**Mitigation Monitoring Report Cover Sheet**
**Oregon Department of State Lands**

**Block 1: Report Information**

DSL Permit Number: 26208 COE Permit Number: Nationwide Permit -#2001-1031
Permittee: Ken Reynolds
County: Benton Report Date: November 06, 2013 Monitoring Year 10
Date Removal-Fill Activity Completed:
Date mitigation was completed Grading: 2002 Planting: 2004
Report submitted by: Oregon Wetlands LLC

**Block 2: Monitoring Report Purpose**

This monitoring report is for monitoring a project that includes: (check all that apply):

X Compensatory **freshwater** wetland mitigation for permanent wetland impacts.
NA Compensatory **estuarine** wetland mitigation for permanent wetland impacts.
**Only non-wetland** compensatory mitigation.
**Only mitigation for temporary** impacts that has a monitoring requirement.
Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) not funded with money from our wetland mitigation revolving fund.
Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) funded with money from **our wetland mitigation revolving fund.**
X **Mitigation Bank** Report
Other: _____

**Block 3: Results**

| | Success Criteria | Met? (Y/N) | Comments/Reasons for Failure* |
|---|---|---|---|
| 1. | Hydrology | Yes | |
| 2. | Community Types | Yes | |
| 3. | Structural Diversity | Yes | |
| 4. | Species Diversity | Yes | |
| 5. | Tree and Shrubs | Yes | |
| 6. | Ground Cover | Yes | |
| 7. | Non-Native Species | Yes | |
| 8. | Wildlife Habitat | Yes | |

| | | |
|---|---|---|
| Remedial work recommended | Yes | No X |
| Deed Restriction or other protection instrument attached (noted: if a filed deed restriction was a required as a permit condition, please attach a copy: previously submitted | Yes X | No |
| Final Monitoring Report? | Yes | No X |
| Requesting release or partial release of bond/credits | Yes X | No |

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# LIST OF ATTACHMENTS

## 1.0 REGULATORY BACKGROUND

The purpose of this report is to summarize the progress of the Frazier Creek Wetland Mitigation Bank (Bank). The Frazier Creek Wetland Mitigation Bank, owned by Ken Reynolds, is located in Corvallis, Oregon. The site is located in Township 11 South, Range 4 West, northwest quarter of Section 18, Tax Lot 400, Benton County, Oregon. The Bank is contiguous with the Jackson-Frazier Wetland. The letter of approval for the Bank was signed in 2002 and is permitted as ACOE permit #2001-1031.

The Bank is 26.01 acres, all of which was deemed cropped wetlands that generated credits at a 2:1 ratio. The Bank has a potential of 13.005 credits. Of these 13 credits, the first 75% of the credits (9.88) have been released.

## 2.0 WORK SUMMARY

*Oregon Wetlands LLC teamed up with Ken Reynolds in March 2012 to assist with the management of the bank and put it on a trajectory for long term success and sustainability. The majority of the work was geared towards control of non-native species, coupled with some planting in underperforming areas.*

*Spot spraying began in early march, targeting the ash forest and willow areas. Once initial spraying was completed additional willow cuttings were installed in the willow area. These areas were repeatedly spot sprayed throughout the growing season to eliminate non-natives, and prevent seed set. The majority of the wet prairie received a broadleaf specific herbicide treatment in late spring to preserve the native graminoids, while eliminating non-native weeds. Following application, the prairie was spot sprayed several time to eliminate the small amounts of reed canarygrass, velvet grass and other non-native grasses encountered. The borders and scrub-shrub plantings were also spot treated throughout the growing season to eliminate non-natives. Once the emergent areas dried up, they were patched sprayed with a broadleaf specific herbicide, to eliminate the remaining pennyroyal. In addition, areas outside of the bank were treated with a broad spectrum herbicide in early fall, targeting reed canarygrass, and re-planted in conjunction with other seeding tasks*

*In order to aid with early detection of undesirable species in 2013, the entire open portion of the site was mowed in August, with the exception of ~ 5ac. targeted for forbs planting. The forbs area was selected based on proximity to other habitats, the observed hydrology, and to be beneficial to the greatest diversity of species. The forbs area was burned in late September once we finally got an official burn day. With the abundance of standing organics, the plot burned hot and fast, lasting less than 10 minutes from start to finish. Once it began to green back up, undesirable species were spot sprayed, and it was no-till planted to a diversity of native forbs in late October. The ash and willow area were sprayed one last time in early November, and both areas were planted to a native, mostly grass seed mix.*

*Per approval from both regulatory agencies, the upland portion of the small berm associated with the main channel was removed. This area was disconnected from surrounding hydrology and became a haven for non-natives species which threatened to spread throughout the site. The small amount of material (~30 yds$^3$) was removed and worked into the upland field east of the railroad tracks. Once the berm greened up in late October, it was sprayed out and seeded in conjunction with other seeding activities. (Previous Report)*

Following excellent survival of willow cuttings in 2012, additional cuttings were planted in early 2013 to expedite canopy closure in the willow area, and were evident on the site visit as well as in the monitoring data. The focus of 2013 work was to eliminate the few remaining non-native species, foster the increased diversity, and monitor the site for any unforeseen issues.

The fall 2012 planted forbs area provided the main source of maintenance work. It was treated with a grass specific herbicide in early spring to allow the forbs, sedges, and rushes to fully develop without completion from native grasses. This area was then walked several times throughout the growing season to spot treat any non-native

species. The forbs, sedges and rushes established well as evident on the site visit and in the monitoring data. The final walk through on 11/1/13 indicated excellent establishment of all perennial species, with extensive germination of annuals in-between.

The remainder of the site was walked several times to spot treat mainly non-native grasses. Several areas were flagged and patch treated with a broadleaf specific herbicide where spot spraying was not practical or advantageous. Two sections of the wet prairie were mowed in early fall, with ~half of the site remaining unmowed.

## 3.0 AS-BUILT PLANS

As-built monitoring was conducted March 29, 2004.

## 4.0 MONITORING METHODOLOGY AND GENERAL RESULTS

Vegetation monitoring was conducted on June 07, 2013 by Ray Fiori. Complete monitoring results are included as Attachment 1 and the Monitoring Point Location Map is included as Attachment 2, updated with the 2009 imagery. Eight-nine monitoring plots were examined. The monitoring was conducted according to approved Bank protocols, with only minor differences as have been noted previously. Based on comments received from the regulatory agencies following the 2012 site visit, additional monitoring was completed in 2013 to address several provisions within the extensive list of performance measures that had gone previously unnoticed/monitored.

Under the structural diversity component, section b) states multi-layered canopies must be present in hedgerow and northern perimeter of wetland forest (also referred to as transitional shrub). This measure has been previously monitored in the hedgerows, but neglected in northern perimeter of wetland forest. Data was collected in 2013 to document species composition as well as average height for tree species, average width for shrub species, and aerial coverage.

Under the survivorship of trees and shrubs, section a) survivorship of trees and shrubs should result in planting densities within 5% recommended in the planting plan. The planting plan for hedgerow planting recommended 985 plants so the survivorship target is 936-985 plants. Aerial coverage is utilized in the monitoring due to extensive growth.
The planting plan for the forested wetland called for planting of 1,050 Ash and no shrubs for a survivorship target of 1,000-1,050 Ash trees, or 293 stems/ac.
The planting plan for the transitional shrub area (also referred to as Northern edge of wetland forest) called for 350 plants for a survivorship target of 333-350 plants. This habitat is very mature and also has a diversity component, so species composition, average height of trees, average width of shrubs, and estimate of aerial coverage was utilized in monitoring.
The planting plan for the willow area called for planting 275 willows, so the survivorship target is 260-275 plants. Since this area is small, and total plant counts were used in the past, that protocol is still being followed.

Under the survivorship of ground cover, section c) There should be 50% ground cover within 2 years in the shrub and forest habitat. At this point the hedgerow and transitional shrub areas are closed canopy systems, with organic leaf litter being the dominant ground cover. The ash forest has 20 monitoring points to document ground cover. Two plots were established in the willow area this year to quantify ground cover. From the center of the area, 2 pin flags were thrown, one in each direction to establish random plots. They are illustrated on the monitoring map, and data was collected. The herbaceous layer will slowly fade away over time as the canopies close in on these habitats.

### *4.1 Northern Boundary Hedgerow*

*As noted in the 2008 monitoring report, the protocol for monitoring the hedgerow planting was modified in 2008 due to the density of the vegetation and has been followed since. The protocol is as follows: the species of shrubs and trees, approximate size, row width and estimate of aerial cover are noted within a 10'length of hedgerow starting at the plot marker and extending 10' to the west within the hedgerow. (Previous Report)*

The hedge row tree and shrub layer accounted for approximately 95.5% of the cover. The hedgerow shrub/tree vegetation averaged 15.5 feet in width. The average high shrub/tree height was about 25.1 feet and average shrub height was 8.5 feet. The hedge row continues to thrive and function as planned.

97.88% of the herbaceous and grass species within the hedge row are native. Trace amounts of Curly dock, and pennyroyal are the non-natives that are present. This is now a closed canopy system, so herbaceous species are only present on the borders where there is some light penetration.

### *4.2 Willow Planting Southwest Portion of Bank*

*Additional willow cuttings were installed in early spring 2012, with good survival as evident on the annual site visit. Non-native vegetation has also been eliminated from the understory, providing space for additional native woody plants to thrive. During the time of monitoring, 141 native woody plants were present, dominated by willows with a few native recruits. As indicated in the instrument, the primary objectives of this area was to provide structural diversity and wildlife cover, both of which are being accomplished.*

*The herbaceous layer is dominated by leaf litter among the originally planted willows, as these plants are quite large and this should be expected as succession moves forward. After extensive non-native control this year, the more open areas are mostly bare with remnant populations of dense sedge (Carex densa), tufted hairgrass (Deschampsia cespitosa), and meadow barley (Hordeum brachyantherum), which were avoided during spot spraying. Although it shouldn't be expected to prosper in the future as the woody species expand, the understory was planted with a native prairie mix to occupy space while the overstory is establishing. Additional willow cuttings will be installed in late winter to expedite canopy closure. (Previous Report)*

To quantify the herbaceous layer in the willow area this year, 2 monitoring plots were established, with the same monitoring protocol as the herbaceous layer in the ash forest. The herbaceous layer is dominated by native species which represent 90% cover. The total plant count for this area was 313 live plants, which provided 50% aerial coverage.

### *4.3 Ash Forest and Shrub Edge*

*Approximately 3.5 acres of ash forest with a shrub edge were planted in 2004. Sampling protocols have changed over the years with varying sample sizes, plot locations and reporting of results. The sampling protocols developed and implemented in 2009 continue to be followed. Twenty plots are monitored using a 20' diameter for the overstory layer and a 3' by 3' plot for the herbaceous layer, the center of each plot being the stake. (Previous Report)*

In 2013, there were 14.25 trees per plot, which represents 360.7 tress/acre. There are abundant native Ash seedlings, and with survivorship standards already met, the woody component is not of concern.

The herbaceous layer is 66.5% native vegetation cover, with only 8.75% non-native cover, and no non-native invasives. Extensive work has went into eliminating non-native species the last 2 years which will lead to increased native cover and decreased bare ground in the short term. As the trees continue to grow and the canopy begins to close, herbaceous cover will ultimately decrease in the long-term

### *4.4 Wet Prairie*

*Grass cover versus forb cover in the wet prairie remains high at 88.4% grass, but this was reduced from 93.4% grass cover in 2011. Meadow barley remains the most dominant species at 46.63%. The next most abundant species are tufted hairgrass at 22.22%, spike bentgrass at 13.91 % and slough grass at 3.58%. Pennyroyal, the most abundant non-native in 2011 was reduced from 1.63% cover to 0.33%. In order to increase diversity, a portion of the prairie was burned, and planted to a diversity of native forbs. (Previous Report)*

Forty-six plots were monitored located along east-to-west transects that were about 200 feet apart. There were approximately 3.3 sample plots per acre in the wet prairie.

Total native cover is 93.20%, with no non-native invasives. This year grass cover versus forbs cover in the wet prairie was 67.22% grass and 28.78% forbs. Meadow barley remains the most dominant grass species at 28.67%, while Denseflower willowherb is the most dominant forbs species at 9.56%. The next most abundant species are tufted hairgrass at 17.22% and Popcornflower at 5.11%.

### *4.5 Swale and Emergent*

*The swale and emergent community remain diverse with 19 native fac or wetter species. The biggest changes from 2011 are a slight shift in species dominance, coupled with a significant reduction in pennyroyal. Creeping spike rush and pointed rush were the most dominant species in 2012, while pennyroyal was reduced to 5.5% cover. Pennyroyal was subsequently eliminated from these habitats by then end of the growing season, but conditions were not advantageous for effective control until after the monitoring period. (Previous Report)*

The swale and emergent community remain diverse with 22 native fac or wetter species. Native cover is 94.5%, with only 2% non-native species, and no non-native invasives.

### *4.6 Transitional Shrub*

*The transitional shrub zone on the north and east side of the ash forest continues to do remarkable. It has excellent coverage and variety of shrub and trees species. The shrub coverage averages 7-10 feet in height and the tree height averages 12-25 feet in a row 22 feet wide. The species noted includes Douglas hawthorn (Crataegus douglasii), Oregon ash (Fraxinus latifolia), Pacific crabapple (Pyrus fusca), cottonwood (Populus balsamifera), cascara (Rhamnus purshiana), red-osier dogwood (Cornus stolonifera) Douglas spirea (Spiraea douglasii), Nootka rose (Rosa nutkana), clustered rose (Rosa pisocarpa), and willow (Salix ssp). One Himalayan blackberry was encountered, which was removed. There is little herbaceous layer due to the full coverage by the shrub and trees. Species noted includes: Slough sedge, Dense sedge, curly dock, Fringe cup, and tufted hairgrass. (Previous Report)*

This area was formally monitored this year to quantify habitat conditions, and species diversity. There is four species of native trees and four species of native shrubs present providing multilayered canopies, excellent diversity, and 95% aerial coverage.

## 5.0 PERFORMANCE STANDARDS AND MONITORING RESULTS

### *5.1 Hydrology*

Performance Standards

a) Surface water should be visible in the distribution channel
b) Wetland hydrology as defined in the 1987 COE Manual must be present
c) The standard will be satisfied when the objective has been satisfied in two years with normal or below precipitation beginning in 2003

Results – *Criteria Satisfied*

Hydrology monitoring performance standards were previously met, following two years of monitoring during years of normal or below normal precipitation. As such, no additional hydrology monitoring was completed.

### *5.2 Community Types*

Performance Standards

Six community types should be present in the approximate locations identified on the planting plan. The area of each community type should be within five percent of the proposed area.

Results - *Criteria Satisfied*

Six community types (hedgerow scrub/shrub, forest, wet prairie, flooded emergent, transitional shrub edge, and shrub willow) are present. They are located in the approximate location designated on the planting plan.

### *5.3 Structural Diversity*

Performance Standards

a. Grass, shrub, and forest habitats must be present
b. Multilayered canopies must be present in the hedgerows and northern perimeter of wetland forest.

Results - *Criteria Satisfied*

a. Each of the three specified habitats is present.
b. The hedgerow and the northern perimeter of the wetland forest have a mixed canopy of both low and high growing shrubs and trees.

### *5.4 Species Diversity*

Performance Standards

a. Three native species of trees maturing at >20 feet must be present
b. Minimum of four species of shrubs in hedgerows and transitional shrub zone

c. Twelve native species of groundcover in emergent zone including three species of Carex, two species of Juncus, *Deschampsia cespitosa*, *Hordeum brachyantherum*, and four species of forbs.

Results - *Criteria Satisfied*

a. Five species of native trees were identified during the monitoring, including Oregon ash, Douglas hawthorn, cascara, cottonwood, and western crabapple.
b. Five native shrubs, Nootka rose, cluster rose, Douglas spirea, red-osier dogwood and willow are present within the hedgerows and transitional shrub zone.
c. Within the emergent zone, four species of Carex, three species of Juncus, *Deschampsia cespitosa*, *Hordeum brachyantherum*, and nine native fac or wetter species of forbs are present. Overall, 23 native species were identified in the groundcover within the emergent wetland. In addition there is one more native rush of a different genus.

## *5.5* ***Tree and Shrubs***

Performance Standards

a. Planting density within five percent of planting plan—typically 80 to 100% survivorship
b. Increase aerial cover in successive years; 15% aerial cover of trees 3 years after planting; 40 to 60% aerial cover of shrubs after three years.

Results – *Criteria satisfied*

a. Tree and shrub survivorship along with natural propagation within the hedgerows, willow area, transitional shrub, and ash forest surpass the 100% survivorship standard.
b. The aerial extent of the trees and shrubs has met the 15% coverage by trees and 40-60% by shrubs in all community types.

## *5.6* ***Ground Cover***

Performance Standards

a. 30 to 50% native ground cover in emergent and wet prairie zones after one year
b. 60 to 80% ground cover of native Willamette Valley species two years after installation in emergent and wet prairie zones
c. 50% native ground cover within two years in shrub and forest habitat

Results - *Criteria satisfied*

a & b. Within the emergent/swale community, % of the cover is native vegetation and within the wet prairie zone, there is 94.9% native vegetation cover 93.2%.
c. The hedge row has 95.5% native aerial cover, with 97.77% of the limited herbaceous layer native species. The 0.2 acre shrub/willow wetland is approximately 50% native aerial cover, and 90% of the herbaceous cover is native. The transitional shrub area is 95% native aerial cover, with no herbaceous layer due to canopy closure The Ash forest has 66.5% native herbaceous cover.

## *5.7* ***Non-Native Species***

Performance Standards

a. Ryegrass should be plowed under and removed prior to active installation of native plants. Not to exceed 10% of ground cover.
b. Zero tolerance for reed canary grass, Himalayan blackberry, Evergreen blackberry (*Rubus ursinus*), purple loosestrife (*Lythrum salicaria*), kudzu (Pueraria ssp.), Japanese knotweed (*Polygonum cuspidatum*), and poison hemlock (*Conlon maculatum)*, the first two years after installation.
c. Aerial cover of species listed in b. should be no more than five percent two years after plant installation and <15% thereafter.

Results - Criteria satisfied.

a. No Ryegrass present
b. & c. The only two zero tolerance species noted at all within the Bank are trace amounts of Himalayan blackberry and reed canary grass, both of which were treated in early fall when control is most effective.

### *5.8 Wildlife Habitat*

Performance Standards

a. Emergent, prairie, shrub, and forest habitat types must be present.
b. There should be sightings or signs of songbirds, waterfowl, shorebirds, amphibians, and mammals each year. The number of sightings should increase annually as habitats mature.

Results - Criteria satisfied.

a. All of the habitat types are present.
b. Sightings of songbirds, waterfowl, shorebirds, amphibians, and mammals were recorded. A River otter was even encountered at the low water crossing on 10/09/13.

## 6.0 PHOTO POINT MONITORING

Photos from the photo points are included as Attachment 3. Photos were taken on June 07, 2013, and the location and photo direction is listed on each photo.

## 7.0 SUGGESTED REMEDIAL

At this point native species are well established and thriving in all habitats. Spot spraying will be utilized to eliminate any non-natives that are indentified. Grass specific herbicide will like be utilized again in the forbs area to decrease native grass competition and allow the native forbs to fully establish in spring 2014.

## 8.0 CREDIT SALES SUMMARY

Four credit releases have occurred. The first release (30%) for 3.92 credits in April 2003 and a second (15%) release for 1.96 credits in August 2004, third release (15.6%) for 2 credits in March 2013, and (15.6%) for 2 credits in April 2013 for a total credit release of 9.88 credits (76%). Of these 9.88 credits, 6.77 have been sold. To date 3.11 credits remained unsold and documented in table 1.

**Table 1: Credit Sales Summary:**

| *DATE* | *NAME* | *DSL* | *CORP* | *ADDED* | *SOLD* | *BALANCE* |
|---|---|---|---|---|---|---|
| 04/02/2003 | CORPS/DSL INITIAL RELEASE | Permit Number | | 3.92 | | 3.92 |
| 04/22/2003 | Cascade View Developments LLC | 26456 | | | 0.03 | 3.89 |
| 07/08/2003 | City of Corvallis | 30408 | | | 0.42 | 3.47 |
| 07/24/2003 | Norway Development | 5418 | | | 0.1 | 3.37 |
| 01/16/2004 | Timberhill Corp | 24132-RF | | | 0.26 | 3.11 |
| 05/26/2004 | DSL Revolving Fund | | | | 0.17 | 2.94 |
| 06/02/2004 | Timberhill Corp | 30514-FP | 2000-0320 | | 1.28 | 1.66 |
| 08/12/2004 | CREDIT RELEASE 2 | | | 1.96 | | 3.62 |
| 08/27/2004 | Jim Shaver | 32347-GA | 2004-0326 | | 0.06 | 3.56 |
| 07/13/2004 | Rodger Nyquist | | 2003-0053 | | 0.03 | 3.53 |
| 09/06/2004 | Ronald Neilson | | | | 0.02 | 3.51 |
| 09/20/2004 | Clearwater II LLC | 32861-FP | | | 0.19 | 3.32 |
| 11/18/2004 | Thomas Fox Properties | 32863-FP | | | 0.77 | 2.55 |
| 11/30/2004 | Sammi Molvi | 32811-FP | | | 0.28 | 2.27 |
| 12/17/2004 | Development by Design | 33260-FP | | | 0.14 | 2.13 |
| 04/11/2005 | Bill Boyd | 33384 | | | 1.14 | 0.99 |
| 06/29/2005 | J. Conser & Sons | 33868-RF | | | 0.43 | 0.56 |
| 08/26/2005 | Tuscany Estates | 34542-RF | | | 0.47 | 0.09 |
| 03/24/2006 | ODOT Philomath Couplet | 34148-GA | | | 0.06 | 0.03 |
| 05/17/2012 | CREDIT RELEASE 3 | | | 2.00 | | 2.03 |
| 04/16/2013 | CREDIT RELEASE 4 | | | 2.00 | | 4.03 |
| 05/20/2013 | Conser Design | FP-15070 | | | 0.91 | 3.12 |
| 11/08/2013 | Corvallis Memory Facility | 54649 | NWP 2013-237 | | 0.01 | 3.11 |
| | | | | | | |

## 9.0 CREDIT RELEASE REQUEST

All portions of the Bank are meeting or exceeding performance standards and we request the remaining 3.125 credits be released per the instrument. Oregon Wetlands LLC has accomplished all tasks outlined in the Frazier Creek Management Plan memo dated 03/14/2012 as promised within the timelines specified. OW has went to great lengths to exceed the minimum performance requirements and introduce additional diversity of species and virtually eliminate non-native species to put the bank on a positive trajectory for long-term sustainability.

| | |
|---|---|
| Total credits available: | 13.005 |
| Credits released to date: | 9.880 |
| Credits Remaining: | 3.125 |
| **Requested Credit Release** | **3.125 (FINAL)** |

## 10.0 CONCLUSION

The Frazier Creek Wetland Mitigation Bank is performing well and on track to be a highly successful mitigation bank. Non-native species have been virtually eliminated, allowing native species to flourish. Additional diversity was added to the prairie in 2012 and far exceeds performance standards. The greatest deficiencies in the past have been low stem counts coupled with a weedy understory in the willow area, an understory dominated by non-native species in the designated ash forest, and increasing amounts of pennyroyal throughout the site, all of which have been rectified. As was evident during the annual site visit and documented in the monitoring results, the site has evolved quickly, back on a highly successful trajectory. Based on late fall observations, 2014 is shaping up to be even more impressive, far exceeding the performance standards with excellent diversity, few non-natives, and no invasives.

Attachment 1: Monitoring Data

| Frazier Creek Wetland Mitigatigation Bank | | | | | Transect 1 | | | | | | | | | | | | | Transect 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wet Prairie** | | | | | **NOTE: T1-10, T2-5, T2-6, T3-9, T4-9 have been moved to the swale/emergent plot data results.** | | | | | | | | | | | | | | | | | |
| **June 7, 2013** | | | | | **T3-2, T3-6 and T5-1 were removed.** | | | | | | | | | | | | | | | | | |
| | | | | **Ave.** | | | | | | | | | | | | | | | | | | |
| | | | | **Cover** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **11** | **12** | **13** | | **1** | **2** | **3** | **4** | **7** |
| **Botanical Name** | **Common Name** | **Status** | **Origin** | **ea. Species** | | | | | | | | | | | | | | | | | | |
| **Forbs/Sedge/Rush Species - percent cover** | | | | | | | | | | | | | | | | | | | | | | |
| *Alisma triviale* | Northern water plantain | OBL | native | 0.00 | | | | | | | | | | | | | | | | | | |
| *Bidens frondosa* | Leafy beggars-tick | FACW | native | 0.11 | | | | | | | | | | | | | | 5 | | | | |
| *Carex densa* | Dense sedge | OBL | native | 1.78 | | | | | 10 | | 20 | 15 | 5 | | | | | | | | | |
| *Carex feta* | Green-sheath sedge | FACW | native | 0.47 | | | | | | | | | | 1 | | | | | | | | |
| *Carex stipata* | Saw-beaked sedge | FACW | native | 0.56 | | | | | | | | | | | | | | | | | | |
| *Carex unilaterils* | One-sided sedge | FACW | native | 3.22 | | | | | 10 | 10 | 5 | 5 | 5 | 5 | 5 | 20 | | | | | | 5 |
| *Centuarium umbellatum* | Common centuray | FAC | non | 0.00 | | | | | | | | | | | | | | | | | | |
| *Eleocharis palustris* | Creeping spike rush | OBL | native | 0.33 | | | | | | | | | | | | | | 15 | | | | |
| *Epilobium densiflorum* | Denseflower willow herb | NOL | native | 9.56 | | | | 55 | 20 | 35 | 45 | 50 | 30 | | | | | | | | | 40 |
| *Gnaphalium palustre* | Cudweed | FAC | native | 0.13 | | | | | | | | | | 1 | | | | | | | | |
| *Kickxia elatine* | Sharp-point fluellin | UPL | non | 0.58 | | | | | | | | | | 1 | 5 | | | | | 5 | | |
| *Lotus purshianus* | spanish clover | NOL | native | 0.11 | | | | | | | | | | | | | | | | | | |
| *Juncus acuminatus* | Tapered rush | OBL | native | 0.11 | | | | | | | | | | | 5 | | | | | | | |
| *Juncus tenuis* | Slender rush | FACW | native | 3.22 | | | | | 20 | 15 | 10 | 10 | 10 | | | | | | | | | 10 |
| *Mentha pulegium* | Pennyroyal | OBL | non | 0.22 | | | | | | | | | | | | | | 5 | | | | 5 |
| *Mimulus guttatus* | Yellow Money-flower | OBL | native | 1.11 | | | | 5 | 5 | 10 | 5 | 5 | 10 | | | | | | | | | |
| *Myosotis laxa* | small flowered forget me no | OBL | native | 0.00 | | | | | | | | | | | | | | | | | | |
| *Plagiobothrys figuratus* | Fragrant popcorn flower | FACW | native | 5.11 | | | | 30 | 25 | 25 | 10 | 10 | 30 | | | | | | | | | 15 |
| *Polygonum amphibium* | Smartweed | OBL | native | 0.13 | | | | | | | | | | 1 | | | | 5 | | | | |
| *Prunella vulgaris* | Common selfheal | FACU | native | 1.56 | | | | | 10 | 5 | 5 | 5 | 10 | | | | | | | | | 10 |
| *Sonchus asper* | Spiny sow thistle | FAC | non | 0.00 | | | | | | | | | | | | | | | | | | |
| *Sidalcea nelsoniana* | Nelson's checkermallow | FACW | native | 0.44 | | | | | | | | | | | | | | | | | | 5 |
| *Rorippa curvisiliqua* | Western yellowcress | OBL | native | 0.02 | | | | | | | | | | 1 | | | | | | | | |
| *Rumex conglomeratus* | Clustered dock | FACW | non | 0.00 | | | | | | | | | | | | | | | | | | |
| *Rumex crispus* | Curly Dock | FAC | non | 0.00 | | | | | | | | | | | | | | | | | | |
| | | | | 28.78 | | | | | | | | | | | | | | | | | | |
| **Grass Species - percent cover** | | | | | | | | | | | | | | | | | | | | | | |
| *Agrostis exarata* | Spike bentgrass | FACW | native | 15.33 | 5 | 10 | 20 | | | | | | | 30 | 25 | 10 | | | 20 | 30 | 40 | |
| *Beckmania syzigachne* | Slough grass | OBL | native | 3.89 | | | | | | | | | | 5 | 5 | 5 | | | | 10 | | |
| *Bromus carinatus* | California brome | NOL | native | 0.00 | | | | | | | | | | | | | | | | | | |
| *Bromus hordeaceus* | Soft chess | FACU | non | 0.22 | | | | | | | | | | | | | | | 10 | | | |
| *Deschampsia cespitosa* | Tufted hairgrass | FACW | native | 17.22 | 70 | 80 | 40 | | | | | | | 15 | 15 | 15 | | | 20 | 15 | 20 | |
| *Deschampsia danthonioides* | Annual hairgrass | FACW- | native | 0.11 | | | | | | | | | | | | | | | | | | |
| *Glyceria elata* | Tall manna grass | FACW | native | 0.00 | | | | | | | | | | | | | | | | | | |
| *Holcus lanatus* | Velvet grass | FAC | non | 0.33 | | | | | | | | | | | | | | | | | | |
| *Hordeum brachyantherm* | Meadow barley | FACW | native | 28.67 | 20 | 10 | 30 | 10 | | | | | | 30 | 40 | 45 | | 10 | 40 | 40 | 40 | 10 |
| *Poa trivialis* | Rough-stalk bluegrass | FACW | non | 0.44 | | | | | | | | | | | | | | | 10 | | | |
| *Vulpia myuros* | Rat-tail fescue | NOL | non | 1.00 | 5 | | | | | | | | | | | | | | | | | |
| | | | | 67.22 | | | | | | | | | | | | | | | | | | |
| Bareground due to Organic litter | | Mean= | 4.00 | | | | 10 | | | | | | | 10 | | 5 | | 60 | | | | |
| Total % vegetative cover | | Mean= | 96.00 | | 100 | 100 | 90 | 100 | 100 | 100 | 100 | 100 | 100 | 90 | 100 | 95 | | 40 | 100 | 100 | 100 | 100 |
| Relative % native canopy cover | | Mean= | 93.20 | | 95 | 100 | 90 | 100 | 100 | 100 | 100 | 100 | 100 | 89 | 95 | 95 | | 35 | 80 | 95 | 100 | 95 |
| Relative % listed species invasive canopy cover : | | Mean= | 0.00 | | | | | | | | | | | | | | | | | | | |
| Listed species includes reed canary grass, Himalayan Blackberry, evergreen blackberry, purple loosestrife, kudzu, Japanese knotweed and poison hemlock. | | | | | | | | | | | | | | | | | | | | | | |
| Total Sample points = 45 | | | | | | | | | | | | | | | | | | | | | | |

Attachment 1: Monitoring Data

| | | | | | | | Transect 3 | | | | | | | | | | | Transect 4 | | | | | | | | | | | | Transect 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **8** | **9** | **10** | **11** | **12** | **13** | | **1** | **3** | **4** | **5** | **7** | **8** | **10** | **11** | **12** | **13** | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **10e** | **10w** | **11** | | **1** | | |
| | | 10 | 5 | | | | 10 | | | | | | 5 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | 10 | 10 | | | | | | |
| | | | | | | | 15 | | | | | | | | | | | 5 | | | | | | 5 | | | | | | | | |
| | 15 | 10 | | | | | 10 | | | | 5 | 10 | 5 | | | | | | | | | | | 5 | 5 | 10 | | | | | | |
| 55 | 50 | 20 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | 5 | 5 | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 5 | 20 | 15 | | | | | | | | | 5 | 5 | 5 | | | | | 5 | | | 5 | | | | | | | | | | |
| 5 | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| 20 | 15 | 20 | 20 | | | | | | | | 5 | 5 | | | | | | | | | | | | | | | | | | | | |
| 5 | 10 | | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 35 | 15 | | 20 | 10 | 25 | 30 | 15 | 10 | 30 | 20 | 10 | 40 | | 15 | 25 | 30 | 15 | 30 | 15 | 35 | 15 | 10 | 15 | 15 | | 20 | | |
| | | | | | 15 | | | | | | 5 | | 15 | | | | | | | | | | 55 | 25 | 15 | 15 | | 5 | | | | |
| | | | | 20 | 60 | | 10 | 45 | 30 | 30 | | 5 | 10 | 35 | 5 | | | 30 | 30 | 10 | 30 | 25 | 5 | | 20 | 25 | 25 | 15 | | 20 | | |
| | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 15 | | | | | | | | | | | | | | | | | |
| | 5 | 5 | 5 | 35 | 10 | | 20 | 30 | 45 | 40 | 70 | 55 | 30 | 40 | 50 | 50 | | 35 | 35 | 60 | 45 | 35 | 15 | 30 | 35 | 30 | 60 | 55 | | 40 | | |
| | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | | | | 5 | | |
| | | 5 | | | | | | 15 | | | | | | | 10 | 5 | | | 5 | | | | | | | | | | | | | |
| | | | 10 | 10 | | | 15 | | | | | | | | 10 | | | 15 | | | | | 10 | | | | | 10 | | 15 | | |
| 100 | 100 | 100 | 90 | 90 | 100 | | 85 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 90 | 100 | | 85 | 100 | 100 | 100 | 100 | 90 | 100 | 100 | 100 | 100 | 90 | | 85 | | |
| 95 | 100 | 95 | 90 | 90 | 100 | | 85 | 85 | 100 | 100 | 100 | 100 | 100 | 100 | 65 | 90 | | 85 | 95 | 100 | 95 | 95 | 90 | 100 | 100 | 100 | 100 | 90 | | 80 | | |

Attachment 1: Monitoring Data

| Frazier Creek Wetland Mitigatigation Bank | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Swale/Emergent Plot Data | | | | | | | | | | | | | | |
| June 7, 2013 | | | | | | | | | | | | | | |
| | | | | Ave. | | | | | | | | | | |
| | | | | Cover | 1 | 2 | 3 | 4 | 5 | T1-10 | T2-5 | T2-6 | T3-9 | T4-9 |
| **Common Name** | **Botanical Name** | **Status** | **Origin** | **ea. Species** | | | | | | | | | | |
| **Overstory Species** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| *Fraxinus latifolia* | Oregon ash | FACW | native | | | | | | | | | | | |
| **Herbaceous Species - percent cover** | | | | | | | | | | | | | | |
| *Alisma gramineum* | Narrow leaf water plaintain | OBL | native | 2.5 | 10 | | 10 | | | | | | 5 | |
| *Bidens frondosa* | Leafy beggars-tick | FACW | native | 0.0 | | | | | | | | | | |
| *Carex densa* | Dense sedge | OBL | native | 4.0 | 5 | | | 10 | | 10 | 10 | | | 5 |
| *Carex feta* | Green-sheath sedge | FACW | native | 2.0 | 5 | | | | | | | | 5 | 10 |
| *Carex obnupta* | Slough sedge | OBL | native | 2.5 | | | | 20 | | | 5 | | | |
| *Carex unilaterils* | One-sided sedge | FACW | native | 5.0 | | 5 | | 5 | | | 15 | | 5 | 20 |
| *Centuarium umbellatum* | Common centuray | FAC | non | 0.0 | | | | | | | | | | |
| *Eleocharis palustris* | Creeping spike rush | OBL | native | 11.5 | 40 | 30 | 15 | 10 | 5 | | | | 15 | |
| *Epilobium densiflorum* | Denseflower willowherb | FACW | native | 2.5 | | | | | | | | 25 | | |
| *Epilobium watsonii* | Watson's willow herb | FACW | native | 0.0 | | | | | | | | | | |
| *Eriophyllum lanatum* | Oregon sunshine | NOL | native | 0.5 | | | | | | | | 5 | | |
| *Juncus acuminatus* | Tapered rush | OBL | native | 11.5 | 15 | 20 | 15 | | | 45 | | | 20 | |
| *Juncus effusus* | Soft rush | FACW | native | 1.0 | | | | 10 | | | | | | |
| *Juncus oxymeris* | Pointed rush | FACW | native | 7.5 | | 10 | 5 | 15 | 5 | 20 | | | 15 | 5 |
| *Lemna minor* | Common duckweed | OBL | native | 4.0 | | | 25 | | 15 | | | | | |
| *Mentha pulegium* | Pennyroyal | OBL | non | 0.0 | | | | | | | | | | |
| *Mimulus guttatus* | Yellow Money-flower | OBL | native | 1.5 | | | | 5 | | | | 10 | | |
| *Myosotis laxa* | small flowered forget me n | OBL | native | 4.0 | | 5 | 5 | 5 | 20 | 5 | | | | |
| *Oenanthe sarmentosa* | Pacific water parsley | OBL | native | 5.0 | | | | | 50 | | | | | |
| *Parentucellia viscosa* | Yellow parentucellia | FAC | non | 0.0 | | | | | | | | | | |
| *Plagiobothrys figuratus* | Fragrant popcorn flower | FACW | native | 3.5 | | | | | | | | 35 | | |
| *Prunella vulgaris* | Common selfheal | FACU | native | 0.5 | | | | | | | | 5 | | |
| *Rumex conglomeratus* | Clustered dock | FACW | non | 0.0 | | | | | | | | | | |
| *Rumex crispus* | Curly Dock | FAC | non | 0.0 | | | | | | | | | | |
| *Sidalcea nelsoniana* | Nelson's checkermallow | FACW | native | 0.5 | | | | | | | | 5 | | |
| *Typha latifolia* | Cat tail | OBL | native | 2.0 | | 20 | | | | | | | | |
| *Veronica scutella* | Skullcap speedwell | OBL | native | 0.0 | | | | | | | | | | |
| | | | | 71.5 | | | | | | | | | | |
| **Grass Species - percent cover** | | | | | | | | | | | | | | |
| *Agrostis exarata* | Spike bentgrass | FACW | native | 2.5 | | | | | | 5 | 10 | | | 10 |
| *Beckmania syzigachne* | Slough grass | OBL | native | 7.0 | | 10 | 15 | 15 | 5 | 10 | | | 10 | 5 |
| *Deschampsia cespitosa* | Tufted hairgrass | FACW | native | 3.5 | | | | | | 5 | 15 | 5 | | 10 |
| *Glyceria elata* | Tall manna grass | FACW | native | 2.5 | 15 | | | | | | | | 10 | |
| *Hordeum brachyantherm* | Meadow barley | FACW | native | 7.5 | | | | | | | 35 | 5 | | 35 |
| *Poa trivialis* | Rough-stalk bluegrass | FACW | non | 1.0 | | | | 5 | | | 5 | | | |
| *Phalaris arundinacea* | Reed canary grass | FACW | non | 0.0 | | | | | | | | | | |
| *Vulpia myuros* | Rat-tail fescue | NOL | non | 1.0 | | | | | | | 5 | 5 | | |
| | | | | 25.0 | | | | | | | | | | |
| Bareground: | | Mean= | 0.0 | | | | | | | | | | | |
| Open Water: | | Mean= | 3.5 | | 10 | | 10 | | | | | | 15 | |
| Relative % listed species invasive canopy cover : | | Mean= | 0.00 | | | | | | | | | | | |
| Listed species includes reed canary grass, Himalayan Blackberry, evergreen blackberry, purple loosestrife, kudzu, Japanese knotweed and poison hemlock. | | | | | | | | | | | | | | |
| Number of native species = 23 | | | | | | | | | | | | | | |
| Species of Sedge = 4 | | | | | | | | | | | | | | |
| Species of Rush = 4 | | | | | | | | | | | | | | |
| Species of Native Forbs = 11 | | | | | | | | | | | | | | |
| % native canopy cover (Excludes bare substrate): | | Mean= | 94.50 | | 90.0 | 100.0 | 90.0 | 95.0 | 100.0 | 100.0 | 90.0 | 95.0 | 85.0 | 100.0 |

# Frazier Creek Wetland Mitigation Bank
## Hedge Row Plot Data - June 07, 2013

| Common Name | Botanical Name | Status | Origin | Cover | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tree Species - % aerial coverage within 10' length of hedgerow unless noted** | | | | | | | | | | | | | | | |
| *Fraxinus latifolia* | Oregon ash | FACW | native | 1.36 | | | | | 5 | 10 | | | | | |
| *Rhamnus purshiana* | Cascara | FAC | native | 0.45 | | | | | | | | | | | 5 |
| *Salix ssp.* | Willow ssp. | FACW | native | 27.73 | 5 | 50 | 40 | 30 | | 30 | 10 | 5 | 20 | 50 | 65 |
| **Scrub/Shrub Species -% aerial coverage within 10' length of hedgerow** | | | | | | | | | | | | | | | |
| *Rosa nutkana* | Nootka rose | FAC | native | 33.64 | 50 | 20 | 35 | 30 | 30 | 30 | 40 | 50 | 40 | 25 | 20 |
| *Rosa pisocarpa* | Clustered rose | FAC | native | 32.27 | 45 | 20 | 25 | 40 | 30 | 30 | 45 | 45 | 40 | 25 | 10 |
| | | | | | | | | | | | | | | | |
| Total Cover by Trees and Shurbs | | | | | 100 | 90 | 100 | 100 | 65 | 100 | 95 | 100 | 100 | 100 | 100 |
| Average % Cover Trees and shru | mean= | 95.5 | | | | | | | | | | | | | |
| Average row width (feet) | mean | 15.5 | | | 14 | 20 | 16 | 16 | 10 | 15 | 14 | 1 6 | 22 | 22 | 22 |
| Average shrub height (feet) | mean= | 8.5 | | | 7 | 8 | 8 | 8 | 8 | 10 | 8 | 7 | 9 | 10 | 10 |
| Average tree height (feet) | mean= | 25.1 | | | 16 | 20 | 15 | 20 | 8 | 20 | 14 | 15 | 18 | 30 | 25 |
| | | | | | | | | | | | | | | | |
| * 2 plots were removed from monitoring. They are on the rock berms and are sprayed yearly. | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| **Herbaceous Species - percent cover** | | | | | | | | | | | | | | | |
| *Alisma gramineum* | Narrow leaf water plantain | OBL | native | 1.36 | | | | 15 | | | | | | | |
| *Bidens frondosa* | Leafy beggars-tick | FACW | native | 0.00 | | | | | | | | | | | |
| *Carex densa* | Dense sedge | OBL | native | 5.45 | | | | 5 | 15 | 5 | 15 | 10 | 10 | | |
| *Carex obnupta* | Slough sedge | OBL | native | 0.45 | | | | | | 5 | | | | | |
| *Carex unilateralis* | One-sided sedge | FACW | native | 1.45 | | | | 1 | | 5 | 5 | | 5 | | |
| *Cirsium arvense* | Canada thistle | FACU | non | 0.00 | | | | | | | | | | | |
| *Eleocharis palustris* | Creeping spike rush | OBL | native | 1.36 | | 10 | | | | | 5 | | | | |
| *Epilobium ciliatum* | Fringed willoweed | FACW- | native | 0.00 | | | | | | | | | | | |
| *Epilobium watsonii* | Watson's willow herb | FACW | native | 0.00 | | | | | | | | | | | |
| *Juncus effusus* | Soft rush | FACW | native | 2.27 | | | | 10 | | 5 | 5 | | 5 | | |
| *Lactuca serriola* | Prickly lettuce | FACU | non | 0.00 | | | | | | | | | | | |
| *Mentha pulegium* | Pennyroyal | OBL | non | 0.09 | | | | 1 | | | | | | | |
| *Myosotis laxa* | Small-flowered forget me n | OBL | native | 1.82 | | | | | 20 | | | | | | |
| *Parentucellia viscosa* | Yellow parentucellia | FAC | non | 0.00 | | | | | | | | | | | |
| *Rubis discolor* | Himalayan blackberry | FACU | non | 0.00 | | | | | | | | | | | |
| *Rumex crispus* | Cury dock | FAC | non | 0.18 | | | | | | 1 | | 1 | | | |
| *Sonchus asper* | Spiny sow thistle | FAC | non | 0.00 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| **Grass Species - percent cover** | | | | | | | | | | | | | | | |
| *Agrostis exarata* | Spike bentgrass | FACW | native | 0.00 | | | | | | | | | | | |
| *Alopecurus pratensis* | Meadow foxtail | FACW | non | 0.00 | | | | | | | | | | | |
| *Beckmania syzigachne* | Slough grass | OBL | native | 2.82 | | | | 5 | 20 | | 5 | 1 | | | |
| *Deschampsia cespitosa* | Tufted hairgrass | FACW | native | 0.91 | | | | 5 | | | | | 5 | | |
| *Hordeum brachyantherm* | Meadow barley | FACW | native | 3.27 | | | | | 30 | | 5 | 1 | | | |
| *Lolium multiflorum* | Annual reygrass | NOL | non | 0.00 | | | | | | | | | | | |
| *Poa ssp.* | Bluegrass | FAC | non | 0.00 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| Total Cover by herbaceous and grass species: | | Mean= | 21.5 | | 0 | 10 | 0 | 42 | 85 | 21 | 40 | 13 | 25 | 0 | 0 |
| Percentage of the herbaceous and grass species that is nat | | Mean = | 97.88 | | 0 | 100 | 0 | 97.6 | 100 | 95.2 | 100 | 92.3 | 100 | 0 | 0 |
| Relative % listed species invasive canopy cover : | | Mean= | 0.00 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Listed species includes reed canary grass, Himalayan Blackberry, evergreen blackberry, purple loosestrife, kudzu, Japanese knotweed and poison hemlock. | | | | | | | | | | | | | | | |

Attachment 1: Monitoring Data

# Frazier Creek Wetland Mitigation Bank

## Ash Plot Data and Willow Area - June 07, 2013

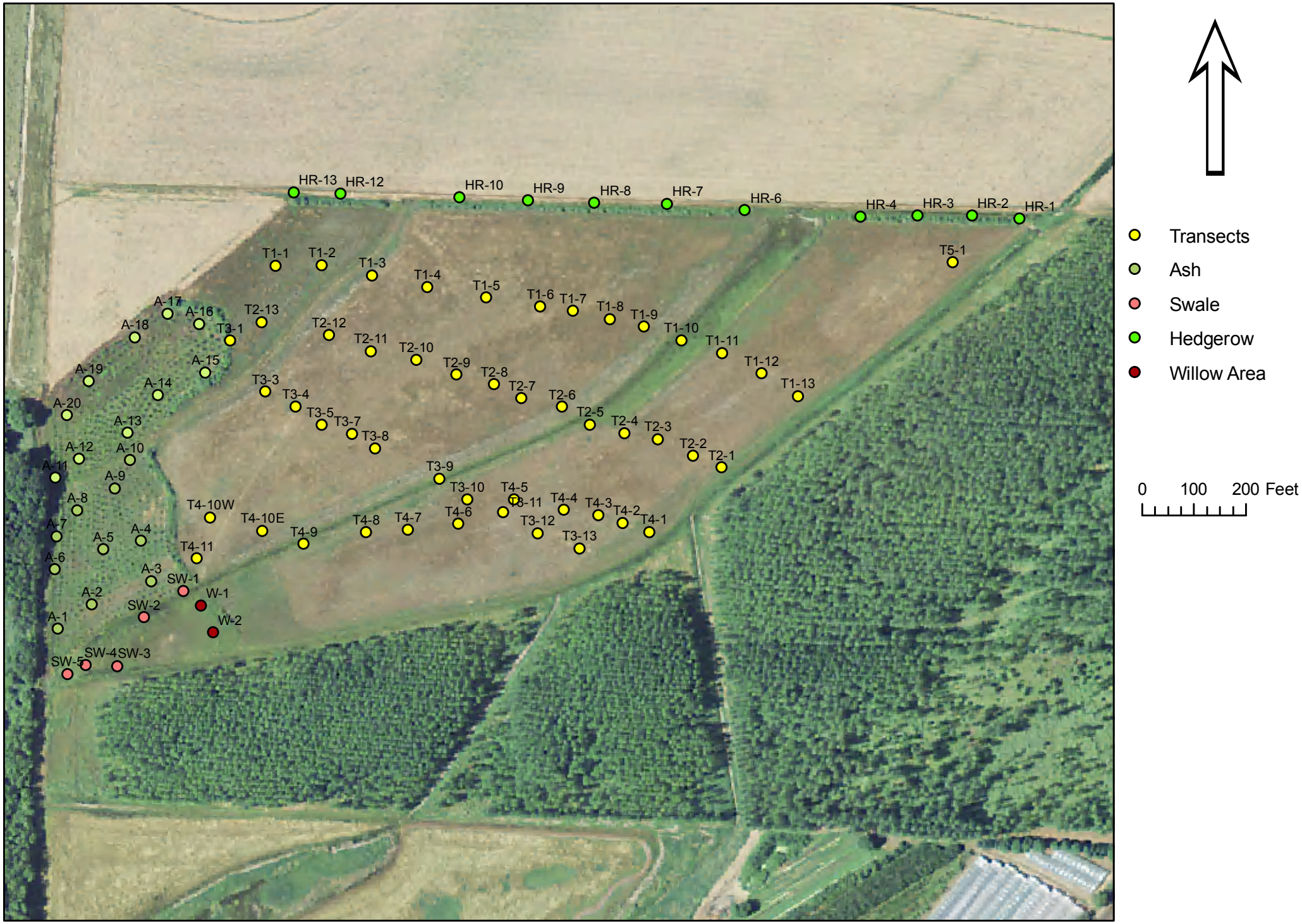
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number of Ash Trees - stem count within 20' radius.** | | | | | 24 | 13 | 9 | 8 | 20 | 18 | 22 | 18 | 14 | 7 | 48 | 9 | 9 | 9 | 7 | 8 | 10 | 12 | 8 | 12 |
| Number of non-saplings | | 10.4 | | | 18 | 12 | 9 | 8 | 15 | 9 | 16 | 12 | 8 | 6 | 15 | 8 | 8 | 9 | 7 | 8 | 10 | 12 | 8 | 10 |
| Average height in feet (not including new saplings) | | | | | 12 | 9 | 9 | 13 | 11 | 12 | 12 | 10 | 9 | 8 | 14 | 13 | 15 | 15 | 15 | 16 | 15 | 12 | 10 | 9 |
| Average of all trees per plot = | | 14.25 | | | | | | | | | | | | | | | | | | | | | | |
| Average non-saplings* per plot = | | 10.4 | | | | | | | | | | | | | | | | | | | | | | |
| Average height of non-saplings per plot = | | 12.0 | | | | | | | | | | | | | | | | | | | | | | |
| *trees greater than 3' in height | | | | | | | | | | | | | | | | | | | | | | | | |
| *Crataegus douglasii* | Douglas Hawthorn | FAC | native | | | | | | 1 | | | | | | | | | | | | | | | |
| Number of non-sapling trees/ac | | 360.7 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| **Herbaceous Species - percent cover in 3' x 3' plot (center of 20' radius plots)** | | | | | | | | | | | | | | | | | | | | | | | | |
| *Carex densa* | Dense sedge | OBL | native | 7.25 | | | 20 | 25 | | 45 | 15 | | 20 | 15 | | | | 5 | | | | | | |
| *Carex feta* | Green-sheath sedge | FACW | native | 2.75 | | | | | | | | | | | 15 | | | 10 | 30 | | | | | |
| *Carex obnupta* | Slough sedge | OBL | native | 0 | | | | | | | | | | | | | | | | | | | | |
| *Carex unilaterils* | One-sided sedge | FACW | native | 15 | 5 | | 10 | 35 | | | 30 | 70 | | | 15 | | 65 | 70 | | | | | | |
| *Centuarium umbellatum* | Common centuray | FAC | non | 0.25 | | | | | 5 | | | | | | | | | | | | | | | |
| *Epilobium watsonii* | Watson's willow herb | FACW | native | 0 | | | | | | | | | | | | | | | | | | | | |
| *Geum macrophyllum* | Oregon Avens | FACW | native | 3.75 | | | | | | | 15 | | | 60 | | | | | | | | | | |
| *Geranium visosissimum* | Crane's bill geranium | FACU | non | 1 | | 5 | | | 5 | | | 5 | | | | | 5 | | | | | | | |
| *Hypochaeris radicata* | catsear dandelion | FACU | non | 0 | | | | | | | | | | | | | | | | | | | | |
| *Juncus bufonius* | Toad rush | FACW | native | 0.5 | | | | | 10 | | | | | | | | | | | | | | | |
| *Juncus tenuis* | Slender rush | FACW | native | 3.25 | | | | 20 | | 15 | | | | | | | 10 | | 20 | | | | | |
| *Kickxia elatine* | Sharp-point fluellin | UPL | non | 0.75 | | | | | 10 | | | | | | | | | | | | | 5 | | |
| *Lythrum portula* | Spatulaleaf loosestrife | NOL | non | 0.5 | 5 | 5 | | | | | | | | | | | | | | | | | | |
| *Mentha pulegium* | Pennyroyal | OBL | non | 0.75 | | 5 | 5 | 5 | | | | | | | | | | | | | | | | |
| *Navarettia squarosa* | Skunkweed | FACU | native | 1.5 | | 20 | | | 10 | | | | | | | | | | | | | | | |
| *Peplis portula* | Water- purslane | NOL | non | 0 | | | | | | | | | | | | | | | | | | | | |
| *Plagiobothrys figuratus* | Fragrant popcorn flowe | FACW | native | 0.75 | 5 | 10 | | | | | | | | | | | | | | | | | | |
| *Rorippa curvisiliqua* | Western yellowcress | OBL | native | 0.75 | 5 | | | | | | 5 | | | | | 5 | | | | | | | | |
| *Rubus discolor* | Himalayan blackberry | FACU | non | 0 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| **Grass Species - percent cover in a 3' x 3' plot** | | | | | | | | | | | | | | | | | | | | | | | | |
| *Agrostis exarata* | Spike bentgrass | FACW | native | 0.5 | 5 | | | 5 | | | | | | | | | | | | | | | | |
| *Alopecurus geniculatus* | Water foxtail | OBL | native | 14.00 | 5 | 10 | | | | | 10 | | | | | 10 | | | 10 | 40 | 35 | 50 | 40 | 70 |
| *Alopecurus pratensis* | Meadow foxtail | FACW | non | 0.00 | | | | | | | | | | | | | | | | | | | | |
| *Avena sp.* | Wild oat | NOL | non | 0.00 | | | | | | | | | | | | | | | | | | | | |
| *Beckmania syzigachne* | Slough grass | OBL | native | 0.75 | | | | 5 | | | | | | | | | | 5 | 5 | | | | | |
| *Bromus carinatus* | California brome | NOL | native | 0.00 | | | | | | | | | | | | | | | | | | | | |
| *Deschampsia cespitosa* | Tufted hairgrass | FACW | native | 0.75 | | | 15 | | | | | | | | | | | | | | | | | |
| *Deschampsia danthonioides* | Annual hairgrass | FACW- | native | 1.25 | | | | | | | | | | | | | | | | 10 | | 10 | | 5 |
| *Glyceria occidentalis* | Western mannagrass | OBL | native | 1.25 | 5 | | | | | | 10 | | | | | | | | | | 10 | | | |
| *Holcus lanatus* | Velvet grass | FAC | non | 0.25 | | | | | | | | | | | | | 5 | | | | | | | |
| *Hordeum brachyantherm* | Meadow barley | FACW | native | 12.75 | 5 | | 5 | | 10 | | 10 | | | | 30 | 5 | | 5 | 5 | 40 | 50 | 25 | 50 | 15 |
| *Lolium multiflorum* | Annual reygrass | NOL | non | 0.00 | | | | | | | | | | | | | | | | | | | | |
| *Panicum capillare* | Common witchgrass | FACU | native | 0.25 | 5 | | | | | | | | | | | | | | | | | | | |
| *Poa trivialis* | Rough-stalk bluegrass | FACW | non | 3.00 | 5 | | | 5 | | 5 | 5 | 5 | | 5 | 5 | | | 5 | | | 5 | | 10 | 5 |
| *Ventenata dubia* | Red brome | NOL | non | 0.00 | | | | | | | | | | | | | | | | | | | | |
| *Vulpia myuros* | Rat-tail fescue | NOL | non | 1.75 | | 5 | | | | | | | 10 | | | | 5 | | | 10 | | | | 5 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Bareground due to recent spraying: | | mean= | 24.75 | | 50 | 40 | 45 | | 50 | 35 | | 20 | 70 | 20 | 35 | 80 | 10 | | 30 | | | 10 | | |
| Percent native groundcover | | mean= | 66.5 | | 35 | 30 | 50 | 90 | 35 | 60 | 95 | 70 | 20 | 75 | 60 | 20 | 75 | 95 | 70 | 90 | 95 | 85 | 90 | 90 |
| Percent total vegetation cover: | | Mean= | 75.25 | | 50 | 60 | 55 | 100 | 50 | 65 | 100 | 80 | 30 | 80 | 65 | 20 | 90 | 100 | 70 | 100 | 100 | 90 | 100 | 100 |

Attachment 1: Monitoring Data

| | | | | | | |
|---|---|---|---|---|---|---|
| **Shrub Willow Wetland (0.2 acres)** | | | | | | |
| 0-5' height | 256 | | | | | |
| 5-12' | 44 | | | | | |
| 13'+ | 7 | | | | | |
| **Total Willows found** | **307** | | | | | |
| Cottonwood | 2 | | | | | |
| Hawthorn | 2 | | | | | |
| Ash | 2 | | | | | |
| **Total Trees/Shrubs** | **313** | | | | | |
| **Aeriel Coverage** | **50%** | | | | | |
| | | | | | | |
| **Herbaceous/Grass Species - percent cover in 3' x 3' plot** | | | | | | |
| | | | | **AVG** | **1** | **2** |
| | | | | | | |
| *Agrostis exarata* | Spike bentgrass | FACW | native | 10 | | 20 |
| *Alopecurus geniculatus* | Water foxtail | OBL | native | 47.5 | 55 | 40 |
| *Beckmania syzigachne* | Slough grass | OBL | native | 0 | | |
| *Hordeum brachyantherm* | Meadow barley | FACW | native | 12.5 | 15 | 10 |
| *Juncus bufonius* | Toad rush | FACW | native | 7.5 | | 15 |
| *Kickxia elatine* | Sharp-point fluellin | UPL | non | 2.5 | | 5 |
| *Navarettia squarosa* | Skunkweed | FACU | native | 2.5 | 5 | |
| *Parentucellia viscosa* | Yellow parentucellia | FAC | non | 2.5 | 5 | |
| *Plagiobothrys figuratus* | Fragrant popcorn flowe | FACW | native | 5 | 5 | 5 |
| *Plagiobothrys scouleri* | Scouler's popcorn flowe | FACW | native | 5 | 10 | |
| *Poa trivialis* | Rough-stalk bluegrass | FACW | non | 5 | 5 | 5 |
| | | | | | | |
| Bareground: | | | | | | |
| Percent native groundcover | | Mean= | 90.0 | | 90 | 90 |
| Percent total vegetation cover: | | Mean= | 100.0 | | 100 | 100 |
| | | | | | | |
| **Northern Perimeter of Forested wetland** | | | | | | |
| | | | | | | |
| **Overstory species present** | | **Average Height(ft)** | | | | |
| *Crataegus douglasii* | Douglas Hawthorn | 10 | | | | |
| *Fraxinus latifolia* | Oregon ash | 17 | | | | |
| *Populus trichocarpa* | Black cottonwood | 11 | | | | |
| *Salix lasiandra* | Pacific willow | 22 | | | | |
| | **Mean:** | 15 | | | | |
| **Aeriel Coverage** | **40%** | | | | | |
| **Shrub species present** | | **Average Width (ft)** | | | | |
| *Cornus sericea* | Red osier dogwood | 6 | | | | |
| *Douglas spirea* | Spiraea douglasii | 10 | | | | |
| *Rosa nutkana* | Nootka rose | 30 | | | | |
| *Rosa pisocarpa* | Clustered rose | 30 | | | | |
| | **Mean:** | 19 | | | | |
| **Aeriel Coverage** | **55%** | | | | | |

Attachment 2: Monitoring Map

# Frazier Creek Mitigation Bank Monitoring Points



# Frazier Creek Mitigation Bank 2013 Photo Monitoring

Photo 1 T-1 West

Photo 2  T2-7 Northwest

Photo 3 T2-1 West

Photo 4 T2-1 Southeast

Photo 5 T4-9 North

Photo 6  T2-10 Northeast

Photo 7 SW across swale

Photo 8 Willow area West

Photo 9 Willow area Southwest

Photo 10 A-2 Northwest

Photo 11 Ash area SW corner

Photo 12  A-5 Northwest

Attachment 3:  Monitoring Photos

Photo 13  T2-12 Northwest

Photo 14  T3-8 East

Photo 15  T4-9 Northeast

Photo 16 T2-9 East

Photo 17  T0-1 East

Photo 18 T2-12 East

Photo 19  T2-7