

# Butler Mitigation Bank:

## Monitoring Report for 2013 Growing Season



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## **Restoration Activities Conducted Between Fall 2012 and Fall 2013**

During 2013, the western half of the Butler mitigation bank was seeded and planted. Maintenance activities, including spot spraying non-native species, mowing around planted woody species, cutting of blackberry, and mowing of prairie areas were conducted in order to achieve re-vegetation goals (Table 1).

**Table 1. Approximate date, maintenance treatments, and estimated acres treated during the 2013 growing season.**

<b>Work Date</b>	<b>Type of Work</b>	<b>Area Treated (Acres)</b>
11/2012	Seeding of west field	50
4/2013	Planting of west field	12
5/2013	Spot spraying broadleaf weeds	65
7/2013	Field Mowing/Line mowing	40
7/2013	Spot Spraying broadleaf weeds	65
7/2013	Broadcast spraying of east field	30
8/2013	Discing east field 3 times	30
10/13	Spot spraying broadleaf weeds	65

### **Next Steps**

In 2014, the primary focus will be on plant establishment and the reduction of weedy species cover throughout planted areas. Activities will include:

- Two maintenance spot sprays each covering the entire 50 acre west field, plus 8 acres of newly planted areas in the east field. One treatment will occur in the spring and one in the fall. At least one treatment will be a circle spray around newly planted plants.
- Flail mow or cut and bale on 20 acres of the west field after native grasses and forbs set seed.
- Mow between rows of planted shrubs and trees in order to improve growth and survival in planting areas.
- Continue to prep the east field for planting by conducting broadcast spraying and discing.

### **Performance Standards and Monitoring Methods**

Ecologically-based performance standards have been established to determine whether the mitigation project is achieving its objectives. The performance standards are adapted from DSL's "routine" performance standards and are to be met annually for a minimum of five years unless stated otherwise. The standards set goals for each of the habitat units in the project areas. Annual vegetation monitoring is intended to determine whether these goals are being met.

In 2013, the decision was made to proceed with construction and plant establishment in the western half of the project area and to construct the remainder of the project in 2015. The acreages for each of the habitat units monitored in 2013 were reduced to those present in the constructed portion of the project. The total number of monitoring plots for each habitat area was proportionally reduced to reflect those reduced acreages. The number of monitoring plots sampled per plant community is shown in Table 2 below. For the most part, the systematic sampling methodology described in the Butler Mitigation Bank Instrument was followed. See Map 1 for the locations of sampling points. The site was stratified into habitat classes and sampling plots were randomly located using primarily systematic sampling in order to ensure coverage within the habitat class. Permanent transects were established. For herbaceous vegetation, visual estimates of cover were made, by species, on one-meter-square plots. For woody vegetation, monitoring plots were 1/100th hectare, circular plots.

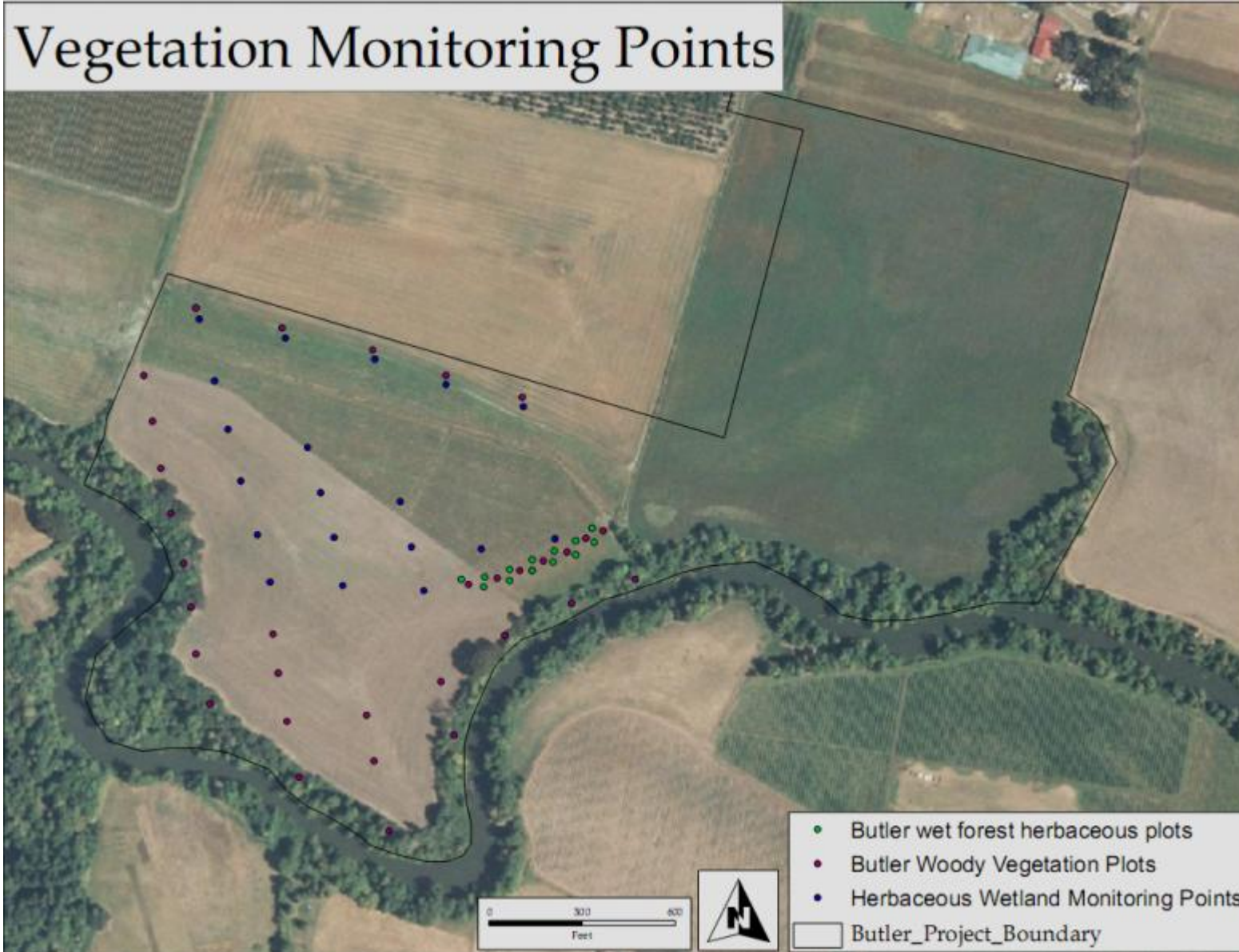
There were two primary deviations from the systematic sampling methodology. First, at the time of sampling, several of the plots that should have been sampled were in water too deep to allow for sampling. We anticipate that these same plots will always be in too much water for sampling. These plots were redistributed in shallower locations. Secondly, two plant communities (upland prairie and forested wetlands) were so narrow that no sampling locations from the systematic sampling fell within their boundaries. Because the upland prairie plant community is so narrow and small there was not enough room to conduct the necessary number of samples in any meaningfully randomized way. Additionally, it was determined that such a small and narrow band of upland prairie would not be sustainable over the long term. Therefore, the upland prairie in the currently constructed portion of the project will be turned into scrub habitat for pollinators and songbirds. No sampling was done there. In the forested wetlands, we established two transects within the habitat zone and conducted systematic sampling within the plant community.

**Table 2- Number of monitoring plots sampled per plant community.**

<b>Phase 1 Sampling</b>			
<b>Plant Community</b>	<b>Total Acres</b>	<b>Herbaceous plots sampled</b>	<b>Woody plots sampled</b>
Upland Prairie (will become scrub buffer)	1	0	0
PEM (emergent wetland and wet prairie)	28	19	0
Forested wetlands	4.5	13	7
New Riparian Forest	8.5	0	10
Scrub Buffer	1.12	0	5
Existing Riparian Forest	7	0	10
<b>TOTAL</b>	<b>50</b>	<b>32</b>	<b>32</b>

Map 1

# Vegetation Monitoring Points



## **Vegetation Monitoring Objectives**

At the Butler Mitigation Bank, objectives were established for each of the distinct plant communities present or being constructed. The following are the standards as described in the Butler Mitigation Bank Instrument:

### Herbaceous Wetlands

- 28.00 acres emergent wetland,

Performance Standard: The cover of native species will be at least 60%; the cover of invasive species is no more than 10%; bare substrate represents no more than 20% cover in years 3 through 5 after planting. By year 3 and thereafter, there are at least 10 different native species of grasses, sedges, rushes and forbs providing significant cover. Significant cover means a species must have at least 5% average cover in the habitat class, or occur in at least 10% of the plots sampled, and have a prevalence index <3.0. In addition, non-grass species must comprise at least 30 % of total vegetative cover.

### Forested Wetlands

- 4.5 acres of palustrine forested wetland

Performance Standard: In years 3 and 5 after planting, stocking meets or exceeds 1800 stems per acre minimum stocking of all woody species. If irrigation or plant replacement are necessary to achieve this standard, the 5th-year standard will be delayed until two years after the irrigation or interplanting treatments are completed. The cover of native herbaceous species is at least 60%; the cover of invasive herbaceous species is no more than 10%. After the site has matured to the stage when desirable canopy species reach 50% cover, the cover of invasive understory species may increase but may not exceed 30%. The cover of invasive shrub or tree species is no more than 10%; bare substrate represents no more than 20% cover in years 3 through 5 after planting. By year 3 and thereafter, there will be at least 6 different native woody species providing significant cover. To qualify, a species must have at least 5% average cover in the habitat class, or occur in at least 10% of the plots sampled; and prevalence index <3.0. The density of woody vegetation is at least 1,600 stems/acre, including live planted and native volunteers.

### Buffers

#### Woody Buffers

- 7 acres existing riparian forest
- 1 acre scrub
- 8.5 acres proposed new riparian forest

Performance Standard: For the second season and thereafter, the cover of native species is at least 60% and the cover of invasive species is no more than 10%. In forested and scrub habitats, after the site has matured to the stage when desirable canopy species reach 50% cover, the ground cover of invasive species may increase but not exceed 30%. In existing riparian stands, Himalayan blackberry cover will be no more than 5% average cover of the total area, and treated areas replanted to initial stocking densities prior to the first credit release. In years 3 and 5 in all woody buffer types, stocking meets or exceeds 1800 stems per acre minimum stocking of all woody species. If irrigation or plant replacement are necessary to achieve this standard, the 5th-year standard will be delayed until two years after the irrigation or interplanting treatments are completed.

### Upland Prairie Buffer

- 1 acre upland prairie

Performance Standard: The cover of native species will be at least 60%; the cover of invasive species is no more than 10%; bare substrate represents no more than 20% cover in years 3 through 5 after planting.

By year 3 and thereafter, there are at least 4 different native species of grasses, sedges, rushes and forbs providing significant cover, at least two of which are not grasses. Significant cover means a species must have at least 5% average cover in the habitat class, or occur in at least 10% of the plots sampled.

## **Results**

### **Herbaceous Species Monitoring Overview**

The Braun-Blanquet Cover Abundance Scale Braun-Blanquet (Mueller-Dombois et al. 1974) was used to estimate vegetation percent cover. The Braun-Blanquet Cover Abundance Scale is broken down with the following arrangement to determine percent cover, five is equal or greater than 75 percent cover; four equals 50-75 percent cover; three equals 25-50 percent cover; two equals 5-25 percent cover; one is numerous individual plants, clumped or scattered, but less than 5 percent total cover, + equals few plants with one percent or less cover, and an r equals solitary individuals of minimal cover.

A total of 32 plots were sampled for herbaceous in the mitigation bank. The plots were divided between the emergent wetland community and the forested wetland community. Overall, 44 species of herbaceous plants were found through the sampling. Of these, a total of 15 were known non-native species, 27 were known native species, and the status of 2 species was unknown. While over 33% of the species found were non-native, the vast majority of the cover in all plots was made up of native species.

Within the emergent wetland community, the percent cover of native species found within the sampled areas was approximately 93.5%. The percent cover of non-native species found within the sampled areas was approximately 12.6%. The percent cover of bare ground found within the sampled area is approximately 7.3%.

Within the forested wetland community, the percent cover of native species found within the sampled areas was approximately 84.7%. The percent cover of non-native species found within the sampled areas was approximately 9.1%. The average percent cover of bare ground found within the sampled area was approximately 11.4%.

**Table 3- All Herbaceous Species Sampled**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Native Status</b>
<i>Agrostis exarata</i>	Spike bentgrass	yes
<i>Alisma plantago-aquatica</i>	American water plantain	yes
<i>Alopecurus geniculatus</i>	water foxtail	yes
<i>Anthemis cotula</i>	Dog fennel	no
<i>Beckmannia syzigachne</i>	American sloughgrass	yes
<i>Cirsium arvense</i>	canada thistle	no
<i>Daucus carota</i>	queen annes lace	no
<i>Deschampsia caespitosa</i>	Tufted hairgrass	yes
<i>Deschampsia elongata</i>	Slender hairgrass	yes
<i>Downingia elegans</i>	elegant calicoflower	yes
<i>Echinochloa crus-galli</i>	barnyard grass	no
<i>Eleocharis ovata</i>	Ovate spikerush	yes

<i>Epilobium densiflorum</i>	denseflower willow herb	yes
<i>Gnaphalium palustre</i>	Western marsh cudweed	yes
<i>Gnaphalium uliginosum</i>	Marsh cudweed	no
<i>Grindelia integrifolia</i>	willamette valley gumweed	yes
<i>Hordeum brachyantherum</i>	meadow barley	yes
<i>Juncus bufonius</i>	Toad rush	yes
<i>Juncus ensifolius</i>	daggerleaf rush	yes
<i>Juncus patens</i>	spreading rush	yes
<i>Kickxia elatine</i>	cancerwort	no
<i>Lactuca muralis</i>	wall lettuce	No
<i>Lactuca serriola</i>	Prickly lettuce	No
<i>Leersia oryzoides</i>	rice cutgrass	yes
<i>Lotus corniculatus</i>	bird foot trefoil	No
<i>Lotus purshianus</i>	spanish clover	yes
<i>Lythrum portula</i>	spatula leaf loosestrife	No
<i>Montia linearis</i>	springbeauty	yes
<i>Panicum L.</i>	Panic grass	unk.
<i>Microsteris gracilis</i>	Phlox species	yes
<i>Plagiobothrys scouleri</i>	popcorn flower	yes
<i>Polygonum arenastrum</i>	prostrate knotweed	No
<i>Potentilla gracilis</i>	slender cinquefoil	yes
<i>Prunella vulgaris</i>	common self heal	yes
<i>Ranunculus occidentalis</i>	western buttercup	yes
<i>Rorippa curvisiliqua</i>	western yellow cress	yes
<i>Rumex crispus</i>	curly dock	No
<i>Rumex salicifolius</i>	willow dock	yes
<i>Sagittaria latifolia</i>	Wapato	yes
<i>Scirpus validus</i>	softstem bullrush	yes
<i>Sidalcea campestris</i>	meadow checkerbloom	yes
<i>Sonchus asper</i>	sow thistle	No
<i>Trifolium repens</i>	white clover	No
<i>Vicia sp</i>	vetch	No

### Woody Species Sampling Overview

Within each of the plant communities containing woody species surveyors collected data in 11.8-foot-radius (1/100-acre) circular plots. All woody plants in each plot, whether planted or naturally occurring, were identified, counted and assessed for vigor.

Plant vigor was separated into three categories, high, medium and low. Plants with high vigor exhibited remarkable growth and health. Plants with medium vigor were expected to live beyond the current growing season and exhibit moderate growth. Plants with low vigor had a reduced probability of

surviving beyond the current growing season. Other items noted include mortality and possible causes, animal activity, presence or absence of weedy plant species and other natural resource observations. A total of 32 plots were sampled within four distinct communities: scrub shrub buffers, existing forested buffers, new forested buffers, and forested wetlands. All species sampled were native due to the fact that extensive control efforts were conducted across the site for non-native species prior to vegetation monitoring. A total of 27 native species were found during sampling in the first round of woody vegetation sampling. These species are listed in Table 4 below.

**Table 4- All Woody species sampled**

<b>Scientific Name</b>	<b>Common Name</b>
<i>Abies grandis</i>	Grand fir
<i>Acer circinatum</i>	Vine maple
<i>Acer macrophyllum</i>	Big leaf maple
<i>Amelanchier alnifolium</i>	Serviceberry
<i>Cornus sericea</i>	Red osier dogwood
<i>Corylus cornuta</i>	Beaked hazelnut
<i>Cragaegus douglasii</i>	Black hawthorn
<i>Fraxinus latifolia</i>	Oregon ash
<i>Holodiscus discolor</i>	Oceanspray
<i>Lonicera involucrata</i>	Twinberry
<i>Mahonia aquifolium</i>	Tall Oregon grape
<i>Oemleria cerasiformis</i>	Indian plum
<i>Philadelphus lewisii</i>	Mock orange
<i>Physocarpus capitatus</i>	Ninebark
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Prunus virginiana</i>	Choke cherry
<i>Pseudotsuga menziesii</i>	Doug fir
<i>Quercus garryana</i>	Oregon white oak
<i>Rosa pisocarpa</i>	Swamp rose
<i>Rubus parviflorus</i>	Thimbleberry
<i>Salix sp.</i>	Willow
<i>Sambucus cerulea</i>	Blue elderberry
<i>Sambucus racemosa</i>	Red elderberry
<i>Spiraea douglasii</i>	Douglas spiraea
<i>Symphoricarpos albus</i>	Snowberry
<i>Taxus brevifolia</i>	Pacific yew
<i>Thuja plicata</i>	Western red cedar



### Herbaceous Wetland Monitoring

Herbaceous species monitoring was conducted at Butler in late June, 2013. In the herbaceous wetlands, a total of 19 plots were sampled to assess native herbaceous species cover, non-native species cover and the percent of bare ground within the herbaceous wetland plant communities.

Five permanent transects were established within this community. See Map 1 for their approximate locations.

The average percent cover of native species found within the sampled areas is approximately 93.5%. The average percent cover of non-native species found within the sampled areas is approximately 12.6%. The average percent cover of bare ground found within the sampled area is approximately 7.3%. At this time, native species cover greatly exceeds the project objective of 60%, non-native species slightly exceed the maximum threshold established of 10%, and bare ground is below the maximum threshold established of 20%. Though the non-native species cover currently exceeds the maximum threshold, most of those species will be short lived and fade out as the wetland and prairie species become more established. The only species of concern in the project area are Canada thistle and white clover, both of which will warrant aggressive control over the next two years.

Numerous native species are already established at cover levels considered significant. Five species have greater than 5% cover, and 22 species showed up in more than 10% of the monitoring plots. See tables 5 and 6 for lists of these species.

**Table 5- Native species with greater than 5% cover in herbaceous wetland community**

Scientific Name	Common Name
<i>Eleocharis ovata</i>	Ovate spikerush
<i>Downingia elegans</i>	elegant calicoflower
<i>Alisma plantago-aquatica</i>	American water plantain
<i>Deschampsia elongata</i>	slender hairgrass
<i>Juncus bufonius</i>	Toad rush

**Table 6- Native species occurring in more than 10% of the monitoring plots in herbaceous wetland community**

Scientific Name	Common Name
<i>Rorippa curvisiliqua</i>	Western yellow cress
<i>Scirpus validus</i>	softstem bullrush
<i>Prunella vulgaris</i>	common self heal
<i>Plagiobothrys scouleri</i>	popcorn flower
<i>Montia linearis</i>	springbeauty
<i>Lotus purshianus</i>	spanish clover
<i>Leersia oryzoides</i>	rice cutgrass
<i>Juncus ensifolius</i>	daggerleaf rush
<i>Juncus bufonius</i>	Toad rush
<i>Hordeum brachyantherum</i>	meadow barley

<i>Grindelia integrifolia</i>	willamette valley gumweed
<i>Gnaphalium uliginosum</i>	Marsh cudweed
<i>Gnaphalium palustre</i>	Western marsh cudweed
<i>Epilobium densiflorum</i>	denseflower willow herb
<i>Eleocharis ovata</i>	Ovate spikerush
<i>Downingia elegans</i>	elegant calicoflower
<i>Deschampsia elongata</i>	slender hairgrass
<i>Deschampsia cespitosa</i>	tufted hairgrass
<i>Beckmannia syzigachne</i>	American sloughgrass
<i>Alopecurus geniculatus</i>	water foxtail
<i>Alisma plantago-aquatica</i>	American water plantain
<i>Agrostis exarata</i>	Spike bentgrass

### Forested Wetlands

#### Herbaceous species

In the forested wetlands, two transects containing a total of 13 plots were sampled to assess native herbaceous species cover, non-native species cover and the percent of bare ground. See Map 1 for their approximate locations.

The average percent cover of native species found within the sampled areas is approximately 84.7%. The average percent cover of non-native species found within the sampled areas is approximately 9.1%. The average percent cover of bare ground found within the sampled area is approximately 11.4%. At this time, native species cover greatly exceeds the project objective of 60%, non-native species are below the maximum threshold established of 10%, and bare ground is below the maximum threshold established of 20%. Numerous native species are already established at cover levels considered significant. Five species have greater than 5% cover, and 14 species showed up in more than 10% of the monitoring plots. See tables 7 and 8 for lists of these species.

**Table 7- Native species with greater than 5% cover in forested wetland community**

Scientific Name	Common Name
<i>Agrostis exarata</i>	Spike bentgrass
<i>Deschampsia caespitosa</i>	Tufted hairgrass
<i>Deschampsia elongata</i>	Slender hairgrass
<i>Downingia elegans</i>	elegant calicoflower
<i>Hordeum brachyantherum</i>	meadow barley

**Table 8- Native species occurring in more than 10% of the monitoring plots in forested wetland community**

Scientific Name	Common Name
<i>Agrostis exarata</i>	Spike bentgrass
<i>Alisma plantago-aquatica</i>	American water plantain
<i>Alopecurus geniculatus</i>	water foxtail
<i>Beckmannia syzigachne</i>	American sloughgrass

<i>Deschampsia caespitosa</i>	Tufted hairgrass
<i>Deschampsia elongata</i>	Slender hairgrass
<i>Downingia elegans</i>	elegant calicoflower
<i>Grindelia integrifolia</i>	willamette valley gumweed
<i>Hordeum brachyantherum</i>	meadow barley
<i>Potentilla gracilis</i>	slender cinquefoil
<i>Prunella vulgaris</i>	common self heal
<i>Ranunculus occidentalis</i>	western buttercup
<i>Rorippa curvisiliqua</i>	western yellow cress
<i>Rumex salicifolius</i>	willow dock

### **Forested Wetlands Woody species**

Seven plots were sampled in the forested wetland. Based upon plot data, there are approximately 1,357 plants per acre demonstrating moderate to high vigor. Approximately 486 plants per acre showed low vigor or were dead within the forested wetlands. The approximate percent survival of woody species in the forested wetlands is 74%. The initial target planting density was approximately 2,000 plants per acre and the stocking goal after year three is 1,600 plants per acre. With natural recruitment and growth over the next two years, we expect to easily achieve the 1,600 plants per acre goal.

The dominant species found within the forested wetland plots were *Spiraea douglasii*, *Cragaegus douglasii*, *Fraxinus latifolia*, *Cornus sericea*, and *Rosa pisocarpa*. See Table 9 for the species counts observed during sampling. No non-native woody species were observed during the sampling of the forested wetlands community.

**Table 9- Woody species counts within forested wetlands sampling plots.**

<b>Species</b>	<b>Count</b>
<i>Cornus sericea</i>	20
<i>Crataegus douglasii</i>	19
<i>Fraxinus latifolius</i>	24
<i>Rosa pisocarpus</i>	12
<i>Spiraea douglasii</i>	53

### **Existing Forest Buffer**

The sampling methodology used in the existing forest buffer was the same as in the forested wetlands. In the existing forest buffer we sampled in 10 plots and found exclusively native species. Several months prior to sampling, all blackberry and other weedy species had been removed. Within the sampled areas, 99.2% of the stems counted were live. Less than 1% were dead. Based on the data, there were approximately 5020 stems per acre. The dominant species were snowberry, hazelnut, ninebark, dogwood and Oregon grape. See table 10 for a list of species found during sampling.

In general the existing forested buffer is in remarkably good condition. A few small patches of blackberry and hawthorn were removed prior to the sampling. None of the sampling plots fell within those recently cleared areas, but those areas will be managed in the future to ensure weed populations are below required thresholds.

**Table 10- Woody species counts within existing forested buffer sampling plots.**

<b>Species</b>	<b>Count</b>
<i>Abies grandis</i>	1
<i>Acer circinatum</i>	18
<i>Amelanchier alnifolium</i>	9
<i>Cornus sericea</i>	29
<i>Corylus cornuta</i>	46
<i>Cragaegus douglasii</i>	19
<i>Fraxinus latifolia</i>	5
<i>Lonicera involucrata</i>	5
<i>Mahonia aquifolium</i>	29
<i>Oemleria cerasiformis</i>	12
<i>Philadelphus lewisii</i>	2
<i>Physocarpus capitatus</i>	34
<i>Prunus virginiana</i>	4
<i>Quercus garryana</i>	6
<i>Rosa pisocarpa</i>	2
<i>Sambucus racemosa</i>	2
<i>Symphoricarpus albus</i>	285
<i>Taxus brevifolia</i>	1
<i>Thuja plicata</i>	2

### **New Forest Buffers**

The sampling methodology used in the newly planted forest buffer was the same as in the forested wetlands. In the new forest buffer we sampled in 10 plots and found exclusively native woody species. Within the sampled areas, 96.5% of the stems counted were alive and 3.5% were dead. Based on the data, there were approximately 1370 live stems per acre. The dominant species were dogwood, ash, hawthorn, maple, Oregon grape, mock orange, and spiraea. See table 11 for a list of species found during sampling. While the existing stocking level does not achieve the goal of 1800 stems/acre, we expect that over the next few years there will be sufficient growth, recruitment, and sprouting of additional stems within the scrub shrub buffers to achieve the goal. If the goal is not achieved we will plant additional plants in order to ensure the goal is achieved.

In general the new forested buffer is in remarkably good condition. While the outside edges continue to have small patches of weeds such as clover, thistle, and blackberry, these patches have been easily controlled and have not impacted survival.

**Table 11- Woody species counts within existing forested buffer sampling plots.**

<b>Species</b>	<b>Count</b>
<i>Abies grandis</i>	3
<i>Acer circinatum</i>	16
<i>Acer macrophyllum</i>	3
<i>Cornus sericea</i>	24
<i>Crataegus douglasii</i>	17
<i>Fraxinus latifolium</i>	19
<i>Holodiscus discolor</i>	6
<i>Mahonia aquifolium</i>	13
<i>Philadelphus lewisii</i>	13
<i>Pinus ponderosa</i>	5
<i>Pseudotsuga menziesii</i>	1
<i>Quercus garryana</i>	2
<i>Rubus parviflorus</i>	2
<i>Salix sp.</i>	1
<i>Sambucus caerulea</i>	6
<i>Spiraea douglasii</i>	11

**Scrub Shrub Buffer**

The sampling methodology used in the scrub shrub buffer was the same as in the forested wetlands. In the scrub shrub buffer we sampled in 5 plots and found exclusively native woody species. Within the sampled areas, 100% of the stems counted were alive and none were dead. Based on the data, there were approximately 1280 live stems per acre. The dominant species were spiraea, swamp rose, Oregon grape and twin berry. See Table 12 for a list of species found during sampling. While the existing stocking level does not achieve the goal of 2000 stems/acre, we expect that over the next few years there will be sufficient growth, recruitment, and sprouting of additional stems within the new forest buffers to achieve the goal. If the goal is not achieved we will plant additional plants in order to ensure the goal is achieved.

In general the scrub shrub buffer is in good condition, though many of the plants installed here were small and will be vulnerable to being overtaken by grasses and other herbaceous species. The northern edge of the scrub shrub buffer continues to be problematic due to the adjacent clover field and difficulty of managing weed invasions. While we continue to aggressively spray this edge, we expect to have higher mortality in this area and more difficulty in establishing the density that we need. Aggressive monitoring and weed control will be required to maintain this area.

**Table 12- Woody species counts within scrub shrub buffer sampling plots.**

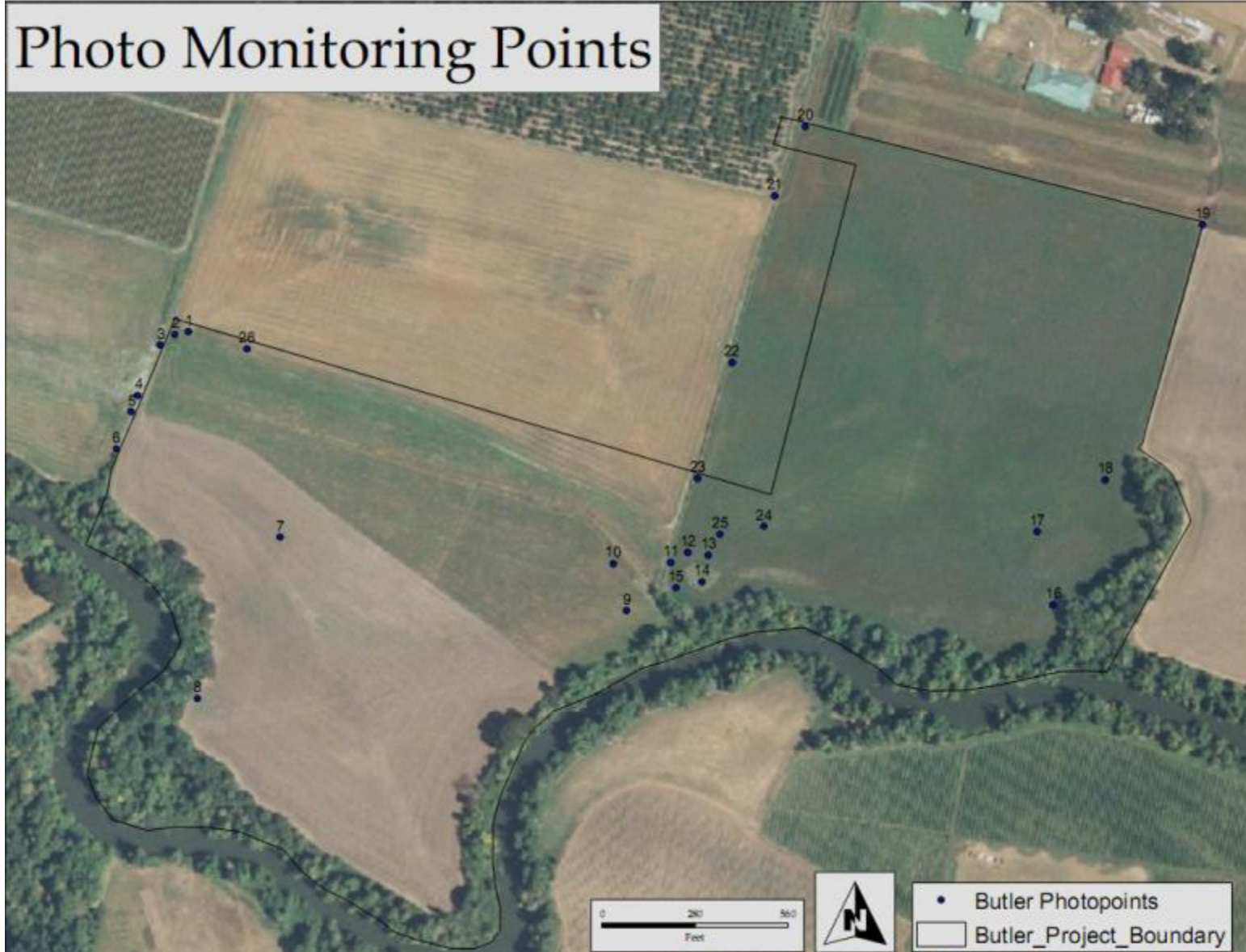
<b>Species</b>	<b>Count</b>
<i>cornus nutalii</i>	5
<i>cragaegus douglasii</i>	1
<i>Lonicera involucrata</i>	10

<i>Mahonia aquafolium</i>	11
<i>philadelphus lewisii</i>	5
<i>Physocarpus capitatus</i>	5
<i>Quercus garryana</i>	1
<i>Rosa palustris</i>	14
<i>Spiraea douglasii</i>	76

### **Photo monitoring**

A total of 26 photo monitoring points have been established at the Butler Mitigation Bank. The date when the first photo was taken for each of the points varies depending on what was happening at the site at that time. From 2014 on, we will try to take photos from all 26 photo points during the late spring or early summer each year. Map 2 shows the location of the photo points.

Map 2





**Photo Point 1-** 9/2012 Before seeding, planting, and closure of water control structure



**Photo Point 1-** 3/2014- After seeding, planting, closure of water control structure and one growing season.





**Photo Point 2-** 11/2012- Immediately after seeding, before planting.



**Photo Point 2-** 3/2014- After seeding and planting and one growing season.



**Photo Point 3-** 11/2012- Immediately after seeding, before planting.



**Photo Point 3-** 3/2014- After seeding and planting and one growing season.



**Photo Point 4-** 8/2012 Before seeding, planting, and installation of water control structure



**Photo Point 4-** 3/2014- After seeding, planting, closure of water control structure and one growing season.





**Photo Point 5-** 11/2012- Immediately after seeding, before planting.



**Photo Point 5-** 3/2014- After seeding, planting, closure of water control structure and one growing season.



**Photo Point 6-** 11/2012- Immediately after seeding, before planting.



**Photo Point 6-** 3/2014- After seeding, planting, closure of water control structure and one growing season.



**Photo Point 7-** 11/2012- Immediately after seeding, before planting.



**Photo Point 7-** 3/2014- After seeding, planting, closure of water control structure and one growing season.



**Photo Point 8-** 4/2013- After seeding, during planting.



**Photo Point 8-** 3/2014- After seeding, planting and one growing season.





**Photo Point 9-** 6/2013- After seeding and planting.



**Photo Point 9-** 3/2014- After seeding and planting and one growing season.





**Photo Point 10- 12/2012-** After seeding and before planting.



**Photo Point 10- 3/2014-** After seeding and planting and one growing season.



**Photo Point 11-** 11/2012- After seeding and before planting.



**Photo Point 11-** 11/2012- After seeding, planting and one growing season.



**Photo Point 12-** 12/2012- After seeding, before planting west field.



**Photo Point 12-** 3/2014- After seeding and planting west field and after planting southern part of east field.



**Photo Point 13-** 12/2012- Before planting east field.



**Photo Point 13-** 3/2014- After planting southern part of east field.





**Photo Point 14-** 12/2012- Before planting east field.



**Photo Point 14-** 3/2014- After planting southern part of east field.



**Photo Point 15-** 12/2012- After seeding and before planting west field.



**Photo Point 15-** 3/2014- After seeding and planting west field and one growing season.





**Photo Point 16-** 8/2012- East field before initiation of project.



**Photo Point 16-** 3/2014- East field immediately after planting of woody shrubs.



**Photo Point 17- 8/2012-** Southern portion of east field before initiation of project.



**Photo Point 17- 3/2014-** Southern portion of east field immediately after planting of woody shrubs.





**Photo Point 18-** 8/2012- Northern portion of east field before initiation of project.



**Photo Point 18-** 3/2014- Northern portion of east field after clearing of ground and before construction.



**Photo Point 19-** 3/2014- Northern portion of east field after clearing of ground and before construction. Photo taken from NE corner.



**Photo Point 20-** 3/2014- Northern portion of east field after clearing of ground and before construction. Photo taken from NW corner of project area.



**Photo Point 21-** 8/2012- Northern portion of east field before initiation of project. Photo taken from culvert.



**Photo Point 21-** 3/2014- Northern portion of east field after clearing of ground and before construction. Photo taken from NW corner on culvert.





**Photo Point 22-** 8/2012- Central/western portion of east field before initiation of project.



**Photo Point 22-** 3/2014- Central/western portion of east field after clearing of ground and before construction.



**Photo Point 23-** 8/2012- West field before initiation of project. Photo taken from east side of ditch.



**Photo Point 23-** 8/2012- West field after seeding and planting. Photo taken from east side of ditch



**Photo Point 24-** 8/2012- Looking towards west field after west field was seeded and water control structure closed.



**Photo Point 24-** 8/2012- Looking towards west field after west field was seeded, both fields planted.





**Photo Point 25- 8/2012-** Looking towards west field after west field was seeded and water control structure closed.



**Photo Point 25- 3/2014-** Looking towards west field after west field was seeded, both fields planted.



**Photo Point 26-** 12/2012- West field after seeding and before planting



**Photo Point 26-** 3/2014- West field after seeding, planting, and one growing season.



## Data Collected

Transect # 2										
Species		Plot #						% cover	% frequency	Native
Scientific Name	Common Name	1	2	3	4	5	6			
<i>Eleocharis ovatum</i>	Ovate spikerush	1	3					6.75	33.33333	yes
<i>Beckmannia syzigachne</i>	American sloughgrass	1						0.5	16.66667	yes
<i>Agrostis exarata</i>	Spike bentgrass	2		2	1	1		6	66.66667	yes
<i>Leersia oryzoides</i>	rice cutgrass	1						0.5	16.66667	yes
<i>Rorippa curvisiliqua</i>	Western yellow cress	2		2	1			5.5	50	yes
<i>trifolium repens</i>	white clover	2		1			1	3	50	no
<i>Downingia elegans</i>	elegant calicoflower	1	1		1			1.5	50	yes
<i>Polygonum sp.</i>	prostrate knotweed species	1						0.5	16.66667	unk.
<i>Juncus ensifolius</i>	daggerleaf rush	1						0.5	16.66667	yes
<i>Polygonum arenastrum</i>	prostrate knotweed	1		1	2			3.5	50	no
<i>Lotus purshianus</i>	spanish clover	1		2	2			5.5	50	yes
<i>Juncus bufonius</i>	Toad rush	3		1		1		7.25	50	yes
<i>Gnaphalium palustre</i>	Western marsh cudweed	2		1	1	1		4	66.66667	yes
<i>Microsteris gracilis</i>	Phlox species	1						0.5	16.66667	yes
<i>Alopecurus geniculatis</i>	water foxtail	2						2.5	16.66667	yes
<i>Scirpus validus</i>	softstem bullrush		1					0.5	16.66667	yes
<i>Alisma plantago-aquatica</i>	American water plantain		2					2.5	16.66667	yes
<i>lythrum portula</i>	spatula leaf loosestrife		1					0.5	16.66667	no
<i>Deschampsia elongata</i>	slender hairgrass			3	3	4	3	29.16667	66.66667	yes
<i>Deschampsia</i>	tufted hairgrass			1	2	2	1	6	66.66667	yes

<i>cespitosa</i>										
<i>Epilobium densiflorum</i>	denseflower willow herb			2	2	1		5.5	50	yes
<i>Grindelia integrifolia</i>	willamette valley gumweed			1	2			3	33.33333	yes
<i>Epilobium sp.</i>	unk. willow herb species			1				0.5	16.66667	unk.
<i>Lactuca muralis</i>	wall lettuce			1				0.5	16.66667	no
<i>Hordeum brachyantherum</i>	meadow barley				1	1	2	3.5	50	yes
<i>Echinochloa crus-galli</i>	barnyard grass				1			0.6	16.66667	no
<i>Prunella vulgaris</i>	common self heal						2	2.5	16.66667	yes
<i>Sidalcea campestris</i>	meadow checkerbloom						1	0.5	16.66667	yes
<i>Ranunculus occidentalis</i>	western buttercup						1	0.5	16.66667	yes
<i>Bare soil</i>				1	1		1	1.5	50	x
<i>% Native Cover</i>	94.66666667									
<i>% non-native cover</i>	8.6									
<i>% bare ground</i>	1.5									

<b>Transect # 3</b>									
<b>Species</b>		<b>Plot #</b>					<b>% cover</b>	<b>% frequency</b>	<b>Native</b>
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>			
<i>Sagittaria latifolia</i>	Wapato	1					0.6	20	yes
<i>Alopecurus geniculatis</i>	water foxtail	1					0.6	20	yes
<i>Alisma plantago-aquatica</i>	American water plantain	4	2	2			18.5	60	yes
<i>Eleocharis ovatum</i>	Ovate spikerush	2	2	2			9	60	yes
<i>Downingia elegans</i>	elegant calicoflower	1	2	4			16.1	60	yes
<i>lythrum portula</i>	spatula leaf loosestrife	3		1	1		8.7	60	no
<i>trifolium repens</i>	white clover				1	1	1.2	40	no
<i>Hordeum</i>	meadow barley				1	2	3.6	40	yes

<i>brachyantherum</i>									
<i>Rorippa curvisiliqua</i>	Western yellow cress				2	3	20	yes	
<i>Grindelia integrifolia</i>	willamette valley gumweed				2	3	20	yes	
<i>Lotus purshianus</i>	spanish clover				2	3	20	yes	
<i>Gnaphalium uliginosum</i>	Marsh cudweed				2	3	20	yes	
<i>Montia linearis</i>	springbeauty				2	3	20	yes	
<i>Epilobium densiflorum</i>	denseflower willow herb				1	0.6	20	yes	
<i>Deschampsia cespitosa</i>	tufted hairgrass				1	2	3.6	40	yes
<i>Deschampsia elongata</i>	slender hairgrass				2	2	6	40	yes
<i>Agrostis exarata</i>	Spike bentgrass				1	0.6	20	yes	
<i>plagiobothrys scouleri</i>	popcorn flower				1	0.6	20	yes	
<i>Panicum L.</i>	Panic grass				1	0.6	20	unk.	
<i>Juncus bufonius</i>	Toad rush				1	0.6	20	yes	
<i>Scirpus validus</i>	softstem bullrush		1			0.6	20	yes	
<i>Prunella vulgaris</i>	common self heal					1	0.6	20	yes
<i>Daucus carota</i>	queen annes lace					1	0.6	20	no
<i>Bare soil</i>			4			2	15.5	40	x
<i>% Native Cover</i>	76.6								
<i>% non-native cover</i>	11.1								
<i>% bare ground</i>	15.5								

Transect # 4								
Species		Plot #				% cover	% frequency	Native
Scientific Name	Common Name	1	4	5	6			
<i>Scirpus validus</i>	softstem bullrush	1				0.75	25	yes

<i>Eleocharis ovatum</i>	Ovate spikerush	5	1		22.625	50	yes		
<i>Alisma plantago-aquatica</i>	American water plantain	2	3		13.125	50	yes		
<i>Leersia oryzoides</i>	rice cutgrass	1			0.75	25	yes		
<i>Downingia elegans</i>	elegant calicoflower	3	3		18.75	50	yes		
<i>Lythrum portula</i>	spatula leaf loosestrife	3	1		10.125	50	no		
<i>Alopecurus geniculatis</i>	water foxtail	1			0.75	25	yes		
<i>Deschampsia elongata</i>	slender hairgrass			4	3	25	50	yes	
<i>Hordeum brachyantherum</i>	meadow barley			1	2	4.5	50	yes	
<i>Prunella vulgaris</i>	common self heal			1	1	1.5	50	yes	
<i>Gnaphalium uliginosum</i>	Marsh cudweed			1		0.75	25	yes	
<i>Polygonum arenastrum</i>	prostrate knotweed			1		0.75	25	no	
<i>Montia linearis</i>	springbeauty			1		0.75	25	yes	
<i>Kickxia elatine</i>	cancerwort			1		0.75	25	no	
<i>Deschampsia cespitosa</i>	tufted hairgrass			1		0.75	25	yes	
<i>Daucus carota</i>	queen annes lace					1	0.75	25	no
<i>Rorippa curvisiliqua</i>	western yellow cress					1	0.75	25	yes
<i>Rumex crispus</i>	curly dock					1	0.75	25	no
<i>Cirsium arvense</i>	canada thistle					2	3.75	25	no
<i>Sonchus asper</i>	sow thistle					1	0.75	25	no
<i>Potentilla gracilis</i>	slender cinquefoil					1	0.75	25	yes
% Native Cover		91.5							
% non-native cover		17.625							
% bare ground		0							

**Transect # 5**

Species		Plot #		% cover	% frequency	Native
Scientific Name	Common Name	1	3			
<i>Juncus bufonius</i>	Toad rush	5		43.75	50	yes
<i>Anthemis Cotula</i>	Dog fennel	1		1.5	50	no
<i>Leersia oryzoides</i>	rice cutgrass	2		7.5	50	yes
<i>Eleocharis ovatum</i>	Ovate spikerush	2	2	15	100	yes
<i>Downingia elegans</i>	elegant calicoflower	2	5	51.25	100	yes
<i>Alisma plantago-aquatica</i>	American water plantain	2	2	15	100	yes
<i>Agrostis exarata</i>	Spike bentgrass	2		7.5	50	yes
<i>Beckmannia syzigachne</i>	American sloughgrass	1		1.5	50	yes
<i>Juncus ensifolius</i>	daggerleaf rush	1		1.5	50	yes
<i>Kickxia elatine</i>	cancerwort	1		1.5	50	no
<i>Lotus purshianus</i>	spanish clover	1		1.5	50	yes
<i>Panicum L.</i>	Panic grass	1		1.5	50	unk.
% Native Cover		144.5				
% non-native cover		4.5				
% bare ground		0				

Transect # 6						
Species		Plot #		% cover	% frequency	Native
Scientific Name	Common Name	1	3			
<i>Anthemis Cotula</i>	Dog fennel	2		7.5	50	no
<i>Agrostis exarata</i>	Spike bentgrass	1		1.5	50	yes
<i>Kickxia elatine</i>	cancerwort	2		7.5	50	no
<i>Panicum L.</i>	Panic grass	1		1.5	50	unk.
<i>Eleocharis ovatum</i>	Ovate spikerush	1	5	45.25	100	yes

<i>Juncus bufonius</i>	Toad rush	2		7.5	50	yes
<i>Rorippa curvisiliqua</i>	Western yellow cress	1		1.5	50	yes
<i>plagiobothrys scouleri</i>	popcorn flower	1	1	3	100	yes
<i>Downingia elegans</i>	elegant calicoflower	1	2	9	100	yes
<i>Juncus ensifolius</i>	daggerleaf rush	2		7.5	50	yes
<i>Juncus patens</i>	spreading rush	1		1.5	50	yes
<i>lythrum portula</i>	spatula leaf loosestrife	1		1.5	50	no
<i>Gnaphalium palustre</i>	Western marsh cudweed	2		7.5	50	yes
<i>trifolium repens</i>	white clover	2		7.5	50	no
<i>Vicia sp</i>	vetch	1		1.5	50	no
<i>Montia sp.</i>	springbeauty		1	1.5	50	yes
<i>Bare soil</i>		3	2	26.25	100	x
<i>% Native Cover</i>		85.75				
<i>% non-native cover</i>		27				
<i>% bare ground</i>		26.5				

Transect # 1									% cover	% frequency	Native	
Species		Plot #										
Scientific Name	Common Name	1	2	3	4	5	6	7				
<i>Anthemis Cotula</i>	Dog fennel	1							0.428571	14.28571	no	
<i>Alisma plantago-aquatica</i>	American water plantain	1							0.428571	14.28571	yes	
<i>Potentilla gracilis</i>	slender cinquefoil	1	1						0.857143	28.57143	yes	
<i>Deschampsia elongata</i>	Slender hairgrass	2	2	3				2	11.78571	57.14286	yes	
<i>Grindelia integrifolia</i>	willamette valley gumweed	2	1	1					3	42.85714	yes	
<i>Hordeum brachyantherum</i>	meadow barley	3	2	3	3		3	2	25.71429	85.71429	yes	
<i>Prunella vulgaris</i>	common self heal		1	1					0.857143	28.57143	yes	

<i>Daucus carrota</i>	queen annes lace		1	1					0.857143	28.57143	no
<i>Trifolium repens</i>	white clover		1	3			1		6.214286	42.85714	no
<i>Deschampsia caespitosa</i>	Tufted hairgrass		1	2	2		2	1	7.285714	71.42857	yes
<i>Rumex crispus</i>	curly dock			1				2	2.571429	28.57143	no
<i>Agrostis exarata</i>	Spike bentgrass			2	1	4	1	2	14.07143	71.42857	yes
<i>Rumex salicifolius</i>	willow dock				1	1	2	1	3.428571	57.14286	yes
<i>Beckmannia syzigachne</i>	American sloughgrass				2	2			4.285714	28.57143	yes
<i>Downingia elegans</i>	elegant calicoflower						3	3	10.71429	28.57143	yes
<i>Rorippa curvisiliqua</i>	western yellow cress							1	0.428571	14.28571	yes
<i>Bare ground</i>		1		2	2	1	3	1	10.92857	85.71429	x

Transect # 2								% cover	% frequency	Native
Species		Plot #								
Scientific Name	Common Name	1	2	3	4	5	6			
<i>Deschampsia elongata</i>	Slender hairgrass	2		2	3	3		17.5	66.66667	yes
<i>Grindelia integrifolia</i>	willamette valley gumweed	1		1				1	33.33333	yes
<i>Hordeum brachyantherum</i>	meadow barley	2	3	3		2	4	27.91667	83.33333	yes
<i>Prunella vulgaris</i>	common self heal	1	3			1		3.5	50	yes
<i>Daucus carrota</i>	queen annes lace	1						0.5	16.66667	no
<i>Ranunculus occidentalis</i>	western buttercup	1	1					1	33.33333	yes
<i>Rorippa curvisiliqua</i>	western yellow cress		1		1	1	1	2	66.66667	yes
<i>Trifolium repens</i>	white clover		1		2	1		3.5	50	no

<i>Deschampsia caespitosa</i>	Tufted hairgrass	1	3	1	1	2	1	10.75	100	yes
<i>Gnaphalium palustre</i>	Western marsh cudweed		1					0.5	16.66667	no
<i>Alisma plantago-aquatica</i>	American water plantain			2	1	2	1	6	66.66667	yes
<i>Lotus corniculatus</i>	bird foot trefoil			2	1			3	33.33333	no
<i>Lactuca serriola</i>	Prickly lettuce				1			0.5	16.66667	yes
<i>Alopecurus geniculatus</i>	water foxtail				2		1	5	33.33333	yes
<i>Rumex crispus</i>	curly dock				1			0.5	16.66667	no
<i>Rumex salicifolius</i>	willow dock					1	2	3	33.33333	yes
<i>Downingia elegans</i>	elegant calicoflower					2	3	8.75	33.33333	yes
<i>Bare ground</i>		1	1			4	1	11.91667	66.66667	x



### Woody Plot Data

Habitat Type	Plot #	Species	Count	Low Vigor	Medium Vigor	High Vigor	Dead
Forested Wetlands	1	Spiraea douglasii	4		4		
		Crataegus douglasii	7	1	3	1	2
		Fraxinus latifolius	1		1		
Forested Wetlands	2	Spiraea douglasii	4		3		1
		Crataegus douglasii	5		2	1	2
		Fraxinus latifolius	6		3	3	
Forested Wetlands	3	Spiraea douglasii	8		3	1	4
		Fraxinus latifolius	4		2	1	1
Forested Wetlands	4	Rosa pisocarpus	8	2	6		
		Crataegus douglasii	3		3		
		Spiraea douglasii	7		3	1	3
Forested Wetlands	5	Fraxinus latifolius	5		2	3	
		Cornus sericea	6		1	4	1
		Spiraea douglasii	6	2	2		2
Forested Wetlands	6	Fraxinus latifolius	8	1	3	4	
		Cornus sericea	14	2	5	4	3
Forested Wetlands	7	Crataegus douglasii	4		1	3	
		Spiraea douglasii	24	2	11	8	3
		Rosa pisocarpus	4	2	2		

Habitat Type	Plot #	Species	Count	Low Vigor	Medium Vigor	High Vigor	Dead	Notes
Existing Riparian Forest	1	Symphoricarpus albus	50			50		
		Corylus cornuta	3			3		
		Acer circinatum	1			1		
		Acer macrophyllum	5			5		
		Rosa pisocarpus	2			2		
		Physocarpus capitatus	7			7		
Existing Riparian Forest	2	Symphoricarpus albus	92			92		
		Mahonia aquifolium	2			2		
		Physocarpus capitatus	4			4		
		Acer circinatum	2			2		
		Corylus cornuta	8			8		
Existing Riparian Forest	3	Oemleria cerasiformis	11			11		
		Symphoricarpus albus	6			6		
		Abies grandis	1			1		
		Mahonia aquifolium	7			7		
		Corylus cornuta	4			4		
Existing Riparian Forest	4	Symphoricarpus albus	72			72		

		Mahonia aquifolium	18			18		
		Physocarpus capitatus	7			7		
		Cornus sericea	5			5		
		Acer circinatum	2			2		
		Acer macrophyllum	3			3		
		Corylus cornuta	9			9		
Existing Riparian Forest	5	Acer Ccincinatum	2			2		
		Symphoricarpus albus	26			26		
		Corylus cornuta	15			15		
		Prunus virginiana	4			4		
		Taxus brevifolium	1				1	
		Thuja plicata	1			1		
		Mahonia aquifolia	2			2		
Existing Riparian Forest	6	Quercus garryana	6			6		
		Symphoricarpus albus	7			7		
		Philadelphus lewisii	2			1	1	
		Amelanchier alnifolia	7			7		
		Corylus cornuta	6			6		
		Physocarpus capitatus	2			2		
Existing Riparian Forest	7	Symphoricarpus albus	22			22		
		Acer macrophyllum	1			1		
		Crataegus douglasii	4			4		

		Amelanchier alnifolia	2			2		
		Physocarpus capitatus	6			6		
		Lonicera involucrata	5			5		
Existing Riparian Forest	8	Cornus sericea	18			18		some live blackberry still, bare ground where sprayed
		Symphoricarpus albus	10			10		
		Creteagus douglasii	8			8		
		Fraxinus latifolium	2			2		
Existing Riparian Forest	9	Fraxinus latifolia	2			2		20% bare ground due to blackberry spraying
		Cornus sericea	3			3		
		Physocarpus capitatus	4			2	2	
		Sambucus racemosa	2			2		
Existing Riparian Forest	10	Crataegus douglasii	7			7		
		Oemleria cerasiformus	1			1		
		Corylus cornuta	1			1		
		Fraxinus latifolia	1			1		
		Physocarpus capitatus	4			4		
		Thuja plicata	1			1		

Habitat Type	Plot #	Species	Count	Low Vigor	Medium Vigor	High Vigor	Dead
New Riparian Forest	1	Mahonia aquifolium	8		8		
		Acer circinatum	2		2		
		Sambucus caerulea	2	2			

		Pinus ponderosa	1			1	
		Crataegus douglasii	1			1	
New Riparian Forest	2	Abies grandis	2			2	
		Acer circinatum	4			4	
		Sambucus caerulea	1				1
		Philadelphus lewisii	1		1		
		Rubus parviflorus	2		1		1
New Riparian Forest	3	Fraxinus latifolium	13	1	7	4	1
		Cornus sericea	6	1		5	
		Crataegus douglasii	4		1	3	
New Riparian Forest	4	Pinus ponderosa	1			1	
		philadelphus lewisii	5			5	
		Crataegus douglasii	5		3	2	
		Salix	1			1	
		Cornus sericea	5		2	3	
New Riparian Forest	5	Cornus sericea	3			3	
		Acer circinatum	4	1		3	
		Fraxinus latifolium	5	1	1	3	
		Quercus garryana	2			2	
		Philadelphus lewisii	5	1	2	2	
New Riparian Forest	6	Holodiscus discolor	4	1		3	
		Abies grandis	1			1	
		Mahonia aquifolium	4		1	3	
		Pseudotsuga menziesii	1	1			
		Cornus sericea	4		1	3	
New Riparian Forest	7	Cornus sericea	1		1		
		Mahonia aquifolium	1		1		

		Holodiscus discolor	2		2		
		Acer macrophyllum	1			1	
		Sambucus caerulea	2	1			1
		Acer circinatum	2		1	1	
		Fraxinus latifolium	1			1	
New Riparian Forest	8	Crataegus douglasii	1		1		
		Cornus sericea	1			1	
		Sambucus caerulea	1				1
		Spiraea douglasii	2			2	
New Riparian Forest	9	Pinus ponderosa	1	1			
		Spiraea douglasii	9	1	2	6	
		Cornus sericea	4		2	2	
New Riparian Forest	10	Pinus ponderosa	2		1	1	
		Acer circinatum	4		1	3	
		Crataegus douglasii	6	1	2	3	
		Acer macrophyllum	2		2		
		Philadelphus lewisii	2		1	1	

Habitat Type	Plot #	Species	Count	Low Vigor	Medium Vigor	High Vigor	Dead
Scrub Shrub Buffer	1	Spiraea douglasii	20	4	7	9	
		Quercus garryana	1			1	
		Lonicera involucrata	3		3		
		Physocarpus capitatus	2			2	
Scrub Shrub Buffer	2	Spiraea douglasii	17	2	8	7	
		Rosa palustris	5		2	3	
		Lonicera involucrata	3		2	1	

		Physocarpus capitatus	3		2	1	
Scrub Shrub Buffer	3	Spiraea douglasii	15	3	3	9	
		Rosa palustris	4	2	2		
		Mahonia aquafolium	11			11	
		cragaegus douglasii	1			1	
		Cornus nutallii	1		1		
Scrub Shrub Buffer	4	Spiraea douglasii	18	6		12	
		cornus nutalii	3	3			
		rosa palustris	2		2		
		philadelphus lewisii	5	1	3	1	
		lonicera involucrata	4		2	2	
Scrub Shrub Buffer	5	Spiraea douglasii	6		3	3	
		rosa palustris	3		1	2	
		cornus nutalii	1			1	

