from year to year.*

4.3 Upland Prairie*

	Scientific Name	Common Name
Graminoids	*Bromus carinatus/sitchensis*	California brome
	Carex tumulicola	one-sided sedge
	Deschampsia cespitosa	tufted hairgrass
	Danthonia californica	California oat-grass
	Dichanthelium acuminatum	western panic-grass
	Elymus glaucus	blue wildrye
	Festuca idahoensis var roemeri	Romer's fescue
	Juncus tenuis	slender rush
	Luzula comosa	field woodrush
Graminoids	*Achillea millefolium*	yarrow
	Allium amplectens	slim-leaf onion
	Aster hallii	Hall's aster
	Brodiaea coronaria	harvest lily
	Camassia leichtlinii var. *suksdorfii*	great camas
	Clarkia quadrivulnera	purple godetia
	Collomia grandiflora	large-flowered collomia
	Danthonia californica	California oatgrass
	Delphinium menziesii	Menzie's larkspurt
	Dichelostemma congestum	compact harvest lily
	Eriophyllum lanatum	wooly sunflower
	Lupinus sulphurus spp. *kincaidii*	Kincaid's lupine
	Madia elegans	elegant tarweed
	Microseris laciniata	cut-leaf microseris
	Nemophila menziesii var. *atomaria*	pale baby blue-eyes
	Plectritis congesta	sea blush
	Potentilla gracilis	Northwest cinquefoil
	Prunella vulgaris ssp. lanceolata	Northwest self-heal
	Ranunculus occidentalis	western buttercup
	Sidalcea virgata	Pink checkermallow
	Sisyrinchium idahoense	narrow-leaf blue-eyed grass
	Triteleia hyacinthina	hyacinth brodiaea
	Wyethia angustifolia	narrow-leaf muleears
	Zigadenus venenosus	death camas

** The proposed planting list above will likely be reassessed and fine tuned based on seed availability, which can vary from year to year.*

4.4 Buffer Planting Mix*

Scientific Name	Common Name
Agrostis exarata	spike bentgrass
Danthonia californica	California oatgrass
Deschampsia cespitosa	tufted hairgrass
Elymus glaucus	blue wildrye
Hordeum brachyantherum	meadow barley

* Buffer seed mixes may be supplemented with other native grasses and forbs to increase diversity or to reflect special site conditions.

5.0 Mitigation Credits

5.1 West Eugene Wetland Mitigation Bank Authority

The Coyote Prairie MIP is proposed to generate mitigation credit for the West Eugene Wetland Mitigation Banking Program under the authority of the Memorandum of Agreement (MOA) between the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Oregon Department of Environmental Quality, Oregon Division of State Lands, U.S. Bureau of Land Management, and the City of Eugene. The Agreement, signed in 1995, activated the West Eugene Wetlands Mitigation Bank which represents one product of a unique partnership between the City of Eugene, The Nature Conservancy (TNC), and the U.S. Department of Interior, Bureau of Land Management (BLM). The partnership originated in 1992 with adoption of the West Eugene Wetlands Plan (WEWP) and implementation of the mitigation bank was one of the Plan's goals.

5.2 WEW Mitigation Bank Credits

Under the proposed actions included in this MIP, a total of approximately 227.1 acres of wetland enhancement are designated for compensatory wetland mitigation. At a 2:1 credit ratio, an estimated 113.6 mitigation credits will be generated. Credits are not being requested for the upland prairie enhancement or maintenance actions which are prescribed for the forested portions of the site.

Table 5-1
WEW Mitigation Bank Estimated Credit Summary Table

Enhancement Type*	Total Acres	Credit Ratio	Credits
Wet Prairie	199.8 acres	2:1 (0.5)	99.90
Vernal Pool	14.7 acres	2:1 (0.5)	7.35
Emergent Wetland	0.4 acres	2:1 (0.5)	0.20
Forested Wetland	0.9 acres	2:1 (0.5)	0.45
Buffer Wetland*	11.3 acres	2:1 (0.5)	5.65
	227.1 acres	**Total Credits:**	**113.55**

**Buffer areas will primarily be wet prairie, with some inclusions of vernal pool wetland.*

6.0 Monitoring Plan

The purpose of this monitoring plan is to identify the tasks that must be followed to document and demonstrate that the wetland mitigation goals for the site have been met. The Mitigation Bank partners will be responsible for monitoring, maintaining, and reporting the performance of this project. Monitoring shall occur for a period of not less than five years from the date that each phase is substantially completed.

The goals, performance criteria, and objectives listed below are intended for areas proposed for wetland enhancement under the Mitigation Bank and do not apply to areas proposed for upland prairie enhancement or for general maintenance activities prescribed for the forested portions of the site.

6.1 Vegetation

6.1.1 Wetland Mitigation Goals

- Re-establish a mosaic of vernal pool, wet prairie, and emergent wetland habitats that likely existed in this area prior to agricultural conversion.
- Control invasive plant species in areas immediately adjacent to the proposed enhancement area to prevent their spread into the newly graded areas. This would include species such as reed canary-grass (*Phalaris arundinacea*), annual ryegrass (*Lolium multiflorum*), tall fescue (*Schedonorus phoenix*), teasel (*Dipsacus fullonum*), spring cranesbill (*Geranium lucidum*), pennyroyal (*Mentha pulegium*), hairy cat's ear (*Hypochaeris radicata*) and Himalayan blackberry (*Rubus armeniacus*).
- Maintain prairie habitats over the long-term through a combination of mowing and burning.
- Maintain the quality of enhancement areas over the long-term through supplemental weeding and plantings where necessary.

6.1.2 Performance Criteria

- The enhanced wetlands shall be dominated by native plant species where total native composition represents at least 50% cover within five years.
- The wetland enhancement areas shall remain largely free of woody vegetation and largely free of exotic species such as reed canarygrass (*Phalaris arundinacea*), annual ryegrass (*Lolium multiflorum*), tall fescue (*Schedonorus phoenix*), teasel (*Dipsacus fullonum*), spring cranesbill (*Geranium lucidum*), pennyroyal (*Mentha pulegium*), hairy cat's ear (*Hypochaeris radicata*) and Himalayan blackberry (*Rubus armeniacus*). Non-native species shall not exceed 15% of the total vegetative cover after five years.

6.1.3 Monitoring Objectives

- Objective: Estimate the percent cover of all species in the enhanced wet prairie using point intercept sampling methodology five years after enhancement. Estimates should

have 90% confidence intervals of no more than +/- 20 percent frequency. In addition, we want to be 90% sure of detecting a 30% change in percent frequency for any species occurring in the macroplot and we are willing to accept a 1 in 10 chance that we will incorrectly conclude that a 30% change took place even if it really did not.

- Objective: Annually survey the wetland enhancement area for populations of rare plants. Monitoring will occur during the time of year when the plants are flowering.
- Objective: Inventory and compile a checklist of all vascular plant species present on the site. Inventory will be updated, at a minimum, once per growing season. The purpose is to document species diversity, to document the relative proportion of native and non-native species present on the site, to assess the presence of non-native species that may require management actions, and to document which species, that were planted or seeded, have successfully established.

6.2 Hydrology

6.2.1 Mitigation Goals

- Maintain the existing wetland hydrology where it exists across the site.
- In the short-term, stabilize the Coyote Swale agricultural drainage to limit further erosion. Over the long-term, enhance the swale, creating a gradual transition from wetland prairie to emergent wetland.

6.2.2 Performance Criteria

- No performance criteria for wetland hydrology have been formally established in the MOA. However, hydrologic conditions must be appropriate for the types of wetland plant communities that are to be established.

6.2.3 Monitoring Objectives

- Objective: Document hydrology during the 2nd year following planting.
- Objective: Document (with photographs and written observations) the extent of surface hydrology and soil saturation during the 2nd quarter of the 2nd and 5th years to document the persistence of wetland hydrology. Staff gauges should be placed across the management area in accessible locations and should be coordinated with established photo points.
- Objective: Document and observe the extent of channel stability along Coyote Swale. Map areas where significant erosion, channel incising, and slumping are occurring.

6.3 Soils

6.3.1 Mitigation Goals

- Maintain and restore native wet prairie, vernal pool, and emergent wetland conditions.

6.3.2 Performance Criteria

- No performance criteria for hydric soils have been formally established in the MOA. However, the soil should be hydric and able to support the native wetland plant community and wetland hydrology.

6.3.3 Monitoring Objective

- Objective: Document the presence of hydric soils within each of the three wetland plant communities present on the site.

6.4 Wildlife

6.4.1 Project Goal

- Enhance habitat conditions to be more suitable for native wildlife species associated with a wetland/upland prairie system such as western meadowlark, short-eared owl, Northern harrier, savanna sparrow, camas pocket gopher, gray-tailed vole, Roosevelt elk, chorus frog, garter snake, gopher snake, and Fender's blue butterfly.

6.4.2 Performance Criteria

- No performance criteria for wildlife have been formally established in the MOA.

6.4.3 Monitoring Objectives

- Objective: Document wildlife sightings within the mitigation area during site visits.
- Objective: Document wildlife sightings within the area during quarterly site visits if funding exists or with volunteers. If possible, a baseline survey should be conducted to assess the extent of resident populations of species in advance of implementation of prescriptions. Subsequent surveys should be conducted at a minimum of two-year intervals to assess the extent of the wildlife population if funding is available.

Appendix-A

Wetland Function Assessment and Delineation for the Coyote Prairie Mitigation Bank Site*

March 2006

**The appendix includes a portion of the delineation report. The full report is available on request.*

WETLAND FUNCTION ASSESSMENT AND DELINEATION

for the

Coyote Prairie Wetland Mitigation Bank Site
Lane County, Oregon
T18S, R5W, Section 1, Tax Lot 100 on Tax Map 18-05-01

March 2006

Prepared for
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ES Project Number 05-1201

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1.0 GENERAL INFORMATION

The City of Eugene has recently purchased approximately 240 acres of agricultural land west of Eugene for the purpose of incorporating it into the West Eugene Wetland Bank system as the Coyote Prairie Wetland Mitigation Bank Site. As part of the Mitigation Banking process, the Memorandum of Agreement (MOA) for the Mitigation Banking Program to Implement the West Eugene Wetlands Plan requires a narrative describing the existing physical and biological conditions as follows:

- Landscape habitats (including wetlands), hydrology, soils, vegetation, elevations, surrounding land uses, wildlife, current functions and values, and cultural amenities such as parks and bicycle and pedestrian paths.

The purpose of this Wetland Function Assessment is to provide baseline information about hydrology, soils, vegetation, wetlands, current wetland functions and values, and wildlife use for the 240-acre Coyote Prairie Wetland Mitigation Bank Site, referred to as the Coyote Prairie Site in this report.

As part of the baseline conditions, this report also provides a wetland delineation for the Coyote Prairie Site.

2.0 METHODS

2.1 Wetland Identification and Delineation

The Coyote Prairie site was evaluated for the presence of wetlands based on the criteria defined in the 1987 US Army Corps of Engineers Wetland Determination Manual (1987 Manual) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Per the Manual definition, wetlands must possess the following criteria: 1) hydrophytic (water-loving) vegetation, 2) hydric soil conditions (created under saturated conditions), and 3) wetland hydrology. All three criteria must be found together in order to identify a wetland. However, because the vast majority of the site has been significantly altered from natural conditions by ditching, plowing, and conversion to a ryegrass and fescue monoculture, and because the site is being considered for conversion to non-agricultural use, it was studied following the 1987 Manual procedure for agricultural sites per Oregon Department of State Lands (DSL) and US Army Corps of Engineers (Corps) policy. The field evaluation consisted of the following determinations:

- Areas without indicators of hydric soil are designated as upland;
- Areas with hydric soils and evidence of ponding, inundation, or soil saturation in the top 12" of the surface during the beginning of the growing season are designated as wetland;
- Areas with hydric soils and no evidence of inundation, ponding, or soil saturation in the top 12" of the surface during the beginning of the growing season are designated as upland.

Six sampling transects were established on the site to document hydrology and soil information during the early part of the growing season, as evidenced by growth in the seeded ryegrass. The field surveys were conducted on February 24, March 2, and March 3, 2006. Vegetation, soils and hydrology were documented for each of the sample plots.

Vegetation at each sample plot was summarized as percent of total cover by species and strata (tree, shrub/sapling, and herbaceous). Because of the significant alteration in the majority of onsite vegetation due to its management for grass production, vegetation information was only documented on the data sheets and not relied upon to make the wetland determination except in the few locations where vegetation was in a natural condition. In those instances, plants were identified in the plot and classified according to their habitat requirements, based on the 1988 publication entitled *The National List of Plant Species that Occur in Wetlands: Oregon*, by the US Department of Interior Fish and Wildlife Service and the 1993 update. Plant species that are wetland indicators are classified as Facultative (FAC and FAC+), Facultative Wet (FACW), and Obligate (OBL). Those that are primarily indicators of upland conditions are classified as Facultative Negative (FAC-), Facultative Upland (FACU) and Upland (UPL). Plants were identified using Hitchcock et al *Vascular Plants of the Pacific Northwest* and Hitchcock et al *Flora of the Pacific Northwest*.

Soil profiles were described for each plot. Soil pits were dug to a depth of 16-18 inches. Soil colors were identified from the Earthcolors Soil Color Charts, which follows the Munsell colors, notations, and color names. The primary observed indicators of hydric soil conditions were a chroma of 1 or a chroma of 2 with the presence of redoximorphic features (mottling) in the top 10 inches of the soil pit. The soil pits were also evaluated for hydrology conditions. The primary observed indicators of wetland hydrology used to determine wetland conditions were inundation or saturated soils in the top 12 inches. Wetland/upland boundaries were determined to be at the boundary of where soils were observed to change from hydric to nonhydric conditions, and at the boundary of where wetland hydrology indicators were no longer observed in the top 12 inches of the soil profile.

Because the purpose of the wetland study is to provide baseline information in part for determining potential mitigation credits, and because the site is mapped entirely with hydric soils and was observed to be saturated in the top 12 inches or inundated during the February and/or March site visits (with the exception of a small area of nonhydric soils and upland vegetation in the southeast corner of the site), only 1 or 2 sampling visits were made to each individual sample plot.

2.2 Wetland Function and Value Assessment

A wetland function assessment was completed to evaluate the quality of thirteen wetland functions for the Coyote Prairie wetlands, using the Hydrogeomorphic (HGM)-based assessment method developed by the Oregon Department of State Lands (DSL) for wetland and riparian sites in Oregon (Adamus and Field 2001). This procedure is an adaptation of the national wetland functions assessment approach that is based on the concept that hydrologic and geomorphic factors control how wetlands function. This technique uses HGM classifications (i.e., Slope/Flats), reference wetlands, assessment models, and functional indices to assess the level at which a wetland performs the selected functions. The Oregon HGM method evaluates how a wetland performs thirteen physical and biological functions, using data collected on various field indicators during site surveys as well as information from maps, aerial photos, and local soil surveys. These functions are briefly described below.

PHYSICAL FUNCTIONS:

1. Water storage and delay: Capacity to store or delay downslope movement of surface water for long or short periods.
2. Sediment stabilization & phosphorus retention: Capacity to intercept suspended inorganic sediments, reduce current velocity, resist erosion, and/or retain any forms.
3. Nitrogen removal: Capacity to remove nitrogen by supporting temporary uptake of nitrogen by plants and microbial conversion.
4. Thermoregulation: Capacity to maintain or reduce water temperature.

BIOLOGICAL FUNCTIONS:
5. Primary production: Capacity to use sunlight to create organic matter through photosynthesis.
6. Resident fish habitat support: Capacity to support most life requirements of non-anadromous species native to area.
7. Anadromous fish support: Capacity to support some life requirements of anadromous species native to area.
8. Invertebrate habitat support: Capacity to support life requirements of many invertebrate species characteristic of such habitats in this area.
9. Amphibian & turtle habitat: Capacity to support some life requirements of several species of amphibians & turtles native to this area.
10. Breeding waterbird support: Capacity to support requirements of many waterbird species during their reproductive period in this area.
11. Wintering & migrating waterbird support: Capacity to support some life requirements of several waterbird species that spend fall, winter, and/or spring in this area.
12. Songbird habitat support: Capacity to support the life requirements of many native non-waterbird species that are either seasonal or breeders in this area.
13. Support of characteristic vegetation: Capacity to support life requirements of many plants and plant communities native to this area.

The assessment area used with the HGM assessment method is determined to be the wetland area to its upland boundaries, or to where it changes HGM class. For the Coyote Prairie site, a single wetland assessment area was selected because it was determined that all but approximately 3 acres of the 240-acre site is one contiguous wetland.

Two assessment approaches are provided with the Oregon method, including the Reference-based Method, which evaluates functions quantitatively by comparing observations of functional indicators with the assessed wetland to data from reference wetlands collected during development of the Oregon HGM method, and the Judgmental Method which provides a checklist type of qualitative evaluation. The current HGM Guidebook as approved by DSL contains reference data and methods for evaluating wetland functions for Slope/Flats and Riverine Impounded wetlands in the Willamette Valley (Adamus and Field 2001). Wetlands not within these two HGM classes are evaluated using the Judgmental Method. Because the vast majority of the site is in the Slope/Flats HGM class, with less than 1% of the area determined to be in the Riverine Flow-through HGM class (ditches and the East Branch of Coyote Creek), the entire site was evaluated as being in the Slope/Flats HGM class, and the Reference-based assessment method was used.

Through a scoring process, the performance of each function is compared to wetland sites that have high function scores, based on information collected from many reference wetlands used in

the development of the HGM assessment process. The process of comparing reference sites to the assessment wetland allows two options: Highest-Functioning Standard (HFS) and Least-Altered Standard (LAS). The HFS compares the assessment site functional capacity score with the highest score found among all reference sites of the same class or subclass. The LAS compares the assessment site functional capacity score to the scores from the reference sites that were determined to be the least-altered sites in the Willamette Valley. The final scores are based on a 0 to 1 scale with 0 being lowest and 1 being highest. The HFS was used for the Coyote Prairie Mitigation Bank Site because of the onsite wetlands' history of significant changes from natural conditions as a result of agricultural and pasture use.

A Wetland Value Assessment was also completed for the Coyote Prairie site, which uses a qualitative checklist to determine the relative value of each of the 13 wetland functions, as described in the HGM-based Assessment Method of Oregon Wetland and Riparian Sites for the Willamette Valley Ecoregion (Adamus and Field 2001). The value assessment is a tool to determine the economic, ecological, and social importance of wetland functions as a result of the site's opportunity to provide functions, goods, and services, and also determine the relative significance of the functions. Each value indicator is assessed as it exists on the site at the present time (refer to Table 1). The qualitative checklist reflects concepts such as scarcity of similarly-functioning sites, the likelihood of functions being manifested as "services" to offsite people or resources, the existance of official designations, and the opportunity of a site to perform certain geochemical functions (Adamus and Field 2001).

Factors that have a negative effect on wetland value include management for agricultural production with potential detrimental ecological and economic effects including degradation of wildlife habitat with conversion to a monoculture, water quality from regular application of herbicides and fertilizers as well as increased sedimentation from erosion of plowed soils, and loss of soil from increased erosion of plowed lands. An additional factor that has a negative effect on wetland value is the site's similarity to the watershed landscape: is the HGM class or onsite habitat unique and rare relative to the watershed landscape? Positive factors that affect the ecological value include the opportunity for the site to provide habitat for rare plant and animal species and active management at the present time to encourage their establishment. The final scores are based on a 0 to 1 scale with 0 being lowest and 1 being highest. Refer to the Supplemental Information section for specific data sheets.

2.3 Wildlife and Plant Surveys

An inventory of plant and wildlife species was compiled while in the process of conducting the field surveys.

3.0 EXISTING CONDITIONS OF COYOTE PRAIRIE MITIGATION BANK SITE

3.1 General Conditions

The 240-acre Coyote Prairie Site is within the Coyote Creek drainage basin, and approximately 1 ½ miles southeast of Fern Ridge Reservoir. The majority of the Coyote Prairie Site is agriculturally degraded wetlands, which have been altered significantly from natural conditions by regular plowing, leveling, ditching, seeding to agricultural grass species, managing the agricultural crop monoculture by use of herbicides to control competitor species, fertilizers to encourage growth of the agricultural crop, harvesting, and haying. Sheep have been grazed on the

site in late winter to early spring, as a means of stimulating root growth in the ryegrass. The site is also regularly burned in late summer of early fall, after harvesting and haying. The City of Eugene has 11 acres of experimental plots in the north portion of the site that are not subject to the agricultural management described above. These plots predominantly contain native tufted hairgrass (*Deschampsia cespitosa*), and are being used to study how alternative site preparation treatments affect soil mycorrhizae, seed bank composition, soil ecosystem functions, plant community composition, and plant productivity.

The site has a gentle northwest aspect, and ranges in elevation from 390 feet above sea level in the southeast corner down to 380 feet in the northwest corner. There is very little microtopographic relief across the site, evidenced as a few depressional areas that average only 6 inches lower than the surrounding landscape. Based on information from the previous owner and farmer, the site has been mechanically leveled to reduce high spots and fill in low spots in order to maximize agricultural production.

The East Branch of Coyote Creek, a small intermittent stream, crosses the southern portion of the site. The East Branch joins Coyote Creek approximately 400 feet west of the site. One of the few areas on the site that has not been converted to agricultural use is north adjacent to the creek; it has an overstory of native Oregon ash (*Fraxinus latifolia*) and a mix of native and nonnative shrub and herbaceous species. Other areas within the site that have not been converted to agricultural production are in the southern portion of the site, including fringes of an ash forest along the southwest edge of the site and a small area of native Oregon white oak (*Quercus garryana*) woodland in the southeast corner of the site. The East Branch of Coyote Creek and associated young ash forest separates the larger northern field from a smaller field to the south. This field is also managed for annual ryegrass production.

3.2 Vegetation

The dominant vegetation across the Coyote Prairie site is nonnative annual ryegrass (*Lolium multiflorum:* UPL), which was at 30-75% cover across the fields on the February and March site visits. A small area in the northeast portion of the site is managed for tall fescue (*Festuca arundinacea:* FAC-) production. This area was recently seeded after being converted from annual ryegrass in 2005, and vegetation cover was at 10% on the February and March site visits. Very few plant species other than the ryegrass and fescue were observed in the fields. Small patches of annual bluegrass (*Poa annua*: FAC) were observed in the north portion of the site and the city's experimental plots were dominated with tufted hairgrass (*Deschampsia cespitosa*: FACW). Very few individuals of curly dock (*Rumex crispus*: FACW), popcorn flower (*Plagiobothrys* sp.), and chickweed (*Cerastium vulgatum*: FACU) were observed in the fields.

Dominant vegetation in the unmanaged areas included Oregon ash (*Fraxinus latifolia*: FACW) in the overstory with a few black cottonwood (*Populus balsamifera*: FAC) along the East Branch of Coyote Creek and the southwest edges of the site, and native Oregon white oak (*Quercus garryana*: UPL) as the overstory in a small area in the southeast corner of the site. The ash forested fringes are part of a larger ash forest located west and southwest of site, and the oak woodland appears to be an isolated feature on a local high spot that is approximately 1 foot higher than the land to the north and west. Understory species in the ash forested areas include native Nootka rose (*Rosa nutkana*: FAC), nonnative sweetbriar (*Rosa eglanteria*: FACW), nonnative shining geranium (*Geranium lucidum*: UPL), colonial bentgrass (*Agrostis tenuis*: FAC), tall

fescue, meadow foxtail (*Alopecurus pratensis*: FACW), camas, spreading rush (*Juncus patens*: FACW), and sedges including slough sedge (*Carex obnupta*: OBL). Dominant understory vegetation in the oak woodland include native snowberry (*Symphoricarpos albus*: FACU) and nonnative shining geranium.

Other native and nonnative species observed along the edges and banks of the ditches included camas (*Camassia* sp.: FACW), an unidentified checkermallow (*Sidalcea* sp.), Queen Anne's lace (*Daucus carota*: UPL), dovefoot geranium (*Geranium molle*: UPL), chickweed (*Cerastium vulgatum*: FACU), and few seed bittercress (*Cardamine oligosperma*: FAC), with patches of western mannagrass (*Glyceria occidentalis*: OBL) observed in the northern ditch.

Very little dead or downed wood is present on the site; the only observed pieces of dead wood included a few tall cottonwood snags and scattered limbs in the ash forested habitats, primarily associated with the East Branch of Coyote Creek.

3.3 Soils

The Coyote Prairie site is mapped on Lane County Soil Survey sheet #90. The vast majority of the site is mapped with soil type #85 Natroy silty clay loam. A small area of soil type #105A Pengra silt loam and a small area of soil type #102C Panther silty clay loam are mapped in the far southern portion of the site, and a band of #102C Panther is along the northeast edge of the site. All three soil types are listed as hydric soils in the Lane County Hydric Soil List.

The Natroy series is described as a deep poorly drained soil in depressional areas on terraces and fans. These soils formed in mixed fine alluvium. Typically the surface layer is very dark grayish brown silty clay (10YR 3/2) about 5 inches thick, the next layer is very dark gray clay (10YR 3/1) about 21 inches thick, and the substratum to a depth of 60 inches or more is dark grayish brown 10YR 4/2), brown to dark brown (10YR 4/3) clay and gravelly clay. It is subject to frequent flooding over long durations between November and May, with a perched water table at +1 to -1 feet deep. Depth to bedrock is more than 60 inches, and in summer the soil cracks.

The Pengra series is described as a deep, somewhat poorly drained soil on toe slopes and fans, formed in stratified alluvium. It is described typically with a surface layer that is very dark grayish brown silt loam about 6 inches thick, with a very dark gray brown and dark gray brown subsoil that is a mottled silty clay loam about 15 inches thick. The substratum to a depth of 60 inches or more is a very dark gray brown and dark gray brown mottled clay. A typical profile is described as 0-6 inches: very dark grayish brown (10YR 3/2 moist) silt loam; 6-13 inches: very dark grayish brown (10YR 3/2 moist) silty clay loam with few fine distinct yellow brown (10YR 5/6) mottles; 13-21 inches: dark gray brown (2.5Y 4/2 moist) silty clay loam with many distinct yellow brown (10YR 5/6) mottles; 21-36 inches: very dark gray brown (2.5Y 3/2 moist) clay; 36-60 inches: dark gray brown (2.5Y 4/2 moist) clay. Permeability is slow. A perched high water table is at a depth of 1.5 feet-2.5 feet in November to May. Depth to bedrock is over 60 inches.

The Panther series is described as deep, poorly drained soils in swales and on small benches of foothills adjacent to the valleys of the Willamette River and its tributaries. These soils formed in colluvium and residuum derived from sedimentary and basic igneous rock. The typical soil profile is 0-10 inches: very dark brown (10YR 2/2 moist) silty clay loam, 10-16 inches: very dark grayish brown (10YR 3/2 moist) clay, 16-29 inches: dark grayish brown (2.5Y 4/2 moist) clay

with common fine distinct strong brown (7.6YR 5/6 moist) mottles. Depth to bedrock is 40-60 inches. It is described as having a perched water table at a depth of 0-1 foot from December to April, with no flooding.

The soils in the agricultural fields were observed to be a silty clay or silty clay loam ranging in depth from 3-10 inches, over a dense clay layer. These soils had a visible plow layer at 8-10 inches, with mixing including some of the clay subsurface layer, within the top 10 inches, however indicators of hydric soils such as mottling in the top 10 inches were evident in many of the soil profiles. Other indicators of hydric soil conditions were a chroma of 1 in the top 10 inches. The majority of observed soils were darker than either of the three mapped for the site, typically with a chroma of 1 instead of 2 as described for the Natroy, Pengra, and Panther series, however that may be due in part of frequent plowing and mixing which would pull up darker deeper layers, the addition of burned material during plowing, and the addition of fertilizers. Soils observed in the ash forested unmanaged areas were typical of an undisturbed Natroy silt loam with a silty clay loam having a chroma of 2 in the top 6-8 inches, over a mottled clay layer below 6-8 inches.

Soils observed in the very south portion of the site were a silty clay loam with a chroma of 2 and mottling, similar that that described for the Panther and Pengra series mapped for that portion of the site. A layer of crushed rock was observed in the field at near the south site boundary, approximately 25 feet north of the fenceline. Soils observed in the oak woodland in the southeast portion of the site were a silty clay loam with a chroma of 2 over clay at 11 inches, however no mottling was observed in the 16-inch profile, therefore the oak woodland did not meet the criteria for hydric soils. The same upland soil conditions were observed in a plot (2-3) in the grass field north of the oak woodland by about 100 feet.

3.4 Hydrology

The entire site, with the exception of a small area in the southeast corner, was observed to be either inundated or saturated in the top 12 inches of the surface during the March site visits. The middle of the site did not exhibit wetland hydrology characteristics during the February 24 site visit. Although precipitation was above normal for the year, little rain had fallen in the month of February prior to that site visit, and precipitation for the month was at 21% of normal. The early March site visits were scheduled during a period of rainfall, although rainfall for the month was still at 26% of normal, however hydrology characteristics had changed across the site including the middle of the site such that soils were either inundated or saturated in the top 12 inches during those early March site visits. Only Plots 2-1 and 2-3, in the southeast corner of the site, did not exhibit wetland hydrology indicators: these soils were only damp and not saturated in the top 16 inches.

The majority of the site was inundated during the March site visits, with depths of inundation ranging up to 6 inches in deeper depressional areas especially in the northwest portion of the site. The southern field was wetter than the northern field, with inundation observed across almost the entire field during the February 24 site visit compared to the northern field which had large areas that lacked surface inundation but were saturated in the top 12 inches at that time. Hydrology appears to be determined by precipitation, and surface and subsurface flows, with a perched water table created by the shallow clay layer that impedes permeability.

One ditch crosses the north field that directs water entering from the east boundary down to a ditch on the north side of the ash forested strip across the southern portion of the site. Water is also ditched from the east site boundary just north of the ash forest strip that crosses the southern portion of the site, north of the East Branch of Coyote Creek. These two ditches are approximately 10 feet across the top of the banks, with a 2-foot channel bottom width and a depth of 1-3 feet. These ditches were carrying water 3-6 inches deep during the February and March site visits. The East Branch of Coyote Creek is wider, and was carrying water 8 inches deep during the February site visit. Portions of the bottom substrate in the ditches and creek were pebbly.

Evidence of surface runoff was observed in the recently seeded fescue field in the northeast corner of the site: shallow rivulets and drainage patterns extended from the east across that portion of the field.

3.5 National Wetland Inventory Mapping

The National Wetland Inventory mapping shows the East Branch of Coyote Creek crossing the south portion of the site; this feature is mapped as Cowardin class PFOC (palustrine forested seasonally flooded). It also shows several small depressional features in the northwest portion of the site, mapped as Cowardin class PEMAd (palustrine emergent temporarily flooded, partially drained/ditched).

3.6 Historic Uses

Based on information from the available historic aerial photos beginning in 1936 (refer to Figures 7-15), the site appears to have been used for pasture from 1936 through sometime after 1968, as the 1977 photo is the earliest photo that shows cropping. The power lines are first evident on the site in the 1968 photo. The ditch that runs from the east boundary to the southwest portion of the site is first visible in the 1997 photo, however the east portion of the drainage is visible as either a partially ditched or natural drainageway in the 1952 photo. In all photos, a shrub-forested habitat borders the East Branch of Coyote Creek as it crosses the south portion of the site.

3.7 Adjacent Uses

Surrounding uses to the Coyote Prairie site include Cantrell Road and agricultural fields to the north, agricultural fields and vacant ash forest to the west, pasture field to the south, and agricultural field to the east.

3.8 Wetland Determination

Based on review of available information and from observations during the field visits, it is my professional opinion that positive indicators of wetlands are present in the project area, as specified in the 1987 US Army Corps of Engineers Wetlands Delineation Manual and supported by all Plots in transects 1 through 6, with the exception of Plots 2-1 and 2-3. The onsite wetland area is approximately 237.73 acres in size, with approximately 218.9 acres as agriculturally degraded wetlands in the palustrine emergent (PEM) Cowardin class, 12.02 acres as PEM wetlands that are not managed for agricultural production, and 4.71 acres as palustrine forested (PFO) wetlands that are not managed for agricultural production.

Based on the site topography and observed hydrology features, the Coyote Prairie site is in the Slope/Flats Hydrogeomorphic (HGM) assessment class, with its primarily source of hydrology

from precipitation, and surface and subsurface runoff. A shallow clay layer impedes infiltration and enables a perched water table to form in the top 18 inches across the majority of the site.

3.9 Wildlife Use

Wildlife habitat is limited across the majority of the site because of its conversion to a ryegrass monoculture, with disturbance activities associated with the management of these fields for agricultural production as mentioned previously, include plowing in late summer, seeding in fall, application of agricultural chemicals including herbicides and fertilizer in spring and summer to maximize production and ensure seed purity, and mowing, harvesting, and baling in summer. Of the three necessary habitat components needed by wildlife – food, water and cover – grass seed production fields typically offer little cover or food, and in this case, only seasonal water. Intensive management activities associated with maintaining a monoculture crop, as described above, further reduce habitat potential.

Agricultural fields in the southern Willamette Valley are typically used by wintering and migrating waterfowl (e.g., tundra swans, Canada geese, and American widgeon), which feed on grain seed (if available) and small invertebrates, and provide a prey source for bald eagles and other predators. The portions of the fields nearest the forest and woodland habitats are probably used more than the open fields because the shrub-forest habitat provides cover and more nesting opportunities. Drainage ditches and the East Branch of Coyote Creek offer seasonal water for these animals as well as for reptiles, amphibians, insects and other invertebrate life.

Wildlife species observed during the February and March site visits were primarily birds, including killdeer, snipe, red-tailed hawk, harrier, bald eagle, white-tailed kite, meadowlark, white-crowned sparrow, savannah sparrow, and violet-green swallow. Coyote sign was observed in the openings near the East Branch of Coyote Creek, and a red-legged frog was observed in the creek.

4.0 WETLAND FUNCTION ASSESSMENT

Of the 13 wetland functions assessed with the Willamette Valley Guidebook (Adamus and Field 2001), nine are applicable to the Coyote Prairie site. These include water storage and delay, sediment stabilization and phosphorus retention, nitrogen removal, primary production, invertebrate habitat support, amphibian and turtle habitat, wintering and migratory waterbird support, songbird habitat support, and support of characteristic vegetation. The thermoregulation and anadromous fish support functions were not assessed because the onsite wetland does not contain permanent water nor is it accessible to anadromous fish. The breeding waterbird support function was not evaluated because the onsite wetland area does not contain areas of open stagnant water into July to support breeding waterbirds. Coyote Creek does contain resident fish including cutthroat trout, therefore it is likely that the East Branch may contain fish when it is flowing water and accessible to Coyote Creek. However, the Willamette Valley Assessment Method explicitly states that the resident fish habitat support function is to be assessed only if part of the site is permanently inundated and in the Riverine Impounded subclass, for both the Reference-based and Judgmental methods.

As stated previously, the Highest-Functioning Standard was used for the wetland function assessment, as the site has been altered significantly from natural conditions by conversion to

agricultural use such that the Least-Altered Standard was not considered appropriate. The numerical scores for the 9 wetland functions evaluated for the Coyote Prairie site range from a low of 0 to a high of 1. Scores between 0 and 0.30 are considered low, scores from 0.31-0.75 are considered moderate, and scores above 0.75 are considered high.

For the most part, the Coyote Prairie site is functioning at a low to moderate level for both physical and biological wetland functions because the vast majority of the site has been converted an intensively-managed monoculture cropland. Associated activities including plowing, soil leveling, seeding of a monoculture species, spraying with herbicide to control competitive species, addition of fertilizers to stimulate plant growth, harvesting, and burning, all of which limit the capacity of the wetland to provide both physical/chemical and biological functions when compared to less disturbed wetland sites with a diversity of plant species, plant communities, and vegetation structure. In addition, past plowing and soil leveling practices have reduced the subtle microtopographic features typical of native wet prairie habitats including hummocks. The hummocky microtopography of native wet prairies provides greater diversity of habitat niches for invertebrates and amphibians. Other limiting factors include the large area surrounding the site that is also managed for agricultural production or used for pasture, as these habitats are dominated with nonnative species and provide limited wildlife habitat.

Positive factors on the Coyote Prairie site include regular harvesting of the grass crop followed by burning of the site prior to reseeding every year, which provides an increased nitrogen removal function by physically removing the vegetation matter. The soil across the site is heavy in clay, which is less erodable than other soil types, and therefore is a positive factor for the sediment stabilization function. The bare ponded areas on the site in winter, before the grass crop has begun to actively grow, are similar to mudflats or vernal pools, and provide foraging habitat for wintering waterbirds. Other favorable factors include the relative absence in the watershed of urban development with its associated impervious surface, as most of the watershed with the exception of Veneta is in a rural residential or agricultural and pasture use. Therefore, wetlands in the watershed can provide physical functions at a high level including water storage and delay, sediment stabilization, nitrogen removal, and phosphorus retention, compared to a more urban environment.

Table 1: HGM Assessment of Wetland Functions for the Coyote Prairie Site

HGM Functions	Function Score for Coyote Prairie S/F Wetland Area
Water storage and delay	0.25
Sediment stabilization and phosphorus retention	0.79
Nitrogen removal	0.74
Thermoregulation	-
Primary production	0.37
Resident fish habitat support	-
Anadromous fish habitat support	-
Invertebrate habitat support	0.26
Amphibian and turtle habitat	0.42
Breeding waterbird support	-

HGM Functions	Function Score for Coyote Prairie S/F Wetland Area
Wintering and migratory waterbird support	0.75
Songbird habitat support	0.59
Support of characteristic vegetation	0.55

Note: The "—" indicated functions not evaluated because of lack of appropriate site characteristics such as permanent water.

4.1 Water Storage and Delay

The Water Storage and Delay function refers to the ability of a wetland to store or delay downslope movement of surface water. The factors evaluated for this function include the area of seasonal inundation and the predominant depth of seasonal inundation. The Coyote Prairie wetland scored at a low level for this function because although the majority of the site is seasonally inundated, the predominant depth appears to be 1 inch, and therefore the volume of water the site is able to store is relatively low.

4.2 Sediment Stabilization and Phosphorus Retention

The Sediment Stabilization and Phosphorus Retention function refers to the capacity of a wetland to intercept suspended inorganic sediments, reduce water velocity, resist erosion, minimize down slope erosion, and/or retain any forms of phosphorus. Factors important to the performance of this function include the ability of a wetland to store or delay runoff, soil texture heavy in clay, a high amount vegetation cover and diversity of vegetation cover types, a long amount of time that water is in contact with vegetation, microtopographic relief (i.e., hummocks), and an absence of past soil disturbances such as compaction, leveling, plowing that can have a negative effect on a wetland's ability to perform this function. The Coyote Prairie wetland scored at a high level for this function primarily because of the number of ponded areas during winter high water periods, the high clay content in the soils, and the complete vegetation cover in the wetland area during summer. Limiting factors on the Coyote Prairie site that negatively affect the score include the lack of hummocks from leveling and plowing, the low water storage and delay capacity, and the significant amount of site disturbance in the form of compaction, leveling, and plowing.

4.3 Nitrogen Removal

The Nitrogen Removal function refers to the capacity of a wetland to remove nitrogen from water and sediments by supporting the temporary uptake of nitrogen by plants and/or denitrification of nongaseous forms of nitrogen by microbial organisms. Factors that influence this function include distribution of seasonally inundated areas with fluctuating water levels, soil porosity (absence of soil compaction), availability of organic carbon (mature trees and dead wood), the presence of ponding and/or hummocks (and lack of leveling activities), and regular burning or harvesting to remove nitrogen through vegetation removal. The Coyote Prairie wetland scored moderately high for this function because of the large area of seasonal inundation and regular burning and harvesting activities. Onsite limiting factors for this function include the lack of hummocks and microtopographic relief from soil leveling activities, the limited capacity to store water and delay runoff, the absence of mature trees and downed wood, and the predominantly shallowly fluctuating area of inundation.

4.4 Primary Production

The Primary Production function measures the area of vegetation cover, as the ability to convert

sunlight to organic matter through photosynthesis. This function is positively affected by a diversity of plant forms (herbaceous cover, shrubs, and trees), a high degree of patchiness among plant forms, the presence of ponding, and soil moisture into late summer. Factors that negatively affect this function include soil compaction, permanent water deeper than 3 feet, unnatural disturbance within the contributing watershed such as pavement, cropland, and buildings, and the presence of unvegetated areas in the site. The Coyote Prairie wetland scored at a moderate level for this function because although it is fully vegetated during summer and contains some shrub and tree habitats, it is limited by the conversion to a monoculture crop, the lack of hummocks as a result of soil leveling, the absence of pools during summer and fall, and the large area of cropland in the adjacent landscape.

4.5 Invertebrate Habitat Support

The Invertebrate Habitat Support function refers to the ability of a wetland to provide habitat suitable for local invertebrate species, including permanently and seasonally inundated areas, presence of pools with inwater vegetation, the presence of microtopographic relief including hummocks and puddles, and a diversity of plant forms. Factors that have a negative effect on this function include the extent of soil compaction and leveling, poor water quality, and conversion of natural land cover to cropland or urban development in the surrounding watershed. The Coyote Prairie site scored at a low level for this function because although pools are present during winter and spring high water periods, the site lacks permanent water, historic mocrotopographic features such as hummocks have been removed during mechanical soil leveling, and it has been subject to soil compaction activities as a result of agricultural production management.

4.6 Amphibian and Turtle Habitat

The Amphibian and Turtle Habitat function describes the capacity of a wetland to provide habitat suitable for native amphibians such as frogs, as well as turtles. Positive factors include shallow pools with stable water during spring, the availability of flexible, thin-stemmed herbaceous vegetation for egg attachment sites, year-round partially submerged vegetation, protruding logs or boulders for basking and calling sites, and rotting wood and a thick organic soil layer which provides habitat for many salamander species. Seasonally inundated areas provide refugia in sites near bullfrog or fish habitat, as bullfrogs and fish are a key predators of amphibians. Factors that have a negative effect on this function include soil compaction, obstructions to travel such as heavily used roads, permanent surface water that contains predatory fish and bullfrogs, unstable water levels and substrate due to runoff and erosion from adjacent developed lands, and an absence of forested cover. The Coyote Prairie wetland scored at a moderate level for this function because although pools are present in winter and spring, the majority of the site is covered with herbaceous species, and no busy roads are near the site, it is limited by the lack of potential egg attachment vegetation in the pools because they are located predominantly within the ryegrass fields, the lack of microtopographic relief from past soil leveling activities, the lack of logs or boulders protruding above the surface of the seasonal pools, a paucity of dead wood, the presence of a single herbaceous vegetation form due to management as a monoculture, the lack of permanent water, and the predominance of cropland in the surrounding landscape. An additional negative factor is the regular use of herbicides across the site to control competitive weedy species, which has been documented to have a negative effect on amphibians.

4.7 Wintering and Migratory Waterbird Support

The Wintering and Migratory Waterbird Support function describes to the capacity of a wetland

to provide habitat that supports local waterbird species in fall, winter, and/or spring. Positive factors include seasonal ponding, especially as vernal pools, seasonally bare areas including mudflats or vernal pools, a variety of water depths, fluctuating water levels, and the presence of wetlands and open water features in the surrounding landscape. The Coyote Prairie wetland scored at a high level for this function because although no permanent water is present and the seasonal water level is relatively shallow, large seasonally inundated and bare areas are present in the grass field in winter and early spring before the ryegrass grows up, and the surrounding land cover includes a high percent of wetlands and grasslands.

4.8 Songbird Habitat Support

The Songbird Habitat Support function describes the capacity of a wetland to provide habitat for native visiting and breeding non-waterbird species. Positive factors include permanent water with large areas of closed-canopy forest, large diameter trees, abundant snags in a variety of sizes and decay conditions, an extensive understory, and a variety of shrub and herbaceous understory species or a large area of native shrubland, wet prairie, and/or emergent wetland with a variety of herbaceous species and patches of trees or shrubs. Negative factors include surrounding development and associated human disturbance activities, a high amount of human visitation to the site, and the presence of busy roads in the near vicinity. The Coyote Prairie site scored at a moderate level for this function because it is almost entirely vegetated in spring and summer before it is harvested, some wooded habitat is present on the site and adjacent landscape, and there is a predominance of wetland and grassland in the surrounding landscape, however the site is limited by the small area of woodland in the vicinity, the lack of permanent water, the paucity of dead wood, the relatively high frequency of human disturbance activities associated with management for agricultural production including plowing, spraying, harvesting, and mowing.

4.9 Support of Characteristic Vegetation

The Support of Characteristic Vegetation function describes a wetland's capacity to support native plants and plant communities. Factors that influence this function include the amount, structure, and re-colonization potential of native vegetation on the site, the diversity of native vegetation species and cover types, microtopographic relief, and the amount of human disturbance activities on the site (plowing and compaction) as well as in the surrounding landscape (urbanization, cropland). The Coyote Prairie wetland scored at a moderate level for this function because although it is almost entirely vegetated in spring and summer before harvest, and the surrounding landscape has not been significantly urbanized, much of the site and surrounding landscape has been converted to nonnative plant species through agriculture production or pasture use, resulting in a paucity of native species and vegetation cover types, which are limited to a predominantly single herbaceous layer maintained in a monoculture condition due to agricultural management.

5.0 WETLAND VALUE ASSESSMENT

The wetland value assessment is based on present conditions, and takes into account the condition of the contributing watershed. All 9 functions evaluated with the function assessment were also rated for their value on the site and in the context of the Coyote Creek watershed. The Coyote Prairie site is one of the more degraded sites in the predominantly rural watershed, because of the land alteration and intensive management practices associated with agricultural production. The more natural areas within the site have a higher ecological value relative to the site and

surrounding areas because of the greater wildlife habitat and plant diversity opportunities offered by these small islands within the larger grass fields.

Factors that have a negative effect on the value of the Coyote Prairie wetlands include the predominantly natural or pasture condition of the contributing watershed, with a greater diversity of vegetation species and cover type and therefore associated ecological values compared to the Coyote Prairie site which is managed for a monoculture crop. Additional negative factors affecting the Coyote Prairie wetland values relative to the watershed result from its management for agricultural production. Agricultural management activities that have a negative effect on the ecological, social, and economic value of the Coyote Prairie wetlands include increased soil loss as a result of regular plowing, increased runoff of herbicides and fertilizers into ditches, increased runoff in constructed ditches, and its attractiveness to Canada geese that can be detrimental to crop production on the site and in the area. In addition, because of its predominant agricultural condition, the Coyote Prairie site is not a unique area, it does not support rare local wildlife, fish, or plant species.

The majority of wetland values for the Coyote Prairie site were at a low to moderate because the site does not have the capacity at the present time to perform a high degree of the wetland functions. One exception is the value of the nitrogen removal function, which scored at a moderate level because cropping is an effective way to remove nitrogen buildup in plant tissue, which is an important function when evaluated in relation to the nitrogen-rich fertilizers and resulting runoff on the site and surrounding cropland.

The numerical scores for the 9 wetland values evaluated for the Coyote Prairie site range from a low of 0 to a high of 1. Scores between 0 and 0.30 are considered low, scores from 0.31-0.75 are considered moderate, and scores above 0.75 are considered high.

Table 2: HGM Assessment of Wetland Values for the Coyote Prairie Site

HGM Functions	Value Score for Coyote Prairie S/F Wetland Area
Water storage and delay	0.3
Sediment stabilization and phosphorus retention	0.5
Nitrogen removal	0.5
Thermoregulation	-
Primary production	0.5
Resident fish habitat support	-
Anadromous fish habitat support	-
Invertebrate habitat support	0.3
Amphibian and turtle habitat	0.2
Breeding waterbird support	-
Wintering and migratory waterbird support	0.3
Songbird habitat support	0.2
Support of characteristic vegetation	0.1

Note: The "—" indicated functions not evaluated because of lack of appropriate site characteristics such as permanent water.

5.1 Water Storage and Delay

The value of the Water Storage and Delay function is low at the present time, because although the Coyote Prairie site is large, it is located within a contributing watershed that is relatively flat and not significantly urbanized, therefore there is much opportunity in the contributing watershed to provide water storage and delay function.

5.2 Sediment Stabilization and Phosphorus Retention

The value of the Sediment Stabilization and Phosphorus Retention function is moderate because the Coyote Prairie site is able to stabilize some sediment because it is flat, which is an important ecological and economic value. In addition, it provides some phosphorus retention by plant uptake and removal from the system by harvesting. These opportunities are significant to the watershed because of the inputs to Coyote Creek and other nearby waterbodies from adjacent cropland and pasture land including fertilizers, sediment, and herbicides associated with agricultural management.

5.3 Nitrogen Removal

The value of the Nitrogen Removal function was rated at a moderate level, because cropping is an effective way to remove nitrogen buildup in plant tissue. This opportunity is significant when compared to the amount of nitrogen-rich fertilizers used on the site and surrounding cropland, and potential for resulting runoff high in nitrates which have a negative effect on water quality and therefore ecological, economic, and social value.

5.4 Primary Production

The value of the Primary Production function on the Coyote Prairie site is moderate, because although it is vegetated, the site in its present condition is not especially important to food webs onsite or downslope because of its predominant monoculture crop condition. As such, the site is not unique relative to the watershed; it is one of the more limited primary producers in the surrounding landscape because of its lack of vegetation diversity.

5.5 Invertebrate Habitat Support

The value of the Invertebrate Habitat Support function on the Coyote Prairie site is low, because although it is vegetated, it is presently managed for a monoculture crop which greatly diminishes its suitability as invertebrate habitat, due to frequent soil disturbance, chemical use, seasonal devegetation. The landscape to the south and west, as well as the majority of landscape within the watershed, provides far greater opportunities for invertebrate habitat because of their greater plant species, microtopographic, and plant community diversity inherent in pasture or unmanaged open space.

5.6 Amphibian and Turtle Habitat

The value of the Amphibian and Turtle Habitat function on the Coyote Prairie site is low, because although amphibians and turtles are present in the vicinity, the site is managed for a monoculture crop which severely limits its opportunity to provide habitat for amphibians and turtles, especially in comparison to the less intensively managed and more natural landscapes in the watershed. The regular use of herbicides and fertilizers on the site that negatively affects water quality onsite and downslope has a potential adverse effect on amphibian habitat, thereby reducing the ecological value of the site for this function.

5.7 Wintering and Migratory Waterbird Support

The value of the wintering and migratory waterbird support function on the Coyote Prairie site is low because its management for a monoculture grass crop results in a paucity of habitat qualities necessary for waterbirds in fall through spring, relative to more natural and diverse waterbodies in the watershed including Fern Ridge Reservoir. In addition, the primary waterbird that favors grass fields such as the Coyote Prairie site are Canada geese, which can be detrimental to crop production and have a negative effect on economic value on the site and in the surrounding area.

5.8 Songbird Habitat Support

The value of the songbird habitat function in the Coyote Prairie site is low because of the lack of habitat for songbirds in the monoculture landscape, and therefore the lack of importance of the site to local songbirds, especially in relation to less intensively managed and more natural landscapes in the watershed.

5.9 Support of Characteristic Vegetation

The value of the characteristic vegetation function for the Coyote Prairie site is low because it is one of the more ecologically degraded landscapes in the watershed such that it does not provide an opportunity for establishment of native prairie plant communities at the present time.

_____ _____

Nancy Holzhauser Date
Ecologist

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Insert Figure 6: Delineation Map

(11 x 17)