



*Marsh Wren*



*Coyote-Spencer Wetland*



*Environmental Leadership Program Students*



# *West Eugene Wetlands Annual Report 2012*

*Golden Paintbrush*

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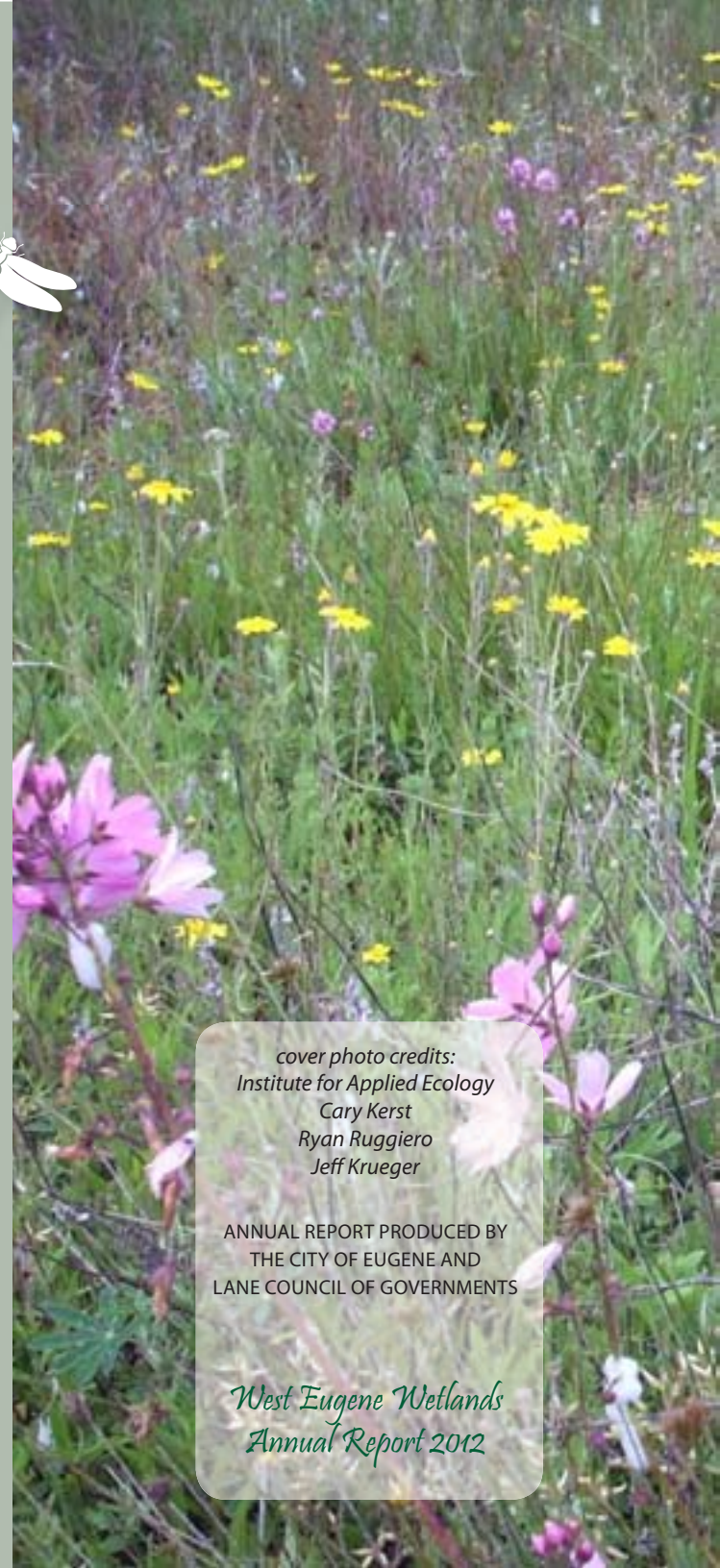
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ANNUAL REPORT PRODUCED BY  
THE CITY OF EUGENE AND  
LANE COUNCIL OF GOVERNMENTS

*West Eugene Wetlands  
Annual Report 2012*





# 1.0 Administrative and Planning Summary

## 1.0 ADMINISTRATIVE STRUCTURE AND SUMMARY OF ACTIVITIES

### R2R Partnership Organizations

- City of Eugene
- Friends of Buford Park and Mount Pisgah
- Lane County Public Works Department
  - Long Tom Watershed Council
  - McKenzie River Trust
- Oregon Department of Fish and Wildlife
- Oregon Parks and Recreation Department
  - Oregon Youth Conservation Corps
    - The Nature Conservancy
    - U.S. Army Corps of Engineers
    - U.S. Bureau of Land Management
    - U.S. Fish and Wildlife Service
- Willamalane Park and Recreation District
- Willamette Resources and Educational Network

Beginning in 2010, the Rivers to Ridges (R2R) Partnership took over the administrative function that had been in place under the WEW Partnership, with 2011 and 2012 marking the first two years under this new structure. While the R2R Partnership now covers a much broader geographic area, the West Eugene Wetlands continues to be an important sub-region of the conservation area. Thus, a separate West Eugene Wetlands Annual Report is being produced as a way of providing continuity and tracking of activities that have occurred in the West Eugene Wetlands since the Plan was adopted in 1992. The Rivers to Ridges Partnership now includes a total of 14 organizations (left).

### 1.1 Rivers to Ridges Executive Team (R2R XT)

The Rivers to Ridges Executive Team met for the third time under the new Statement of Partnership in October, 2012. The function of the Executive Team is to guide management of the regional open space system, including the West Eugene Wetlands, in a cooperative manner. The team includes at least one executive representative from each of the 14 members of the R2R Partnership and typically meets once annually. This year's meeting was hosted by the City of Eugene and facilitated by Chris Orsinger from the Friends of Buford Park & Mount Pisgah. The meeting included a presentation of major open space accomplishments by R2R Partners since the R2R vision was completed in 2003, adoption of the Rivers to Ridges logo (left), review of the organizational structure, and a decision to move forward with the development of a R2R website. In addition, an award presentation was made during the meeting to Philip Bayles of RaptorViews (next page) on behalf of the Oregon Recreation and Parks Association Natural Resource Section for Outstanding Contribution to the Natural Resources Field. Philip has worked as an unpaid volunteer collecting low elevation oblique aerial photos of many of the regions natural areas for many of the R2R partners.

### 1.2 Rivers to Ridges Implementation Team (iT!)

The Implementation Team (iT!) includes manager level representatives from each of the Rivers to Ridges partner organizations. This group coordinates to provide broad oversight for implementation of the objectives of the River to Ridges Vision.

The iT! met four times in 2012 and meetings continue to be marked by good attendance from the R2R partners and productive discussions. Typical agenda items in 2012 included topics such as collaborative





*FOG Site Visit  
to the McKenzie River Trust  
Spencer-Coyote Wetlands*

funding and grants, mapping, education, recreation, updates on habitat restoration projects, and development of a web site.

### **1.3 R2R Field Operations Group**

The Field Operations Group (FOG) is a multi-jurisdictional team that typically meets once monthly to coordinate on-the-ground activities and share technical information and experience. FOG had historically focused on coordinating efforts related to the WEW Program, but in recent years has also focused on upland and river related restoration and enhancement projects throughout the region. Much of the coordination role of FOG has been delegated to subcommittees with general meetings dedicated to guest lectures, trainings, or site visits. The Nature Conservancy scheduled and facilitated the 2012 FOG meetings, which included the following:

- Presentation by Sarah Marshall of OSU on her research in hydrologic comparison of farmed sites versus restored and remnant prairie sites.
- Presentation by Ed Alverson of TNC on “Identifying Priority Willamette Valley Oak and Prairie Habitat – Final Phase”; and Dave Vesely of the Oregon Wildlife Institute on “Monitoring Bird Response to Habitat Restoration: Can We Afford Not to Do It?”
- Presentation by Alexa Carlton from WSU-Vancouver on “Egg-Laying Habits of Fender’s Blue Butterfly Across a Restoration Chronosequence in the Willamette Valley”, and Matt Gibbons from TNC on “Tracking Stewardship With a Geodatabase”.
- Field trip to the Spencer-Coyote Wetlands to view the recent MRT acquisition and discuss future management.
- Field trip of South Eugene Meadows to view the recent City of Eugene acquisition and discuss future management (City of Eugene)
- Field trip to Rose Prairie to view the results of the 2011 prescribed fire and discuss an experiment on the effects of post-fire application of herbicide (Andrea Thorpe, Institute for Applied Ecology).
- Field trip to the TNC Coburg Ridge Preserve to tour areas of OWEB funded oak and prairie restoration (TNC).
- Presentation by Philip Bayles of RaptorViews titled “Jewels on the Necklace”.



## ***Philip Bayles of Raptor Views Acknowledged by R2R XT***



*Photo credit: Brandi Ferguson (MRT)*

Philip Bayles of Eugene, has long been a remote controlled airplane hobbyist, often flying in local parks and recording his flights with a nose mounted flip camera. Beginning in 2010, Philip turned this hobby into a useful tool for conservation and habitat restoration projects by taking outstanding low elevation oblique aerial photos and making them available for general use. In his first project, Philip provided hundreds of photos of the McKenzie River Trust's Green Island property along the Willamette River for use in a habitat management plan and to document several major flood events. Word quickly spread, and Philip, working as an unpaid volunteer, has photographed numerous other natural areas for Rivers to Ridges partners. Philip now flies under the name "RaptorViews" and continues to make valuable contributions to conservation and restoration efforts in the area. To learn more, go to <http://www.raptorviews.com/>.

Several subcommittees meet as needed to help coordinate specific aspects of FOG. These include:

- **SPROUTs** (Seeds, Plugs, Rhizomes, or Underground Tubers): This committee meets on an ad-hoc basis to develop and coordinate the R2R Partnership's native plant materials program.
- **Prescribed Fire**: This committee meets on an ad-hoc basis to coordinate and plan the annual ecological burn program.
- **Science**: This committee was established to review germane scientific information, prioritize future research projects, and provide a forum for information sharing around scientific research. Recently this group has focused its efforts on the development of a coordinated recovery plan for the four federally listed species found in West Eugene.



*Photo credit: RaptorViews*

*Raptor Views Photo of Amazon Creek in West Eugene*



## 2.0 WEST EUGENE WETLANDS IMPLEMENTATION EFFORTS

### Annual Credit Sales for WEW Mitigation Bank

	Credits Sold
1994	7.29
1995	1.50
1996	2.71
1997	15.03
1998	9.55
1999	7.85
2000	5.09
2001	7.40
2002	7.73
2003	3.10
2004	12.19
2005	2.20
2006	4.06
2007	4.03
2008	14.11
2009	2.05
2010	4.20
2011	0.18
2012	0.00
<b>Total</b>	<b>110.27</b>

### Annual Credit Sales for Coyote Prairie North Mitigation Bank

	Credits Sold
2011	0.00
2012	0.71
<b>Total:</b>	<b>0.71</b>



### 2.1 Wetlands Mitigation Banks

The City of Eugene currently operates two independent wetland mitigation banks within the West Eugene Wetlands area. Following the adoption of the West Eugene Wetlands Plan (Plan) in 1992, the West Eugene Wetlands Mitigation Bank was established with the goal of funding and implementing wetland restoration and enhancement activities outlined in the Plan. The WEW Mitigation Bank operates under a Memorandum of Understanding (MOU) between the City and State and Federal regulatory agencies that was signed in 1995. The WEW Mitigation Bank has had great success in restoring and enhancing hundreds of acres of City and BLM owned lands since that time. However, since 1995, a number of State and Federal regulatory and policy changes have occurred, prompting the City to establish a second mitigation bank to better comply with the new requirements. This second bank is known as the Coyote Prairie North Mitigation Bank. The new mitigation bank operates under updated guidelines and all new credits generated under the bank will be applied to the new bank's ledger. The WEW Mitigation Bank will also continue to exist and function under the original MOU, but no new credits will be added to its ledger. As existing credits are depleted, the WEW Bank will eventually sunset. Since its inception, the WEW Mitigation Bank has sold a total of 110 credits (see table). The new Coyote Prairie Mitigation Bank began operating in 2011, with the initial mitigation project being implemented on the northern side of Coyote Prairie.

In 2012, Coyote Prairie Phase 2 (39 acres) and the East Phase of Coyote Prairie North (84 acres; formerly called Phase 3) were the two remaining active phases of enhancement under these two mitigation banks. The City's activities at these sites included seeding, planting, weed management, erosion control, and monitoring (see Sections 2.1.1 and 2.1.2). Restoration and enhancement activities at all other Bank sites, and at Coyote Prairie Phase 1, are now considered complete, with mitigation credits having been certified. The wetland sites with certified credits are now relatively self-sustaining and their long-term maintenance has shifted to the site owner, either the City or BLM.

#### 2.1.1 Bank Monitoring Activities

The 2012 monitoring program tracked the progress and development of several mitigation projects under the management of the City's two mitigation banks. In the West Eugene Wetlands Mitigation Bank, a mitigation site receives qualitative assessments to document site hydrology, and wildlife use. In addition, two rounds of quantitative vegetation monitoring are conducted at two years and five years following project implementation. The fifth year monitoring results determine if the mitigation has been successful and if the site can be certified and the restoration considered complete and successful. If the site is not yet meeting its monitoring objectives after five years, subsequent rounds of enhancement and monitoring are conducted. In the Coyote Prairie North Mitigation Bank a mitiga-



Photo credit: The Nature Conservancy

## Coyote Prairie

North Mitigation Bank. The site's native vegetation is establishing well, including in the vernal pools where native annual plant species thrive. Monitoring of the newly created vernal pools in this phase also revealed that all pools supported aquatic invertebrates. Twelve of 16 vernal pools supported breeding Pacific chorus frogs in 2012 and at least 2 supported breeding long-toed salamanders. Short-eared owls, American kestrels, northern harriers, red shouldered hawks, and white-tailed kites have all been spotted hunting at Coyote Prairie in 2012. Elk tracks from a local herd crisscross the site in winter months and savanna sparrows have been observed nesting in the enhanced wetland prairie habitat in the spring.

tion site receives similar qualitative and quantitative assessments, except that the quantitative vegetation monitoring occurs annually in years 2 through 4.

In 2012, the fifth year vegetation monitoring was conducted at the Coyote Prairie Phase 2 enhancement area. Monitoring of this phase showed that the enhancement area has developed a rich and varied native flora, with high native plant cover. The City's control of non-native invasive plants was successful, although additional assessment and control of nonnative plants will continue. Camas that was seeded 5 years ago is now flowering in experimental plots, which were monitored this year by students from the University of Oregon's Environmental Leadership Program. Based on the monitoring results, Coyote Prairie Phase 2 has now met its enhancement objectives and will be certified and considered successfully enhanced.

Third year monitoring was also conducted at the East Phase of enhancement of the Coyote Prairie





*East Phase at Coyote Prairie*



### **2.1.2 Bank Maintenance Activities**

Bank maintenance activities in 2012 emphasized the two active phases at Coyote Prairie, with less intensive management occurring on other completed mitigation sites.

#### **Coyote Prairie Phase 2**

In 2012, Coyote Prairie Phase 2 was in its fifth and final restoration year and supports abundant and diverse native wetland prairie forbs and grasses as well as wetland hydrology. City staff and contractors used hand weeding and spot herbicide applications in locations where nonnative invasive plant species were establishing, as well as mowing to suppress ash tree seedlings that were colonizing the prairie. City staff re-seeded areas of disturbance due to activities associated with weed control. Success criteria for this site has been met and it will be fully certified this year, moving it into long-term maintenance mode with other “completed” mitigation sites. The vegetation has matured so that in 2013 it is scheduled to receive its first ecological burn.

#### **East Phase (previously referred to as Coyote Prairie Phase 3)**

Management activities to enhance the 84-acre East Phase of the Coyote Prairie North mitigation bank site continued for the third year in 2012. Contract crews and City staff spent several weeks hand pulling and spot spraying nonnative invasive species where they occurred, to allow native vegetation to more fully establish. City staff broadcast diverse native seed mixes containing forb, sedge, and rush species in areas of the site where control of nonnative species occurred. Ten small shrub islands composed of spirea, willow, service berry, and nootka rose were planted to increase cover and foraging habitat for native birds. Over 1,600 bare-root and potted plants of species such as Hall’s aster and narrow leaf mule’s ears plants were introduced into this phase to enhance native diversity and establish plants important for native bees and birds that are difficult to establish from seed.

The vernal pools that restoration staff had created in the project area in 2009 continue to support robust populations of native annual forbs typical of shallow wetlands that are inundated in the winter but retain some water through much of the spring. Small diameter cobble and coir logs installed in previous years to reinforce and disperse the erosive forces of seasonal rains appear to be functioning well, halting erosion and allowing vegetation to take hold. In addition to the 27 logs that were installed in the East Phase previously, approximately one dozen large logs were placed in the southeast region of this phase for amphibian refugia and other wildlife benefits in 2012. Several acres of the East Phase were mowed in an irregular pattern to facilitate the establishment of forb species in areas dense with rush species. Additional actions to manage vegetation in all phases of enhancement at Coyote Prairie will continue in 2013.



## 2.2 LAND ACQUISITIONS AND EASEMENTS

In 2012, two significant acquisitions along the Coyote Creek corridor added an additional 471.7 acres to the conservation land base in the WEW area. In addition, the City of Eugene took ownership of the Salawa Meadow property, which had been formerly owned by ODOT and previously served as a wetland mitigation site.



Photo credit: Ryan Ruggiero

*Coyote-Spencer Wetland Property*

### **2.2.1 Coyote-Spencer Wetland Acquisition**

Located at the confluence of Coyote and Spencer Creeks, the 161-acre Coyote-Spencer Wetland property contains over three miles of streams and a mix of riparian forest and wet meadows. The exceptional variety of native plants on the property can be found in few other places in the Willamette Valley. McKenzie River Trust purchased this property in March 2012 with the support of Oregon Department of State lands and USFWS through a North American Wetlands Conservation Act grant.

### **2.2.2 Coyote Creek Acquisition**

The 310.7-acre Coyote Creek property was purchased in 2012 by The Nature Conservancy and lies immediately west of the City owned Coyote Prairie property and south of the ODFW managed Fern Ridge Wildlife Area. TNC purchased the property with the intent of eventually transferring ownership to ODFW if funding is approved. The property consists of approximately 100 acres of riparian forest and forested wetland and 210 acres of restorable wetland prairie, which is currently in agricultural use. This acquisition preserves a critical link between other nearby public conservation lands.

### **2.2.3 Salawa Meadow Land Transfer**

In 2012, the City of Eugene took ownership the Salawa Meadow property, which had previously been owned and restored by ODOT for wetland mitigation. The property, which lies immediately to the west of Stewart Pond and south of Bertelsen Slough, will be integrated into the larger Bertelsen Nature Park and managed by the City. This land transfer served as mitigation for Land and Water Conservation Fund 6(f) impacts in Alton Baker Park related to the construction of the I-5 bridge over the Willamette River. In 2010, the 28-acre Bertelsen Slough property had been transferred from ODOT to the City under the same I-5 bridge mitigation agreement.

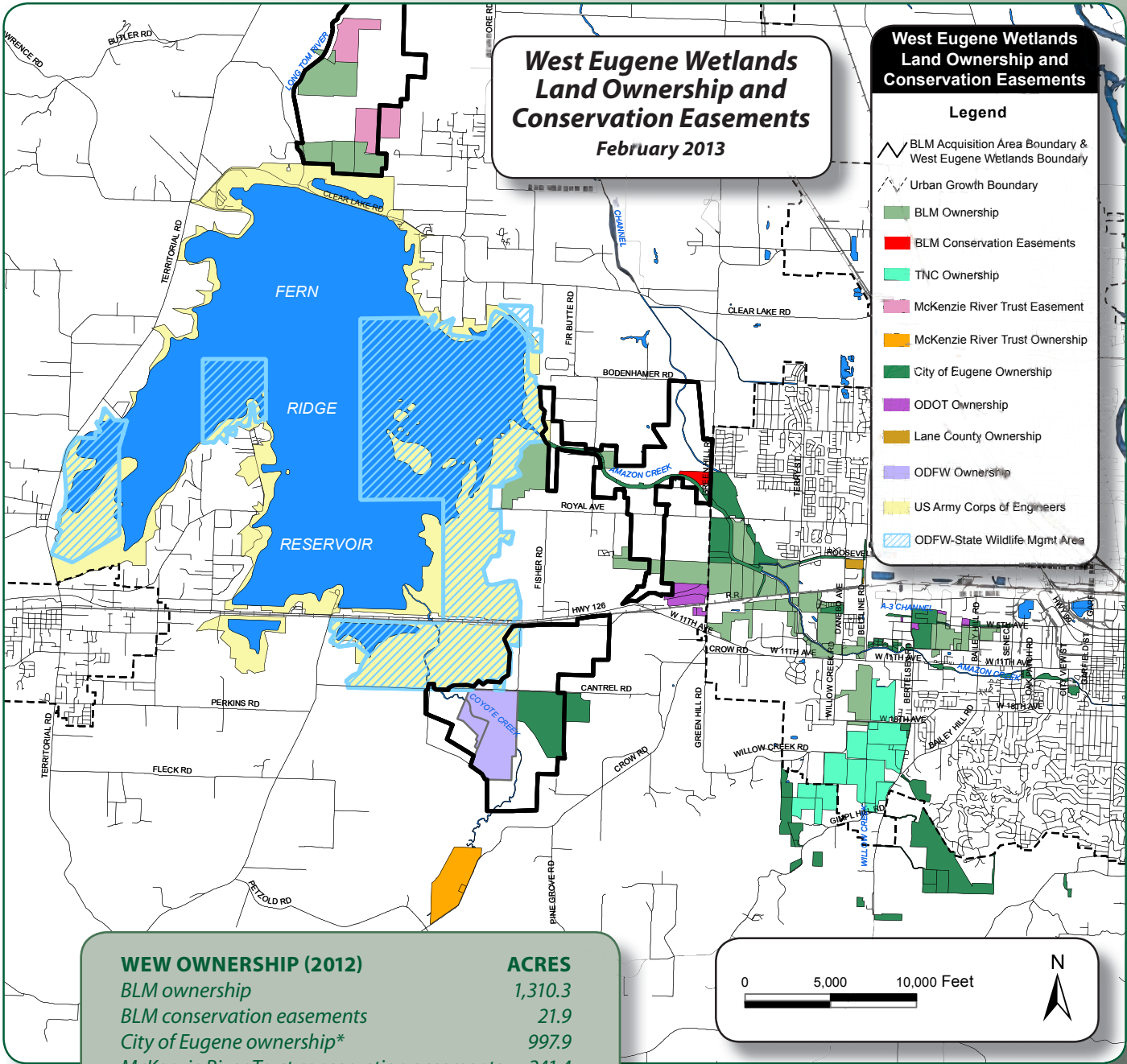


Photo credit: RaptorViews

*Coyote Creek Property*

### 2.3 SUMMARY OF OVERALL PARTNERSHIP ACREAGES IN THE WEW

R2R Partners currently own or hold conservation easements on a total of 3,670.7 acres in and around the WEW planning area. It should be noted that this tally does not include the approximately 2,500 acres of land around Fern Ridge Reservoir that is owned and managed by the U.S. Army Corps of Engineers and ODFW. When combined, these form a permanently protected block of habitat of nearly 6,170 acres.



**West Eugene Wetlands Land Ownership and Conservation Easements**  
February 2013

WEW OWNERSHIP (2012)	ACRES
BLM ownership	1,310.3
BLM conservation easements	21.9
City of Eugene ownership*	997.9
McKenzie River Trust conservation easements	241.4
McKenzie River Trust ownership	161.0
The Nature Conservancy ownership	820.3
ODOT ownership (wetland sites only)*	105.0
Lane County	12.9
<b>Total:</b>	<b>3,670.7</b>

\* Acreage reflects Salawa Meadow land transfer (ODOT to Eugene)



Photo credit: Carrie Karl



*WREN Family Exploration Day*

## 2.4 ENVIRONMENTAL EDUCATION

### 2.4.1 Willamette Resources & Education Network Education Program (WREN)

The West Eugene Wetlands Environmental Education Program was initiated in 1999 as the result of collaboration among various West Eugene Wetland Partners and organizations interested in environmental education. With the help of tremendous volunteers, project partners, members, and donors, WREN has offered environmental education programs rooted in the heart of the remaining Willamette Valley prairie habitat. WREN continued its mission of education and stewardship in 2012, and during that one year period has:

- Served 1,351 students, 233 volunteers and 2,330 community members!
- Increased outreach to diverse communities with even more field trips and classroom visits for students in low-income and rural schools, including Bethel, Eugene 4J, Springfield, Junction City, Fern Ridge and Florence districts, as well as home-schooled students and Girl Scout troops.
- Developed new educational curricula (e.g. ethnobotany and bioswales) that meet Oregon State Benchmarks and address topics of interest to local teachers and school districts.
- Hosted family exploration activities and wetlands bird seminars to reach even more members of the community.

Since 2002, when the education program began in earnest, WREN has served more than 44,000 people through school and interpretive programs for children and adults in our outdoor classroom.

### 2.4.2 Rachel Carson Center for Natural Resources

The Churchill High School Rachel Carson Center for Natural Resources continued to take advantage of its proximity to the West Eugene Wetlands to study native habitats and local natural resource planning efforts. In 2012, staff from Lane Council of Governments and the Institute for Applied Ecology provided instruction and training to approximately 30 juniors and seniors from the Rachel Carson Center related to ecology and research techniques. This instruction was done in conjunction with an EPA funded research project (see section 2.7.1). Topics studied included the historic landscape of the Willamette Valley, ecology of wetland prairie communities, habitat restoration techniques, and design of replicated field experiments. Students visited the Coyote Prairie experimental test plots and conducted their own seed bank study by growing out soil samples in the school's greenhouses that were collected from Coyote Prairie.

Photo credit: Rachel Carson Center for Natural Resources



*Rachel Carson Center for Natural  
Resource seed bank study*



Photo credit: Diane Steeck

*Lynda Boyer of Heritage Seedlings oversees grow-out of much of the seed used in WEW projects*

**Acreage of Seed Mixes by Year**

2008: 257 acres

2009: 320 acres

2010: 259 acres

2011: 215 acres

2012: 218 acres

**Total: 1,269 acres**

**2.5 PLANT MATERIALS PROCUREMENT PROGRAM**

The R2R Partnership’s native seed and plant procurement program is now well established and ensures the availability of native plant materials for restoration efforts within the wetlands and associated upland habitats on lands managed by the three contributing partners, the City, BLM, and TNC. The program has made great strides over the past few years in that several slow-growing species, such as common camas, blue-eyed grass, and narrow-leaf mule’s ears have reached reproductive size in the nursery and are producing larger amounts of seed for use in restoration. In 2012, there were about 75 native plant species being produced by Willamette Valley growers for use in the wetlands. The WEW restoration program also continues to rely on hand collection from wild sites for a few wetland species that are common locally and to genetically refresh species cultivated by contract growers. Seasonal botanists hand collected seed of 37 native species in 2012 for use in WEW projects. Together, nearly 1,200 pounds of locally native seed was produced and procured for the plant materials program in 2012. The program successfully provided seed for 218 acres of restoration projects in the WEW area in 55 customized seed mixes. The mixes included species that grow in emergent, vernal pool, wet prairie, and upland prairie habitats.



*Clarkia seed production bed at Heritage Seedlings*



Photo credit: Diane Steeck

## 2.6 RESEARCH AND MONITORING ACTIVITIES

### 2.6.1 EPA Wetland Program Development Grants

Lane Council of Governments (LCOG) is currently managing two EPA funded Wetland Program Development grants related to wetland prairie restoration working closely with the City of Eugene and the Institute for Applied Ecology. The focus of these two grants is summarized below:



Photo credit: RaptorViews

### *Coyote Prairie Test Plots*

#### **Restoring Diverse, Invasion-Resistant, Wetland Prairies**

In 2009, LCOG received a Wetland Program Development Grant through the EPA in partnership with the Institute for Applied Ecology (IAE) and City of Eugene to conduct research to help improve long-term success of wet prairie restoration projects in the Willamette Valley. The first phase of the proposed work is now complete and included hosting an Experts Workshop to help formulate research questions and designing a robust experiment to evaluate the effectiveness of management methods for maximum native diversity and weed suppression. Based on this input, replicated field experiments have been designed and implemented on 50 established test plots at Coyote Prairie. In 2010, management treatments were applied to the test plots between May and October and included ten replicates each of mowing, haying, burning, and grazing, with ten test plots being left untreated to serve as control. Prior to implementation of the management treatments, IAE field staff collected vegetation data from all fifty plots to document baseline conditions.

Following implementation of the management techniques, each test plot was over-seeded with a mix of native grasses and forbs. Three different seed mixes, with varying diversity, were applied in strips to the plots. In addition, weed seed was intentionally added to a small portion of each test plot to help assess resistance to weed invasion and weed establishment was monitored in spring 2011 and 2012. Final vegetation monitoring of the test plots will occur in May 2013 and final results will be ready in December 2013.

#### **Practical Guidelines for Wetland Prairie Restoration - Field-Tested Methods and Techniques**

In 2010, LCOG, in partnership with IAE, the City, and the University of Oregon Environmental Leadership Program (ELP) received a Wetland Program Development grant from the EPA. The grant is allowing the partners to analyze, refine, and disseminate cutting-edge information related to wetland prairie restoration. This will include conclusions drawn from previous research and evaluation of data from WEW mitigation bank projects and other wetland prairie restoration efforts. In addition, the team designed two additional small-scale research projects to help fill remaining knowledge gaps. This included a study on seed predation and a study to assess the relationship between topography and species diversity. Both of these small-scale field studies were completed in 2012. An eight person ELP student team received training in designing and conducting replicated field experiments and took the lead on implementing and



Photo credit: Jeff Krueger

*UO Environmental Leadership  
Students conduct field studies on  
micro-topography*

Photo credit: Carrie Karl

evaluating results of the topographic study. The students published their final report in the UO Oregon Undergraduate Research (OUR) Journal at <http://journals.oregondigital.org/OURJ/article/view/2391>, which is a peer-reviewed journal managed by undergraduate students.

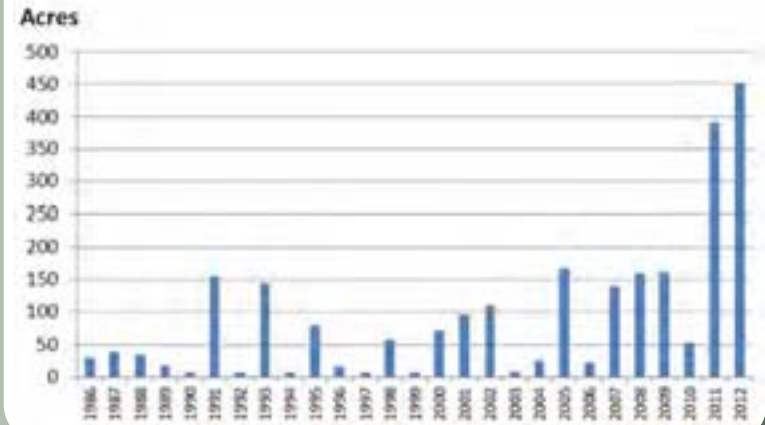
Ultimately, the results from these field studies will be compiled into a user friendly wetland prairie restoration guide and disseminated to a national audience through a web based platform to be developed by another team of ELP students in 2014. In addition, the grant will enable the partners to host two full-day mobile workshops on wetland prairie restoration for up to 100 participants in May 2014 and support presentations at several conferences.

## 2.7 ECOLOGICAL BURNS

The R2R Partners have long relied on controlled ecological burning as a restoration tool to protect and enhance biological diversity in prairie and savanna ecosystems, and in some cases, to reduce fuel loads at the wildland-urban interface. Since the first ecological burn was implemented at Willow Creek Natural Area in 1986, a total of 2,229 acres have been burned by R2R partners, much of that area within the West Eugene Wetlands.

Coming off a very successful year in 2011, weather and available resources again converged in 2012 to allow a new record high number of acres to be successfully burned. During September and October of 2012, a total of fourteen separate ecological burns were successfully completed covering a total of 450 acres. These occurred on lands owned by the BLM, The Nature Conservancy, the City of Eugene, the U.S. Army Corps of Engineers, and Lane County (Buford Recreation Area).

**R2R PARTNER ECOLOGICAL BURN HISTORY**



## 2.8 RESTORATION AND ENHANCEMENT HIGHLIGHTS



### **2.8.1 Fender's Habitat Restoration at Willow Creek Preserve**

Two areas adjacent to remnant Kincaid's lupine and Fender's blue butterfly populations are undergoing restoration at Willow Creek Preserve. One area in particular is starting to yield some promising results. In 2012, one year after beginning the restoration, the number of Fender's blue butterfly eggs counted was 28. In 2011, the number of eggs had risen to 2,934. In 2012, the number of eggs had doubled to approximately 6,000. This trajectory tends to confirm that the habitat enhancement including controlled ecological burns and planting thousands of native bulbs and seeds is working to restore these rare species. This restoration effort was initially funded under a Challenge Cost Share Agreement with the BLM, and coordinated by Dr. Cheryl Schultz, Assistant Professor of Biology at Washington State University in Vancouver, who worked closely with TNC on the restoration efforts and subsequent monitoring.

### **2.8.2 Threatened and Endangered Plant Augmentation Project**

Working closely with the BLM staff, the Institute for Applied Ecology planted over 2,000 Kincaid's Lupine and the Willamette Daisy plants in the spring of 2012 on three different BLM owned sites. These plants will assist in increasing plant and insect population on those sites as well as improving habitat connectivity and persistence of those species through time. A number of youth volunteers assisted with planting these native plugs and learned about the species first hand.



photo credit: Institute for Applied Ecology

*Golden Paintbrush*

### **2.8.3 Reintroduction of Golden Paintbrush**

Golden paintbrush (*Castilleja levisecta*) is a perennial forb that is endemic to the Pacific Northwest in western British Columbia, Washington, and Oregon. The species is currently considered extirpated from Oregon and is listed by the U.S. Fish and Wildlife Service as endangered across its range. The Institute for Applied Ecology in Corvallis is currently conducting large-scale reintroductions of golden paintbrush at a variety of locations in western Oregon to complement ongoing efforts in Washington and British Columbia with the ultimate objective of re-establishing viable populations in a portion of the species range. As part of this project, seed production was conducted at the Natural Resource Conservation Service, Corvallis Plant Materials Center, where seeds from four source populations were planted together into a single seed production bed. In 2011, a Corps of Engineers managed prairie site near Fern Ridge Reservoir was seeded to study reintroduction potential in the WEW area and numerous golden paintbrush seedlings were observed in spring 2012. Subsequent monitoring that summer tallied approximately 2,400 plants. None of these plants flowered in 2012, so follow-up monitoring will be conducted in spring 2013, and IAE will also be working to identify additional re-introduction sites in the WEW area in 2013.



Photo credit: Sally Villegas-Moore

*Kincaid's Lupine at Fir Butte*

#### **2.8.4 Fir Butte Habitat Enhancement Project**

In 2012, the USFWS, Institute for Applied Ecology, and BLM worked closely on the development of an enhancement plan for Fir Butte. This site is occupied with the two federally listed species, Kincaid's lupine and Fender's Blue Butterfly. This site is critical in providing connectivity to populations within the WEW project area, connecting the south population on The Nature Conservancy preserve to the northern populations on Corps of Engineers parcels. 2012 activities included manually controlling invasive species, removing solarization plastic, and planting 4 acres with native seed including several nectar producing forbs.

#### **2.8.5 Oak Hill Enhancement Project**

BLM treated approximately 50 acres of Oak Hill to control and remove invasive hardwood vegetation encroaching on the oak woodland and savanna habitat. Species removed during the thinning operation in 2012 included big-leaf maple, cascara buckthorn, wild cherry, and non-native hazelnut. The dense cover threatened the long-term viability of the oaks and madrone as well as the native grasses and forbs that exist in the understory. Overstory reduction brought the site closer to the target of 50-80% cover for oak woodland and 40-60% for oak savanna. The canopy cover was approximately 90 - 100% prior to treatment.

