# *Mitigation Monitoring Annual Report Template*

## 1. Mitigation Monitoring Report Cover Sheet

**1: *Project Name* W&M Butler Farm Mitigation Bank Identifiers:**

DSL Permit # 46986 Corps Permit # 46986- RF Permittee: Wes and Marybell Butler Farm LLC
County- Washington Report Date: 11-15-2016 Monitoring Year : 1 2 3 **4** 5
Date Removal-Fill Activity Completed: 9/2012, 7/3013, 9/2014, 10/2015.
Date mitigation was completed: Grading 9/2012, 7/3013, 9/2014, 10/2015
Planting 12/2012, 3/2013, 3/2014, ongoing
Date(s) of data collection: 5/15- 6/30/2016
Report prepared by: Nicole Ruggiero, Ash Creek Forest Management

**2: Monitoring Report Purpose:**

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

- ❑ Compensatory **freshwater, non-tidal** wetland mitigation for permanent wetland impacts.
- ❑ Compensatory **estuarine** wetland mitigation for permanent wetland impacts.
- ❑ **Only non-wetland** compensatory mitigation.
- ❑ **Only** mitigation for **temporary** impacts that had a monitoring requirement.
- ❑ **Voluntary** wetland enhancement, creation or restoration (General authorization or individual permit) not funded with money from DSL's wetland mitigation fund.
- ❑ Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) funded with money from DSL's **wetland mitigation fund**.
- **X** **Mitigation Bank** Report
- ❑ Other _____

**3: Results:** *(add more rows if needed)*

| | Performance standards (verbatim from permit) | | Fully Met? (Y/N) | Comments/Reason for shortfall (mark NA if doesn't apply this year) |
|---|---|---|---|---|
| 1. | Herbaceous wetlands- native species cover is > 60% | | Y | Average was 98% (+/- 3; 80% CI) |
| 2. | Herbaceous wetlands- invasive species cover is no more than 10% | | Y | Average was < 1%; *Phalaris arunidacea* was the only species. |
| 3. | Herbaceous wetlands- Bare substrate is no more than 20% | | Y | Average was 10% (+/- 3; 80% CI) |
| 4. | Herbaceous wetlands- After year 3, at least 10 different native species (defined as 5% cover or occur in 10% of plots and have a prevalence index < 3) | | Y | Only 8 species met these criteria to be considered in the native index, however there is significant diversity represented on-site and this performance standard is truly flawed. See report for more information. |
| 5. | Non-grass species must comprise at least 30% of total vegetative cover. | | Y | Non-grass cover was 63% (+/- 4.2; 80% CI). |
| 6. | Shrub/Forested wetlands- native species cover is > 60% | Phase 1 | Y | Average was 83% (+/- 7.5; 80% CI) |
| | | Phase 2 | Y | Average was 60% (+/- 10; 80% CI) |
| 7. | Shrub/Forested wetlands- cover of | Phase 1 | Y | Average was 1.43%; *Phalaris arunidacea* was the only species. |

| | | | | |
|---|---|---|---|---|
| | invasive herbaceous species <10% | Phase 2 | N | Average was 39% (+/- 9; 80% CI) due to high levels of *Anthemis cotula* and other weeds in some plots |
| 8. | Shrub/forested wetlands- cover of invasive trees and shrub species is no more than 10% | Phase 1 | Y | No invasive trees or shrubs were noted |
| | | Phase 2 | Y | No invasive trees or shrubs were noted |
| 9. | Shrub/forested wetlands- Cover of bare substrate is no more than 20% | Phase 1 | Y | Bare ground cover was 11% (+/- 3; 80% CI) in Phase 1. |
| | | Phase 2 | Y | Bare ground cover was very low at an average of < 1%. |
| 10. | Shrub/Forested wetlands- By year 3, at least 6 different native woody species (defined as 5% cover or occur in 10% of plots and have a prevalence index < 3) | Phase 1 | N | 5 woody species met this criteria |
| | | Phase 2 | Y | 6 woody species met this criteria |
| 11. | Shrub/Forested wetlands- native shrub and tree stem density is $\geq$ 1600/acre | Phase 1 | Y | Density was 1960 (+/- 199; 80% CI) stems/acre in Phase 1 |
| | | Phase 2 | Y | Density was 4,078 (+/- 515; 80% CI) stems/acre in Phase 2 |
| 12. | Upland buffers- cover of native species is at least 60% | | Y | Average cover was 74% (+/- 15; 80% CI) |
| 13. | Upland buffers- cover of invasive species is no more than 10% | | Y | This was very low at < 1% |
| 14. | Upland buffers- stocking of woody plants $\geq$ 1,800 stems/acre | | Y | Density was 2540 (+/- 1692; 80% CI) stems/acre. |

**4: Further Actions:**

| | | |
|---|---|---|
| **Remedial work recommended** | Yes ☒ | No ☐ |
| **Deed Restriction or other protection instrument attached** | Yes ☐ | No ☒ |
| **Final Monitoring Report?** | Yes ☐ | No ☒ |
| **Requesting release or partial release of financial security?** | Yes ☐ | No ☒ |

Remedial actions recommended include ongoing weed maintenance and infill planting of bare root shrubs and trees in buffer and forested shrub wetlands as necessary to ensure density targets.

# W&M Butler Mitigation Bank Mitigation

**Permittee:** Jay Hoffman
**Monitoring and Report Completed by:** Ash Creek Forest Management
**Contact:** Nicole Ruggiero (nicole@ashcreekforestry.com)
or George Kral (gkral@ashcreekforestry.com)

**Year 4 of 5 for Phase 1, Year 1 of 5 for Phase 2**

## *2.* Plan Purpose and Overview

### A. Location.

The mitigation site is located at: Township 2S Range 2W, Tax Lot 2S2110000200, Latitude 45 degrees, 24' 38.55" N (45.410708) and Longitude 122 degrees, 54' 18.04" W (-122.905011). The bank is located at 22242 SW Scholls Ferry Road, near the city of Beaverton, Oregon.

### B. Mitigation goals and objectives.

The primary goals of the W&M Butler Mitigation Bank are to create, enhance, and restore emergent, scrub, and forested wetlands and to protect surrounding buffer areas. The project involves weed control, broadening of the riparian fringe with dense plantings of riparian forest and scrub species. The project has converted existing agricultural fields to a complex of emergent wetland, wet prairie, wetland and upland scrub, and wetland and riparian forest. Wetland restoration, enhancement, and creation will generate wetland credits that will be used for compensatory mitigation for unavoidable impacts to waters of the Unites states or waters of the states that result from activities authorized under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, Oregon's Removal-Fill Law (ORS) 196.800-196.990 and OAR 141-085 or to resolve enforcement cases resulting from activities subject to these regulations. This mitigation project is intended to create the functions and values shown in Table 1. The project is broken into two phases. Table 1 shows the total expected results of both phases. Phase 1 is substantially complete, including all earthwork and structures, seeding and planting. Phase 2 work completed to date includes earthwork, grading, weed control, and initial seeding.

Table 1.

| Plant Community | TOTALS | Restoration | Enhancement | Creation | Buffers |
|---|---|---|---|---|---|
| PEM (emergent wetland and wet prairie) Acres | 47.01 | 13.80 | 12.80 | 21.40 | |
| PFO Acres | 6.54 | 3.50 | 0.69 | 2.40 | |
| PSS Acres | 2.70 | 1.68 | 0.19 | 0.81 | |
| Forested buffers | 14.20 | | | 33.70 | 33.70 |
| **TOTAL ACRES** | **90.97** | **18.98** | **13.68** | **24.61** | **33.70** |
| **Credit Ratio** | | 1:1 | 2:1 | 1.5:1 | 10:1 |
| **Credits Expected** | **TOTAL** | **Restoration** | **Enhancement** | **Creation** | **Buffers** |
| | 45.60 | 18.98 | 6.84 | 16.41 | 3.37 |

** Until the post-project delineation has been completed, fill in 'pending'.*

**C**. **Maintenance and management actions.**
In the past year, the following activities were conducted:

4/2016- 14,482 woody plants installed and 9 lbs. of native seed spread in Forested Wetland and Riparian Forest habitat types in Phase 1 and Phase 2.
4/2016- Spot spray along existing riparian buffer and emergent wetland in Phase 1 for thistle, reed canary grass, and blackberry.
5/2016- Grazed 10 acres of Phase 1 to remove thatch, and manage prairie (see more detail below).
6/2016- Boom sprayed Phase 2 to manage weeds and prepare for fall seeding.
6/2016- Hand-pulled and spot sprayed nonnative grasses and broadleaf weeds throughout project area.
7/2016- Buffer grass mow
9/2016- light cattle grazing to prep for seeding
10/2016- burned Phase 1 grazing area and Phase 2 for seeding prep
10-11/2016- seeded herbaceous species in the grazed area of Phase 1 (46 pounds) and native grasses and forbs in all of Phase 2 (700 pounds)
11/2016- boom sprayed Phase 2 to manage weeds

Grazing:
We used controlled, prescription cattle grazing to decrease thatch and biomass and create space for the introduction of broadleaf forbs to increase diversity. We created a fenced pasture and grazed 12 yearling cattle over approximately 10 acres of the established native prairie at Butler from May 17-June 21, 2016. This pasture included areas seeded and established as herbaceous wetland, but focused on more mesic prairie and excluded emergent wetland and most of the forested wetland areas. The grazing area is dominated by native prairie grasses and overall composed primarily of native herbaceous species.

We continuously monitored vegetation throughout the grazing period to assess and record species preferences and aversions, soil condition, and stubble height in order to adjust timing and move cattle as necessary. In addition, both grazed areas and a control area outside of the grazing area was monitored with 1 X 1 square meter vegetation plots. Using visual estimation from an aerial view of the plot, we assessed percent cover and percent grazed for each species, percent bare ground, and plant height (measured at the inner and outer corners). We repeated plots every other day during grazing and again after animals were removed.

We again introduced cattle for a week in September before seeding the grazing area with a diverse mix of broadleaf forbs. We intend to continue to monitor this area to understand the effects of the grazing and seeding success in the coming years.

**D**. **Monitoring methods**
Vegetation monitoring followed the same protocol as in previous reports following the routine methods specified in the DSL Removal-Fill Monitoring Guidelines with the following exceptions:

1. Vegetation monitoring only took place in the western half (Phase 1) of the project area due to the phased approach to the project implementation.

2. In order to achieve the required number of monitoring plots for the forested buffers within the existing transects, the distance between plots landing in forested buffers was half the distance as those within the emergent wetland areas.

3. The forested wetland acreage in the sampled western field is very small and narrow and would not have been adequately sampled in the transect layout in the rest of the project area. Therefore, a single transect was installed down the middle of the forested wetland in a direction perpendicular to those in the rest of the project area. The distance between

plots in this habitat type was 90 feet. This allowed for adequate sampling of this habitat type to achieve the minimum number of plots.

**E. Monitoring data locations**

Monitoring plot locations were repeat sampled using GIS and some existing permanent markers. New plots were added in the Riparian Forest area of Phase 2, as this was the first year that these were monitored. In the original set up as explained in the Mitigation Bank Instrument, a systematic sampling methodology was utilized in order to produce representative data and avoid bias. A permanent baseline has been established between two fixed points on the site. The first point is the center of a large marked oak tree, located 10 feet NE of transect 6 plot 1 (see map 3.0). The second point is the southwest corner of the water control structure, which is located approximately 60' NE of transect 6 plot 2 (see map 3.0). Transects are positioned perpendicular to this baseline, 265 feet apart. A random starting point between 0 and 25 is selected to determine the number of feet along the baseline west of the oak tree where the first transect should begin. Each subsequent transect is located 265 feet NE along the baseline from the last. Monitoring plots in the herbaceous wetland units are located 300 feet apart from each other, with the first point's number of feet from the baseline being determined by using a number randomly selected between 0 and 50. Each subsequent point is 300 feet along that transect until reaching forested buffers or until reaching the mitigation bank boundary. When forested buffers are encountered, the distance between monitoring plots was reduced to 150 feet. Herbaceous data was collected from two, one meter quadrants placed on the NW and SE corners of each plot. Tree and shrub data was collected in 30ft diameter circles around center of the plot.

| Habitat | Number of herbaceous plots | Number of woody plots |
|---|---|---|
| PEM | 34 | 0 |
| PFO | 12 | 6 |
| Planted Shrub/Forest Buffers | 8 | 4 |
| Existing Riparian Buffer | 16 | 8 |
| Phase 2 PFO | 18 | 9 |
| **TOTAL** | **88** | **27** |

# 3.Results

We sampled a total of 88, one meter square plots for herbaceous vegetation in the mitigation bank. Within these plots we detected a total of 72 species. Forty-three were native, 29 were non-native, only seven were invasive. This is an increase in number of native herbaceous species detected from 2015, and with a slightly different make up. Eleven native species and ten non-native species that were detected in 2016, were not detected in 2015. Overall, the balance between native to non-native species remains similar with 39 native and eighteen non-native species in the 2015 data increasing to 45 native and 28 non-native species in 2016. The vast majority of the vegetative cover in the plots was made up of native species. A total of 27 native and one non-native tree and shrub species were identified in the 2016 monitoring. This remains consistent with 2015.

The performance standards are reported on based on the Mitigation Bank Instrument and are more thoroughly adherent to the MBI than previously. Therefore, some slight changes in the format from previous reports is noted here, with more performance standards in 2016. Other changes include some reclassifying of plots based on vegetation and differences in treatment schedules. For example, the Forested Wetlands included some plots previously mapped as Upland Buffers due to the fact that vegetation matches more appropriately as Forested Wetlands. Additionally, Due to reclassifying some of these Upland Buffer plots and not including Existing Riparian Buffer in that stratum, the sample size for Upland Buffers is very small (4). More plots will be added in future monitoring.

## Herbaceous Wetlands

**Performance Standard 1.** The cover of native species is at least 60%

This standard was fully met. The average cover of native herbaceous species was 98% (+/- 1.5; 80% CI).

**Performance Standard 2.** The cover of invasive species is no more than 10%;

This standard was fully met. The average cover of invasive species was 0.6%. This was due to *Phalaris arundinacea* in one plot. These plants were treated after monitoring.

**Performance Standard 3**. Bare substrate represents no more than 20% cover;

This standard was fully met. The average cover of bare substrate was 10% (+/- 3; 80% CI).

**Performance Standard 4.** By Year 3 and thereafter, there are at least 10 different native species. 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 with a Prevalence Index < 3.

With a remarkable 43 native herbaceous species documented in the monitoring plots this season, we find the language of this standard flawed in its ability to measure diversity. In using those criteria, the standard was **not** fully met with only 8 different native species that meet these requirements. These were (in order from most cover): *Eleocharis palustris, Hordeum brachyantherum, Deschampsia cespitosa, Alisma plantago-aquatica, Scirpus validus, Juncus tenuis, Eleocharis acicularis,* and *Typha latifolia.*

Many other ecologically important wetland taxa were documented on monitoring plots, several at levels just below the standard. These include *Agrostis exarata*, *Beckmannia syzygachne*, *Carex unilateralis*, *Grindelia integrifolia*, *Juncus oxymeris*, *Leersia oryzoides*, *Rumex salicifolius*, and many others. It is easy to imagine how this level of diversity, where many taxa are present at low levels, defies the standard. At this point, with so many native species established and vying for space, the only way to achieve this standard would be to eliminate several native species and increase the prevalence of others. This would be contrary to the objectives of the project and is not recommended.

It is worth noting that a few other species met the criteria for diversity by cover or occurrence, but they had a higher Prevalence Index (*Danthonia californica, Prunella vulgaris*, and *Potentilla gracilis*). These species are regular inhabitants of wet prairie and are good additions to the diversity of the site, despite the fact that they can also occur in more upland settings. Overall, vegetation is highly diverse and appropriate for the site. We continue to add new species in our efforts to fill as many niches as possible. This work is over and above the requirements of this instrument.

**Performance Standard 5.** Non-grass species must comprise at least 30% of total vegetative cover.

This standard was fully met with 63% cover by non-grass species.

## Shrub Dominated and Forested Wetlands

**Performance Standard 6.** The cover of native herbaceous species is at least 60%.

**Phase 1:** This standard was fully met. The cover of native herbaceous species was 83% (+/- 3; 80% CI).

**Phase 2:** This standard was fully met. The cover of native herbaceous species was was 60% (+/- 10; 80% CI).

**Performance Standard 7.** 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%

**Phase 1:** This standard was fully met with the cover of invasive species was 1.43 % due to *Phalaris arundinacea* in one plot. Overall non-native cover was minimal.

**Phase 2:** This standard was not fully met. The average cover of invasive species was 39% (+/- 9; 80% CI) due to high levels of *Anthemis cotula* and other weeds in some plots.

**Performance Standard 8.** The cover of invasive shrub or tree species is no more than 10%

**Phase 1:**This standard was fully met. The cover of invasive shrub and tree species was 0%.

**Phase 2**: This standard was fully met. The cover of invasive shrub and tree species was 0%.

**Performance Standard 9.** Bare substrate represents no more than 20% cover

**Phase 1:** This standard was fully met. Bare substrate represented approximately 11% (+/- 3%; 80% CI) of the cover in these plots.

**Phase 2**: This standard was fully met. Bare ground cover was very low at an average of < 1%.

**Performance Standard 10.** By Year 3 and thereafter, there are at least 6 different native woody species providing 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 have a Prevalence Index of <3.

**Phase 1:** This standard is not met as woody species are still not providing enough cover to meet the native cover criteria and there were not enough woody species with a prevalence index less than 3 in the plots. There were 5 species that met the 10% sample criteria.

**Phase 2**: This standard is met with 6 species meeting the 10% sample criteria.

**Performance Standard 11.** The density of woody vegetation is at least 1,600 native plants (shrubs) and/or stems (trees) per acre (native species volunteering on the site may be included, dead plants/stems do not count).

**Phase 1:** The standard was fully met with an average density of 1,960 native stems/acre (+/- 155; 80% CI).

**Phase 2:** This standard was fully met with an average density of 4,078 (+/- 515; 80% CI) stems/acre.

## Upland Buffers

**Performance Standard 12.** The cover of native species is at least 60%

This standard is fully met for herbaceous species with 74% (+/- 12%; 80% CI) native cover, but the woody species do not yet provide enough cover to meet this standard.

**Performance Standard 13.** The cover of invasive 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%.

This standard was fully met. The average cover of invasive species was .88% due to *Phalaris arundinacea* in one plot.

## Existing Riparian Buffers

**Performance Standard 14.** In existing riparian stands, Himalayan blackberry will be reduced by a minimum of 80% to less than 5% of the total area, and treated areas replanted to initial stocking densities prior to the first credit release.

The standards for existing riparian buffers refer to the threshold of blackberry in the understory and have been met in years past. Therefore, we were asked to not include these plots in the

upland buffer stratum. We did sample these plots in 2016 previous to this decision and did find that blackberry remains under control, this area is still dominated by native species and meets density requirements. The data is attached in Table 6 of the appendices. These plots will not be sampled in future monitoring.

# 4. Conclusions and Recommendations

**A. Project status**

Phase 1:

As the trend has been over the past years, the mitigation project is in compliance with most performance standards as we move towards the final year of monitoring. Many similarities in cover, species, and density continue from the years past, with some improvements. For example, interplanting in the Forested Wetlands helped to increase density and bring this up to standards in 2016. Additionally, splitting out the Existing Riparian Forest Buffers from the planted Upland Buffers allowed for an improvement and meeting the standard for herbaceous cover in the Upland Buffers. Including the Existing Riparian Forest in these calculations in the past brought this average down due to the dominance by native shrubs in the understory in these areas.

The native herbaceous species cover in the wetland habitat types is exceedingly met, and overall has a large percentage of non-grass species (such as *Alisma plantago aquatica*, and *Eleocharis palustris*) The Mitigation Bank Instrument uses as diversity standard of 10 different native species. According to the current standard, the site fails to achieve diversity, but as discussed above, this results from dramatic exceedance of the standard, not lack of diversity. No remedial action is needed. We will, however, continue to add diversity with the use of grazing as a disturbance regime, followed by over-seeding with broadleaf species in the fall.

In 2014 we were concerned about higher rates of bare ground in the herbaceous wetland and shrub/forested wetland habitat types, but as expected, in 2015 and 2016 these areas were more heavily vegetated with native species.

In the shrub forested wetlands in 2015, we fell short of the performance standard for density. In early 2016, the inter-planting in these areas has brought this number up to standards. Overall stocking is high, and survival and growth achieve or exceed expected rates in woody habitats.

Overall, an absence of invasive species and low percentage of cover of non-native species, growth in diversity, decrease in bare ground, high coverage of native species and overall wetland health are notable advancements at Butler.

Phase 2:

This was the first year of monitoring for Phase 2. The 8 acres of Forested Wetlands were first planted several years ago and have been maintained and matured on the right trajectory. Further weed maintenance is needed to meet standards.

The remaining, approximately 30 acres, of Phase 2 were sprayed and prepared through the year for the extensive fall seeding. The goal in the next year will be the establishment of the herbaceous community before adding woody species to appropriate habitat areas in 2018.

**B. Recommendations**

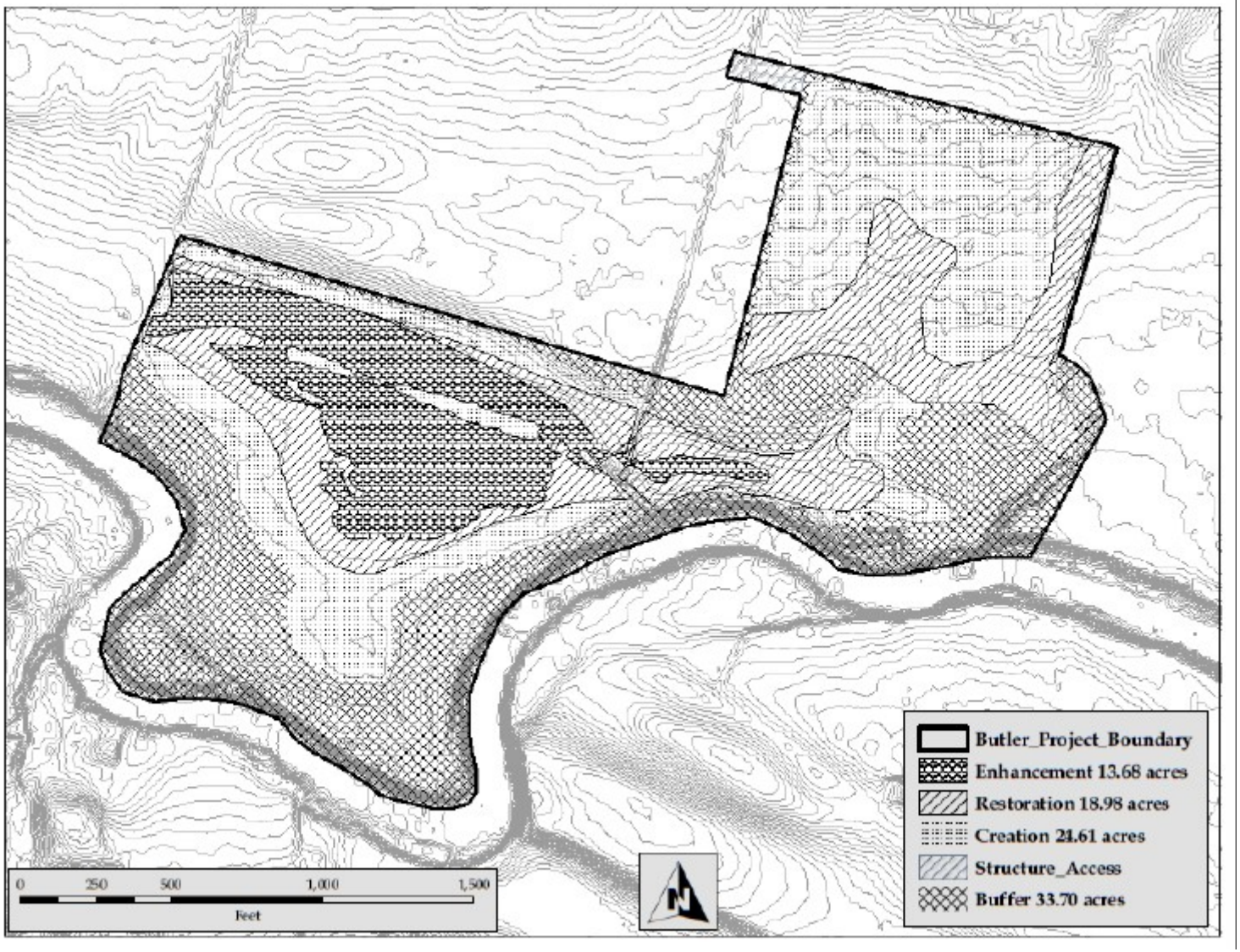
While non-native cover is low, continuing to aggressively control non-native species throughout the project area will be an important follow-up action over the coming year. The focus for this will be on Phase 2 in particular.

**C. Financial Security status**

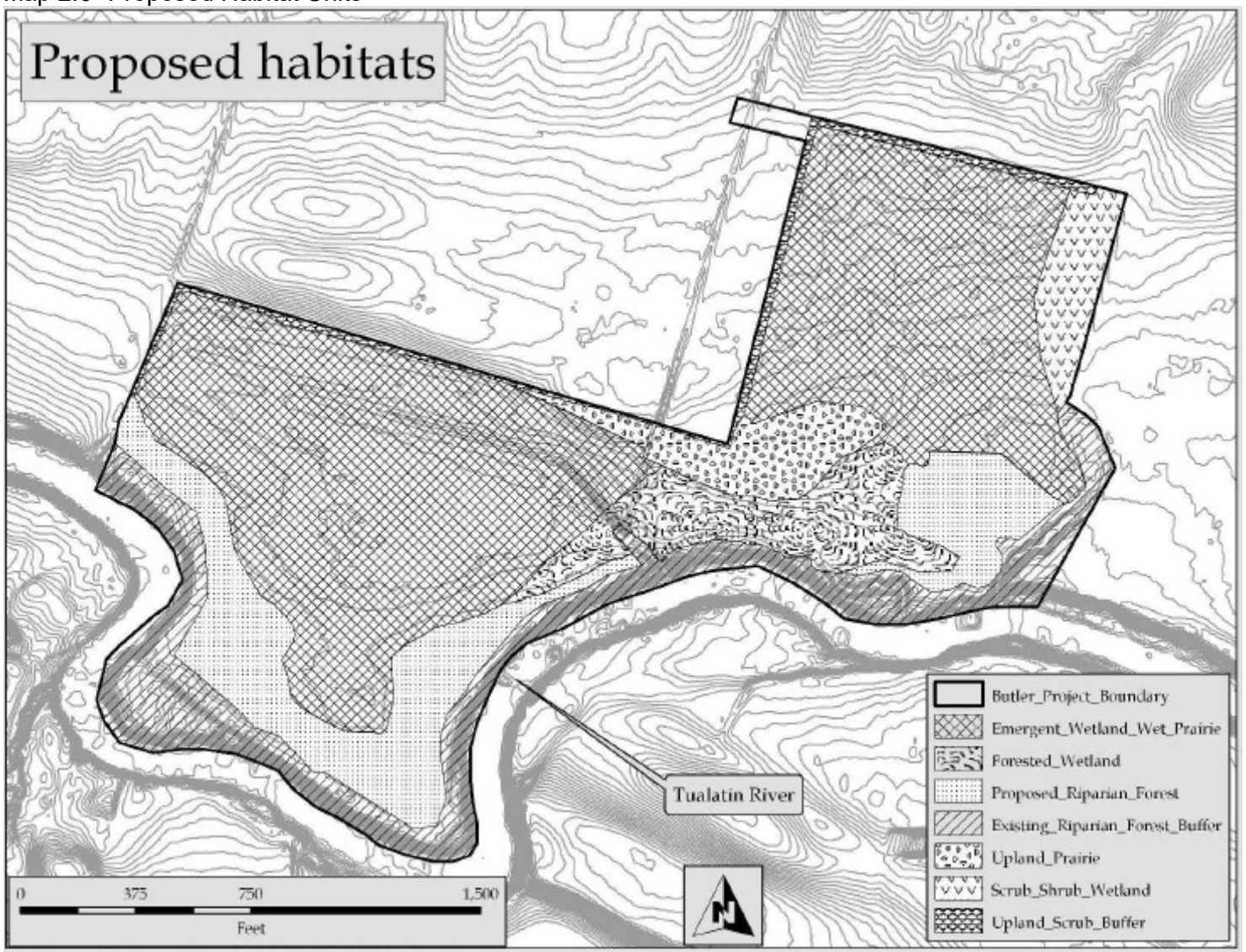
A (performance bond/ Letter of Credit/ other security) in the amount of $255,000 was established at permit issuance.  In February 2016 the bond was reduced to $45, 404 due to the project completion status.

## 5. Maps and Figures

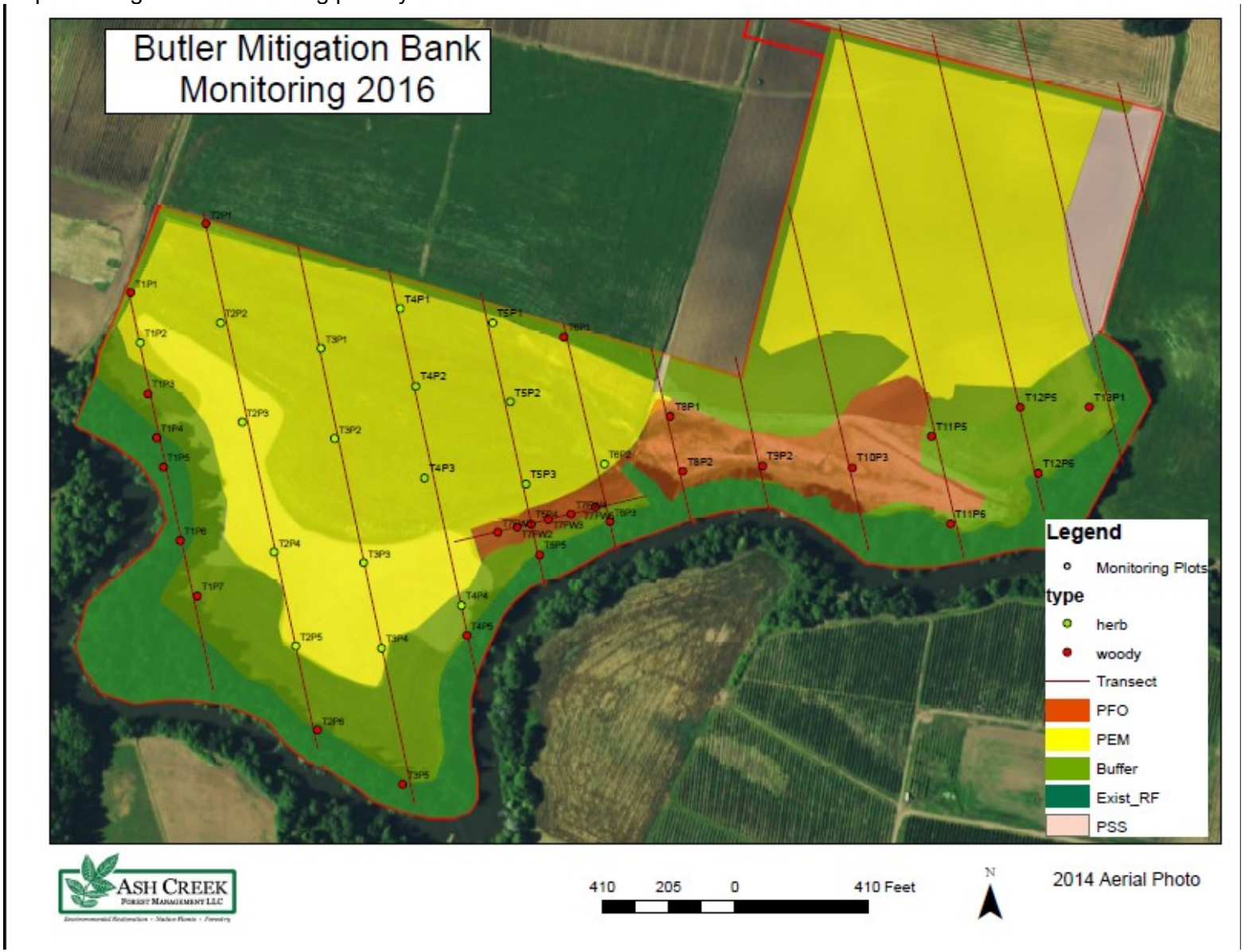
Map 1.0- Mitigation Plan



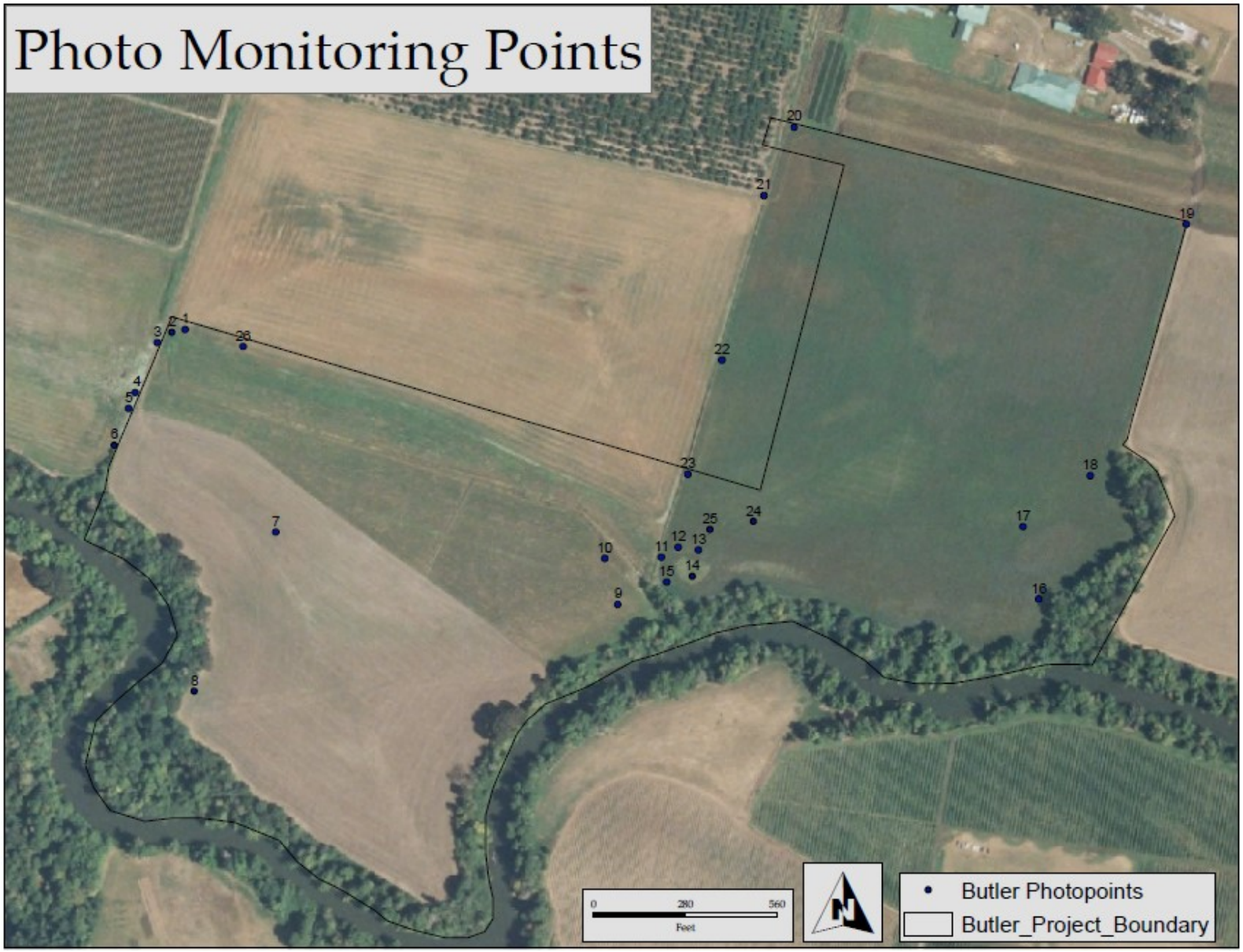
Map 2.0- Proposed Habitat Units



Map 3.0- Vegetation monitoring plot layout.



Map 4.0- Photo monitoring points



# 6. Appendices

Table 1- Baseline and transect layout details
Photo monitoring
Table 2. Data for Herbaceous Wetland Habitat Sampling Areas
Table 3. Data for Shrub Dominated and Forested Wetland Habitat Sampling Areas
Table 4. Data for Upland Buffer Habitat Sampling Areas
Table 5. Data for PFO and Buffer (Forested Wetlands/Riparian Forest) PHASE 2
Table 6. Data for Existing Riparian Forest PHASE 1

**Table 1. Baseline and Transect Layout Details**

| | Closest Feature/Plot | End/intersection | Longitude | Latitude |
|---|---|---|---|---|
| **Baseline** | Oak Tree | Western end | 122°54'36.45" W | 45°24'35.16"N |
| | Water Control Structure | Eastern End | 122°54'18.17" W | 45°24'37.85"N |
| **Transect 1** | Plot 6 | Baseline | 122°54'36.82" W | 45°24'35.14"N |
| **Transect 2** | Plot 4 | Baseline | 122°54'33.05" W | 45°24'35.64"N |
| **Transect 3** | Plot 3 | Baseline | 122°54'29.44" W | 45°24'36.21"N |
| **Transect 4** | Plot 3 | Baseline | 122°54'25.92" W | 45°24'36.69"N |
| **Transect 5** | Plot 3 | Baseline | 122°54'22.15" W | 45°24'37.20"N |
| **Transect 6** | Plot 2 | Baseline | 122°54'18.64" W | 45°24'37.68"N |
| **Transect 7** | Plot 3 | Transect 5 | 122°54'21.84" W | 45°24'36.47"N |

# Table 2. Data for Herbaceous Wetland Habitat Sampling Areas

| Site: W&M Butler Farms Mitigation Bank | Sample Date(s): | 5/9/2016-5/31/2016 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Herbaceous Wetland Habitat Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Transect/Plot number** | | | **t1p2a** | **t1p2b** | **t2p2a** | **t2p2b** | **t2p3a** | **t2p3b** | **t2p4a** | **t2p4b** | **t2p5a** | **t2p5b** | **t3p1a** | **t3p1b** | **t3p2a** | **t3p2b** | **t3p3a** | **t3p3b** | **t3p4a** | **t3p4b** | **t4p1a** | **t4p1b** | **t4p2a** | **t4p2b** | **t4p3a** | **t4p3b** | **t4p4a** | **t4p4b** | **t5p1a** | **t5p1b** | **t5p2a** | **t5p2b** | **t5p3a** | **t5p3b** | **t6p2a** | **t6p2b** | | | | | | |
| Species | Origin (N, NN, I) | Wetland Status (1 - 5) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | **24** | 25 | 26 | **27** | 28 | 29 | 30 | 31 | 32 | 33 | 34 | Row Average | Row Sums | frequency in plots | diversity | | |
| **Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Agrostis exarata* | N | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0.21 | 7 | 2 | | | | |
| *Alisma plantago aquatica* | N | 1 | 0 | 0 | 20 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 20 | 10 | 10 | 0 | 0 | 0 | 0 | 10 | 50 | 15 | 30 | 10 | 20 | 0 | 0 | 0 | 0 | 15 | 15 | 10 | 0 | 0 | 5 | 7.65 | 260 | 16 | 1 | | |
| *Beckmannia syzigachne* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | 30 | 2 | | | |
| *Bidens frondosa* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 5 | 1 | | | |
| *Carex stipata* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 5 | 1 | | | |
| *Carex unilateralis* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1.03 | 35 | 2 | | | |
| *Danthonia californica* | N | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 20 | 30 | 25 | 0 | 0 | 0 | 0 | 5 | 0 | 35 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.85 | 165 | 7 | | | |
| *Deschampsia cespitosa* | N | 2 | 20 | 20 | 0 | 0 | 98 | 90 | 20 | 50 | 30 | 35 | 0 | 0 | 0 | 0 | 60 | 75 | 30 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19.21 | 653 | 14 | 1 | | |
| *Eleocharis acicularis* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.47 | 50 | 4 | 1 | | |
| *Eleocharis palustris* | N | 1 | 0 | 0 | 40 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | 80 | 70 | 80 | 0 | 0 | 0 | 0 | 30 | 0 | 75 | 50 | 35 | 70 | 0 | 0 | 0 | 0 | 90 | 80 | 85 | 75 | 90 | 70 | 33.53 | 1140 | 17 | 1 | | |
| *Epilobium ciliatum* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.29 | 10 | 2 | | | |
| *Grindelia integrifolia* | N | 2 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | 30 | 2 | | | |
| *Hordeum brachyantherum* | N | 2 | 50 | 60 | 0 | 0 | 0 | 0 | 10 | 10 | 10 | 15 | 0 | 0 | 0 | 0 | 5 | 0 | 10 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 60 | 15 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 9.71 | 330 | 13 | 1 | | |
| *Juncus ensifolius* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 5 | 1 | | | |
| *Juncus oxymeris* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 1.18 | 40 | 2 | | | |
| *Juncus tenuis* | N | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 1.91 | 65 | 4 | 1 | | |
| *Leersia oryzoides* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0.74 | 25 | 3 | | | | |
| *Lotus purshianus* | N | 4 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.44 | 15 | 2 | | | |
| *Ludwigia palustris* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.38 | 115 | 2 | | | |
| *Potentilla gracilis* | N | 3 | 2 | 5 | 0 | 0 | 2 | 10 | 0 | 2 | 15 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.35 | 46 | 8 | | | |
| *Prunella vulgaris* | N | 4 | 5 | 10 | 0 | 0 | 0 | 0 | 40 | 20 | 15 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.82 | 130 | 8 | | | |
| *Ranunculus occidentalis* | N | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.59 | 20 | 2 | | | |
| *Rumex salicifolius* | N | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0.74 | 25 | 3 | | | |
| *Sagittaria latifolia* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.44 | 15 | 2 | | | |
| *Scirpus valetus* | N | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.21 | 75 | 4 | 1 | | |
| *Typha latifolia* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.88 | 30 | 4 | 1 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3326 | | 8 | | | |
| **Non-Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arrhenatherum elatius* | NN | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.29 | | | | | |
| *Leontodon taraxacoides* | NN | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.06 | | | | | |
| *Lemnoideae* | NN | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0.59 | | | | | |
| *Phalaris arundinacea* | I | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.06 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Bare Substrate** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *bare soil* | | | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 15 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 15 | 5 | 0 | 0 | 0 | 10 | 5 | 0 | 0 | 0 | 0 | 2.26 | | | | | |
| *thatch* | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.35 | | | | | |
| open water | | | 0 | 0 | 40 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 50 | 40 | 0 | 0 | 0 | 0 | 0 | 25 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 10 | 20 | 7.65 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Summary Information** | | | **1** | **2** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **Habitat Average** | | | | | |
| Cover of Native Herbaceous Species | | | 107 | 117 | 60 | 65 | 100 | 102 | 100 | 102 | 100 | 90 | 115 | 100 | 90 | 90 | 100 | 93 | 100 | 95 | 125 | 90 | 105 | 95 | 110 | 105 | 95 | 100 | 110 | 100 | 105 | 100 | 95 | 100 | 90 | 75 | 98 | | SD | | | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 96 | | 12.6129 | 8.66 | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 99 | | | | | |
| Cover of Invasive Herbaceous Species | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.06 | | | | | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | | | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | | | | |
| Bare Substrate | | | 5 | 2 | 40 | 35 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 10 | 50 | 40 | 10 | 15 | 0 | 5 | 0 | 25 | 5 | 5 | 0 | 15 | 7 | 0 | 0 | 10 | 10 | 5 | 5 | 10 | 10 | 20 | 10 | | SD | | | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7 | | 12.9144 | 4.472 | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 13 | | | | | |
| Cover of Non-Grass | | | 39 | 35 | 60 | 65 | 2 | 12 | 40 | 22 | 30 | 15 | 115 | 100 | 80 | 90 | 30 | 18 | 25 | 10 | 125 | 90 | 105 | 95 | 110 | 100 | 0 | 0 | 75 | 80 | 105 | 100 | 95 | 85 | 100 | 85 | 63 | | SD | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 38.9417 | 9.22 | | |
| Native Diversity | | | 3 | 7 | 3 | 4 | 6 | 8 | 5 | 4 | 6 | 4 | 5 | 4 | 5 | 4 | 5 | | | | | | | | | | | | | | | | | | | | 5 | | diversity index | | | |
| Prevalence Index | | | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2.13 | 2.19 | 1 | 1 | 1 | 1.05 | 1.11 | 1.13 | 2 | | | | | |
| Weighted Prevalence Index | | | 254 | 278 | 60 | 65 | 202 | 214 | 310 | 266 | 275 | 230 | 115 | 100 | 90 | 90 | 235 | 196 | 280 | 230 | 125 | 90 | 105 | 95 | 110 | 105 | 190 | 200 | 245 | 230 | 105 | 100 | 95 | 105 | 100 | 85 | 164 | | | | | |
| Sum of plant cover | | | 109 | 117 | 60 | 65 | 100 | 102 | 100 | 102 | 100 | 90 | 115 | 100 | 90 | 90 | 100 | 93 | 100 | 95 | 125 | 90 | 105 | 95 | 110 | 105 | 95 | 100 | 115 | 105 | 105 | 100 | 95 | 100 | 90 | 75 | 98 | | | | | |

# Table 3. Data for Shrub Dominated and Forested Wetland Habitat Sampling Areas

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Site: W&M Butler Farms Mitigation Bank** | **Sample Date(s): 5/9/2016** | | | | | | | | | | | | | | | | | | |
| **Shrub-Dominated and Forested Wetland Habitat Unit** | | **Percent Cover** | | | | | | | | | | | | | | | | | |
| | transect/plot number | | **t7fw1a** | **t7fw1b** | **t7fw2a** | **t7fw2b** | **t7fw3a** | **t7fw3b** | **t7fw4a** | **t7fw4b** | **t7fw5a** | **t7fw5b** | **T5P4a** | **T5P4b** | **T1P1a** | **T1P1b** | | | |
| Species | Origin (N, NN, I) | Wetland Status (1 - 5) | 1 | 2 | 3 | 4 | 9 | 10 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Row Average | Diversity | |
| **Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | |
| *Bidens frondosa* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 1.07 | | |
| *Danthonia californica* | N | 3 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.71 | | |
| *Deschampsia cespitosa* | N | 2 | 40 | 65 | 60 | 50 | 60 | 40 | 15 | 25 | 40 | 70 | 60 | 50 | 0 | 0 | 41.07 | | |
| *Eleocharis palustris* | N | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.36 | | |
| *Hordeum brachyantherum* | N | 2 | 35 | 30 | 35 | 45 | 20 | 30 | 60 | 70 | 40 | 20 | 35 | 50 | 0 | 60 | 37.86 | | |
| *Montia linearis* | N | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.36 | | |
| *Prunella vulgaris* | N | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | | |
| *Plagiobothrys figuratus* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 1.43 | | |
| *Plagiobothrys scouleri* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 10 | 1.21 | | |
| *Ranunculus occidentalis* | N | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.36 | | |
| | | | | | | | | | | | | | | | | | | | |
| **Non-Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | |
| *Anthemis cotula* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 5 | 0.50 | | |
| *Geranium disectum* | NN | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0.14 | | |
| *Holcus lanatus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0.71 | | |
| *Lotus corniculatus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 25 | 0 | 1.93 | | |
| *Phalaris arundinacea* | I | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 1.43 | | |
| *Rumex crispus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0.36 | | |
| *Sonchus asper* | NN | 3 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0.50 | | |
| *Trifolium repens* | NN | 3 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.71 | | |
| | | | | | | | | | | | | | | | | | | | |
| **Native Shrub and Tree Species** | | | count | cover | count | cover | count | cover | count | cover | count | cover | count | cover | count | cover | | frequency | |
| *Amalanchier alnifolia* | n | 4 | | | | | | | 1 | | | | | | | | | 1 | |
| *Crataegus douglasii* | N | 3 | 7 | | 1 | | | | 1 | | 1 | | 3 | | 2 | | | 6 | 1 |
| *Fraxinus latifolia* | N | 2 | 1 | | 3 | | 1 | | 1 | | | | 2 | | | | | 3 | 1 |
| *Mahonia aquifolium* | N | 4 | | | | | 2 | | | | | | 5 | | | | | 2 | |
| *Philadelphus lewisii* | N | 5 | 9 | | 3 | | 7 | | 5 | | 5 | | 1 | | | | | 6 | |
| *Physocarpus capitatus* | N | 2 | | | | | | | | | | | 1 | | | | | 1 | 1 |
| *Pinus ponderosa* | N | | | | | | | | | | | | 1 | | | | | 1 | |
| *Quercus garryana* | N | 4 | 2 | | 3 | | 1 | | 1 | | | | | | | | | 4 | |
| *Rosa pisocarpa* | N | 3 | | | 1 | | 10 | | 6 | | 6 | | | | | | | 4 | 1 |
| *Rubus leucodermis* | N | 4 | | | | | | | 2 | | | | | | | | | 1 | |
| *Sambucus cerulea* | N | 4 | | | 3 | | | | 1 | | | | | | | | | 2 | |
| *Spiraea douglasii* | N | 2 | 4 | | 1 | | | | 5 | | 4 | | | | 5 | 30 | | 5 | 1 |
| | | | | | | | | | | | | | | | | | | | |
| **Non-Native Shrub and Tree Species** | | | | | | | | | | | | | | | | | | | |
| *species-latin name* | | | | | | | | | | | | | | | | | #DIV/0! | | |
| | | | | | | | | | | | | | | | | | | | |
| **Bare Substrate** | | | 25 | 15 | 5 | 10 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 25 | 0 | 7 | | |
| **Litter** | | | | | | | 10 | 30 | | | 5 | 15 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Routine Performance Standards** | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **Habitat Average** | **Standard Dev** | **CI** |
| Cover of Native Herbaceous Species | | | 77 | 95 | 95 | 100 | 80 | 70 | 90 | 95 | 82 | 90 | 95 | 100 | 10 | 85 | 83 | 22.03846 | 7.548374 |
| Lower CI (80%) | | | | | | | | | | | | | | | | | 76 | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | 91 | | |
| Cover of Invasive Herbaceous Species | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 1.43 | 1 | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | 0 | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | 3 | | |
| Cover of Invasive Shrubs and Trees | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0 | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | 0 | | |
| Upper CI (80%) | | | | | | | | | | 91 | | | | | | | 0 | | |
| Cover of Native Species in Overstory | | | | | | | | | | | | | | | | | | #DIV/0! | |
| Bare Substrate | | | 25 | 15 | 5 | 10 | 10 | 30 | 5 | 5 | 5 | 15 | 0 | 0 | 25 | 0 | 11 | 3 | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | 7 | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | 14 | | |
| | | | 102 | 110 | 100 | 110 | 90 | 100 | 95 | 100 | 87 | 105 | 95 | 100 | 55 | 85 | | | |
| Native Diversity (all layers) | | | | | | | | | | | | | | | | | | N/A | |
| Prevalence Index--All strata | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | N/A | |
| Weighted Prevalence Index | | | 158 | 190 | 190 | 205 | 160 | 140 | 190 | 190 | 186 | 180 | 190 | 200 | 135 | 215 | 179 | | |
| Sum of plant cover | | | 100 | 95 | 120 | 95 | 106 | 70 | 108 | 95 | 111 | 90 | 108 | 100 | 72 | 125 | 99 | | |
| Density of Woody Vegetation | | Average per acre | 23 | | 15 | | 21 | | 23 | | 16 | | 13 | | 7 | | 17 | N/A | SD |
| | 118 | 19.66667 | | 2300 | | 1500 | | 2100 | | 2300 | | 1600 | | 1300 | | 2101 | 1960 | | 379.6617 |
| Plot is .01 acres, multiply by 100 | 100 | 1966.667 | | | | | | | | | | | | | | | 2115 | | |
| | | | | | | | | | | | | | | | | | 1805 | | 154.9962 |
| | | | | | | | | | | | | | | | | | | | CI |
| | | | | | | | | | | | | | | | | | | | 198.6357 |

## Table 4. Data for Upland Buffer Habitat Sampling Areas

| Site: W&M Butler Farms Mitigation Bank | Sample Date(s): 5/3/2016 - 5/30/2016 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Upland Buffer Habitat Unit** | | | | | | | | | | | | |
| **Transect/Plot number** | | | **T1P3A** | **T1P3B** | **T1P7A** | **T1P7B** | **T2P1A** | **T2P1B** | **T6P1A** | **T6P1B** | | |
| Species | Origin (N, NN, I) | Wetland Status (1 - 5) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Row Average | |
| **Native Herbaceous Species** | | | | | | | | | | | | |
| *Bidens frondosa* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0.63 | |
| *Danthonia californica* | N | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | |
| *Deschampsia cespitosa* | N | 2 | 10 | 0 | 20 | 20 | 0 | 0 | 0 | 0 | 6.25 | |
| *Epilobium ciliatum* | N | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | |
| *Grindelia integrifolia* | N | 2 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.75 | |
| *Hordeum brachyantherum* | N | 2 | 10 | 0 | 40 | 60 | 90 | 75 | 95 | 80 | 56.25 | |
| *Lotus purshianus* | N | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.63 | |
| *Phlox gracilis* | N | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.63 | |
| *Potentilla gracilis* | N | 3 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | 3.75 | |
| *Prunella vulgaris* | N | 4 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.88 | |
| *Ranunculus occidentalis* | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | |
| | | | | | | | | | | | | #REF! |
| **Invasive Herbaceous Species** | | | | | | | | | | | | |
| none | | | | | | | | | | | | |
| **Non-Native Herbaceous Species** | | | | | | | | | | | | |
| *Anthemis cotula* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | |
| *Holcus lanatus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | |
| *Leontodon taraxacoides* | NN | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.63 | |
| *Phalaris arundinacea* | I | 2 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | |
| *Rumex crispus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1.25 | |
| *Sonchus asper* | NN | 3 | 10 | 5 | 15 | 10 | 0 | 0 | 0 | 0 | 5.00 | |
| | | | | | | | | | | | | |
| ***Bareground*** | N | | 10 | 0 | 15 | 20 | 0 | 10 | 0 | 0 | 6.88 | |
| | | | | | | | | | | | | |
| **Native Shrub and Tree Species** | | | count | cover | count | cover | count | cover | count | cover | | |
| *Cornus serriola* | N | 2 | 2 | | | | | | | | | |
| *Crataegus douglasii* | N | 3 | 2 | | 2 | | 4 | | 1 | 20 | | |
| *Fraxinus latifolia* | N | 2 | 2 | | 2 | | | | | | | |
| *Lonicera involucrata* | N | 3 | 1 | | | | | | 3 | | | |
| *Mahonia aquifolium* | N | 4 | 6 | | 6 | | | | | | | |
| *Philadelphus lewisii* | N | 5 | | | 4 | 10 | | | | | | |
| *Physocarpus capitatus* | N | 2 | | | | | 1 | | | | | |
| *Populus trichocarpa* | N | 3 | | | | | 3 | | | | | |
| *Rosa pisocarpa* | N | 3 | | | | | 18 | | 4 | | | |
| *Rubus leucodermis* | N | 4 | | | 3 | | | | | | | |
| *Spiraea douglasii* | N | 2 | | | | | 50 | 30 | 55 | 70 | | |
| *Symphoricarpus albus* | N | 4 | 5 | 10 | | | | | | | | |
| | | | | | | | | | | | | |
| **Routine Performance Standards** | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **Habitat Average** | **Standard Dev** | **CI** |
| Cover of Native Herbaceous Species | | | 79 | 0 | 60 | 80 | 100 | 85 | 100 | 90 | 74 | 32.6 | 14.79296 |
| Lower CI (80%) | | | | | | | | | | | 32 | | |
| Upper CI (80%) | | | | | | | | | | | 116 | | |
| Cover of Invasive Herbaceous Species | | | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | 2 | 0.819073 |
| Lower CI (80%) | | | | | | | | | | | -1 | | |
| Upper CI (80%) | | | | | | | | | | | 3 | | |
| Cover of Native Shrubs and Trees | | | | 10 | | 10 | | 30 | | 90 | 35 | 18.9 | |
| Lower CI (80%) | | | | | | | | | | | 11 | | |
| Upper CI (80%) | | | | | | | | | | | 59 | | |
| | | | | | | | | | | | | | |
| unt of Native Shrubs and Trees | | | 18 | | 17 | | 76 | | 63 | | 174 | | SD |
| | | | 1800 | | 1700 | | 7600 | | 6300 | | 4350 | | 2640.549 |
| | | | | | | | | | | | | | |
| | | | 18 | | 17 | | 76 | | 63 | | 174 | | 1524.522 |
| Density of Woody Vegetation | | Average per acre | | | | | | | | | 43.5 | | CI |
| | | | | | | | | | | | 4350 | | 1692 |

# Table 5. Data for PFO (Forested Wetlands/Riparian Forest) PHASE 2

| **Site: W&M Butler Farms Mitigation Bank** | **Sample Date(s):** | 5/31, 6/27 and 6/28/2016 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Riparian Forest Phase 2** | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | | |
| **Transect/Plot number** | | | T8P1a | T8P1b | **T8P2A** | **T8P2B** | **T9P2a** | **T9P2b** | **T10P3A** | **T10P3B** | **T11P5A** | **T11P5B** | **T11P6A** | **T11P6B** | **T12P5A** | **T12P5B** | **T12P6a** | **T12P6B** | **T13P1A** | **T13P1B** | | |
| Species | Origin (N, NN, I) | Wetland Status (1 - 5) | | | | | | | | | | | | | | | | | | | Row Average | |
| **Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | | | | |
| *Agrostis exarata* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 40 | 20 | 10 | 20 | 20 | 15 | 7.50 | |
| *Bidens frondosa* | N | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.28 | |
| *Carex scoparia* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.44 | |
| *Deschampsia cespitosa* | N | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 50 | 0 | 0 | 60 | 80 | 30 | 10 | 80 | 75 | 25.28 | |
| *Downingia elegans* | N | 1 | 0 | 0 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.83 | |
| *Eliocharus palustris* | N | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.11 | |
| *Epilobium ciliatum* | N | 2 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 40 | 15 | 0 | 0 | 4.17 | |
| *Gnaphalium palustre* | N | 2 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.67 | |
| *Grindelia integrifolia* | N | 2 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | |
| *Hordeum brachyantherum* | N | 2 | 0 | 2 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.94 | |
| *Juncus bufonious* | N | 2 | 5 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.83 | |
| *Lotus purshianus* | N | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.56 | |
| *Plagiobothrys scouleri* | N | 2 | 25 | 30 | 40 | 40 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.78 | |
| *Psilocarphus elatior* | N | 2 | 5 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.72 | |
| *Rorippa curvisiliqua* | N | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.56 | |
| *Rumex salicifolius* | N | 2 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.56 | |
| *Trillium ovatum* | N | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.11 | |
| *Veronica americana* | N | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.28 | |
| | | | | | | | | | | | | | | | | | | | | | | |
| ***Bareground*** | N | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.83 | |
| | | | | | | | | | | | | | | | | | | | | | | |
| **Non-Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | | | | |
| *Agrostis capillaris* | I | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 30 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 5 | 0 | 5.28 | |
| *Anthemis cotula* | I | 3 | 0 | 5 | 30 | 25 | 70 | 80 | 0 | 0 | 0 | 0 | 65 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 19.17 | |
| *Cirsium sp.* | I | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.28 | |
| *Convolvulus arvensis* | I | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.83 | |
| *Daucus carota* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.56 | |
| *Geranium disectum* | NN | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0.56 | |
| *Holcus lanatus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.56 | |
| *Hypochaeris radicata* | NN | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 20 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2.78 | |
| *Kickxia elatine* | NN | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.56 | |
| *Lapsana (Nipplewort)* | NN | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0.56 | |
| *Leontodon taraxacoides* | I | 4 | 60 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.06 | |
| *Lolium perenne* | I | 3 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 25 | 20 | 0 | 0 | 0 | 30 | 0 | 0 | 4.72 | |
| *Misopates orontium* | NN | 5 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.83 | |
| *Myosotis scorpioides* | NN | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.28 | |
| *Polygonum aviculare* | NN | 3 | 0 | 0 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.83 | |
| *Raphanus Raphanistrum* | NN | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 20 | 0 | 0 | 0 | 1.78 | |
| *Rubus armeniacus (HBB)* | I | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0.56 | |
| *Rumex crispus* | NN | 3 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0.83 | |
| *Sonchus asper* | NN | 3 | 0 | 0 | 2 | 0 | 10 | 10 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.50 | |
| *Trifolium pratense* | NN | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.11 | |
| *Trifolium repens* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | |
| *Verbascum blattaria* | NN | 3 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.28 | |
| | | | | | | | | | | | | | | | | | | | | | | |
| **Native Shrub and Tree Species** | | | count | | count | | count | | count | | count | | count | | count | | count | | count | | | count |
| *Abies grandis* | N | 4 | | | | | | | | | | | | | | | | | | | | 0 |
| *Acer circinatum* | N | 3 | | | | | | | | | | | | | | | | | | | | 0 |
| *Cornus serriola* | N | 2 | 5 | | 3 | | 3 | | | | 10 | | 3 | | 2 | | 4 | | | | | 7 1 |
| *Crataegus douglasii* | N | 3 | | | | | | | | | 1 | | | | | | | | 2 | | | 2 |
| *Fraxinus latifolia* | N | 2 | | | 1 | | | | 5 | | | | 1 | | 2 | | 7 | | 3 | | | 6 1 |
| *Holodiscus discolor* | N | 4 | | | | | | | | | | | | | | | | | 1 | | | 1 |
| *Mahonia aquifolium* | N | 4 | | | | | 2 | | | | | | | | | | | | | | | 1 |
| *Oemleria cerasiformus* | N | 4 | | | | | | | | | 2 | | 1 | | | | | | | | | 2 |
| *Philadelphus lewisii* | N | 5 | | | | | | | | | | | | | | | | | | | | 0 |
| *Physocarpus capitatus* | N | 2 | | | | | 10 | | | | 1 | | 5 | | 1 | | | | 3 | | | 5 1 |
| *Quercus garryana* | N | 4 | | | | | 1 | | | | | | | | 3 | | 2 | | 1 | | | 4 |
| *Rosa pisocarpa* | N | 3 | 52 | | 15 | | 2 | | | | 17 | 30 | 5 | | 12 | | 15 | 15 | | | | 9 |
| *Salix lucida* | N | 2 | 1 | | | | 3 | | | | | | | | | | | | | | | 2 1 |
| *Salix scoulerii* | N | 3 | | | | | | | | | | | 2 | | | | | | | | | 1 |
| *Salix sitchensis* | N | 2 | | | 5 | | | | 8 | | | | | | | | | | | | | 2 1 |
| *Spiraea douglasii* | N | 2 | | | 22 | | 2 | | 41 | 10 | 11 | | 2 | | | | 3 | | 40 | | | 8 1 |
| *Symphoricarpus albus* | N | 4 | | | | | | | | | | | 2 | | | | 16 | | 6 | | | 3 |
| | | | | | | | | | | | | | | | | | | | | | **Habitat Average** | **Standard Error** |
| **Routine Performance Standards** | | | | | | | | | | | | | | | | | | | | | | |
| Cover of Native Herbaceous Species | | | 60 | 63 | 75 | 65 | 10 | 20 | 55 | 70 | 80 | 60 | 0 | 0 | 100 | 100 | 80 | 45 | 100 | 90 | 60 | 7.8 SD |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | | | 50 | 31.97766 |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | | | 70 | |
| Cover of Invasive Herbaceous Species | | | 65 | 90 | 30 | 25 | 75 | 80 | 50 | 35 | 0 | 5 | 100 | 100 | 0 | 0 | 10 | 30 | 5 | 0 | 39 | 9 7.755723 |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | | | 28 | CI |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | | | 50 | 9.65932 |
| Cover of Native Shrubs and Trees | | | | | | | | | | | | | | | | | | | | | | |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | | | | |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | | | | |
| total herbaceous sum | | | 125 | 153 | 105 | 90 | 85 | 100 | 105 | 105 | 80 | 65 | 100 | 100 | 100 | 100 | 90 | 75 | 105 | 90 | | SD |
| Count of Native Shrubs and Trees | | | 58 | | 46 | | 23 | | 54 | | 42 | | 21 | | 20 | | 47 | | 56 | | 41 | 1456.615 |
| Density | | | 5800 | | 4600 | | 2300 | | 5400 | | 4200 | | 2100 | | 2000 | | 4700 | | 5600 | | 4078 | |
| | | | | | | | | | | | | | | | | | | | | | 4593 | 514.9913 |

# Table 6. Data for Existing Riparian Forest PHASE 1

| Site: W&M Butler Farms Mitigation Bank | Sample Date(s): 5/6/2016 -5/30/2016 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Upland Buffer Habitat Unit** | | | | | | | | | | | | | | | | | | | |
| **Transect/Plot number** | | | **T1P4A** | **T1P4B** | **T1P5A** | **T1P5B** | **T1P6A** | **T1P6B** | **T2P6A** | **T2P6B** | **T3P5A** | **T3P5B** | **T4P5A** | **T4P5B** | **T5P5A** | **T5P5B** | **T6P3A** | **T6P3B** | |
| Species | Origin (N, NN, I) | Wetland Status (1 - 5) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Row Average |
| **Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | |
| *Carex deweyana* | N | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.63 |
| *Danthonia californica* | N | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0.31 |
| *Gallium aparine* | N | 4 | 0 | 0 | 0 | 0 | 5 | 15 | 15 | 5 | 15 | 5 | 0 | 5 | 0 | 0 | 5 | 0 | 4.38 |
| *Rubus ursinus* | N | 4 | 0 | 0 | 15 | 0 | 55 | 0 | 5 | 0 | 10 | 10 | 15 | 0 | 0 | 0 | 25 | 0 | 8.44 |
| *Tellima grandiflora* | N | 4 | 75 | 25 | 75 | 85 | 15 | 15 | 80 | 85 | 50 | 30 | 50 | 60 | 20 | 15 | 0 | 0 | 42.50 |
| *Viola glabella* | N | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.31 |
| | | | | | | | | | | | | | | | | | | | |
| *Bareground* | N | | 10 | 10 | 20 | 10 | 15 | 15 | 15 | 10 | 15 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 9.38 |
| | | | | | | | | | | | | | | | | | | | |
| **Invasive Herbaceous Species** | | | | | | | | | | | | | | | | | | | |
| none | | | | | | | | | | | | | | | | | | | |
| **Non-Native Herbaceous Species** | | | | | | | | | | | | | | | | | | | |
| *Alopecurus pratensis* | NN | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 40 | 10 | 0 | 5.00 |
| *Cirsium arvensis* | NN | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 15 | 0 | 0 | 2.19 |
| *Geranium disectum* | NN | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0.63 |
| *Lapsana communis* | NN | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.63 |
| *Leontodon taraxacoides* | NN | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 50 | 3.75 |
| *Lolium perenne* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 10 | 0 | 0 | 2.50 |
| *Lotus corniculatus* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 20 | 1.88 |
| *Poa annua* | NN | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 1.88 |
| *Vicia (Vetch)* | NN | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 1.88 |
| | | | | | | | | | | | | | | | | | | | |
| **Native Shrub and Tree Species** | | | count | cover | count | cover | count | cover | count | cover | count | cover | count | cover | count | cover | count | cover | |
| *Acer circinatum* | N | 3 | 2 | 40 | 10 | 100 | | | | | 2 | | | | | | 2 | | 30.80 |
| *Acer macrophylum* | N | 4 | 6 | 100 | 2 | 100 | 15 | 100 | 2 | 100 | | 20 | | | | 90 | | | 53.50 |
| *Amalanchier alnifolia* | N | 4 | | | | | 2 | | | | | | | | 2 | | | | 2.00 |
| *Cornus serriola* | N | 2 | 2 | | | | 1 | | 18 | 80 | 12 | 40 | 1 | 30 | 7 | | 4 | | 19.50 |
| *Corylus cornuta* | N | 4 | | | 4 | | | | | | 1 | | 1 | | | | | | 2.00 |
| *Crataegus douglasii* | N | 3 | | | | | | | | | | | 9 | 100 | 1 | | 2 | 100 | 42.40 |
| *Fraxinus latifolia* | N | 2 | 1 | | | | | | 1 | | 2 | | | | | | | | 1.33 |
| *Holodiscus discolor* | N | 4 | | | 7 | 40 | | | | | | | | | | | | | 23.50 |
| *Lonicera involucrata* | N | 3 | | | | | | | | | | | | | | | 7 | | 7.00 |
| *Mahonia aquifolium* | N | 4 | 10 | 40 | 3 | 10 | | | | | 10 | 20 | | | | | 1 | | 13.43 |
| *Oemleria cerasiformus* | N | 4 | | | 4 | | | | 3 | | 2 | 80 | | | | | | | 22.25 |
| *Philadelphus lewisii* | N | 5 | | | | | | | | | | | | | 1 | 10 | 1 | | 4.00 |
| *Physocarpus capitatus* | N | 2 | 11 | | | | 5 | | | | 2 | | 5 | | 10 | | 5 | | 6.33 |
| *Pseudotsuga menziesii* | N | 4 | | | | | | | 1 | | | | | | | | | | 1.00 |
| *Rosa pisocarpa* | N | 3 | 8 | 20 | | | | | | | | | 9 | 10 | 4 | | | | 10.20 |
| *Rubus leucodermis* | N | 4 | | | | | 2 | | | | | | | | | | | | 2.00 |
| *Rubus parviflorus* | N | 3 | 11 | | | | | | 1 | | 21 | 35 | | | | | | | 17.00 |
| *Rubus ursinus* | N | 4 | 5 | | | 15 | 20 | 50 | | | | | | | | | | | 22.50 |
| *Salix sitchensis* | N | 2 | | | | | | | 5 | 40 | | | | | | | | | 22.50 |
| *Symphoricarpus albus* | N | 4 | 40 | 35 | 55 | 100 | 35 | 30 | 1 | | 3 | | | | 20 | | 1 | | 32.00 |
| *Thuja plicata* | N | 3 | | | | | | | | | 1 | 100 | | | | | | | 50.50 |
| **Routine Performance Standards** | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **Habitat Average** |
| Cover of Native Herbaceous Species | | | 75 | 25 | 95 | 85 | 75 | 30 | 100 | 90 | 80 | 50 | 70 | 65 | 20 | 15 | 30 | 0 | 57 |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | 46 |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | 67 |
| Cover of Invasive Herbaceous Species | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 55 | 10 | 0 | 7 |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | 1 |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | 13 |
| Cover of Native Shrubs and Trees | | | | 235 | | 365 | | 180 | | 220 | | 295 | | 140 | | 100 | | 100 | 204 |
| Lower CI (80%) | | | | | | | | | | | | | | | | | | | 162 |
| Upper CI (80%) | | | | | | | | | | | | | | | | | | | 247 |
| | | | | | | | | | | | | | | | | | | | |
| unt of Native Shrubs and Trees | | | 96 | | 85 | | 80 | | 32 | | 56 | | 25 | | 45 | | 23 | | 55 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | Count | | | | | | | | |
| | | | 96 | | 85 | | 80 | | 32 | | 56 | | 25 | | 45 | | 23 | | 442 |
| Density of Woody Vegetation | | Average per acre | | | | | | | | | | | | | | | | | 55.25 |
| Plot Area (shrub/tree plot)= 1/100 acre | | | | | | | | | | | | | | | | | | plants/acre | 5525 |

Butler Photo points 2016

Photo point 1, June 2016

Photo point 2, June 2016

Photo point 3, June 2016

Photo point 4, June 2016

Photo point 5, June 2016

Photo point 6, June 2016

Photo point 7, June 2016

Photo point 8, June 2016

Photo point 9, June 2016

Photo point 10, June 2016

Photo point 11, June 2016

Photo point 12, June 2016

Photo point 13, June 2016

Photo point 16, June 2016

Photo point 17, June 2016

Photo point 19, June 2016

Photo point 20, June 2016

Photo point 21, June 2016

Photo point 22, June 2016

Photo point 23, June 2016

Photo point 24, June 2016